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# CONTENTS

# IS THE MATERNAL AGE A RISK FACTOR IN CAUSING GENETIC THROMBOPHILIC MUTATION?

**Melinda-Ildiko Mitranovici[1], Lucian Puscasiu[2], Marius Craina[3], Daniela Iacob[4], Lavinia Cristina Moleriu[5], Izabella Petre[3]**

**Abstract**

Thrombophilia are hereditary or acquired disorders that predispose to clot formation and venous thrombotic events, or thromboembolic disease, based on a variety of structural abnormalities in the fibrinogen molecule. In most studies thrombophilia are associated with an increased risk of fetal loss. This study was conducted in the Department of Obstetrics and Gynecology of the Emergency Clinic Hospital Municipal Deva. Regarding the typology, this study is a prospective cohort study, the patients being monitored for three years. In calculating the risk factors, we consider both risk ratio and odds ratio. For statistical significance test, we applied $\chi^2$ test for equality of proportions. From the database we have made contingency tables, one for each individual gene. The study of the risk ratio concludes that age is a risk/protective factor defining for the appearance of mutation, most likely this mutation might also occurring due to other risk factors than age.

**Keywords:** genetics, thrombophilia, gene, mutations.

**Introduction**

Thrombophilia are hereditary or acquired disorders that predispose to clot formation and venous thrombotic events, or thromboembolic disease, based on a variety of structural abnormalities in the fibrinogen molecule. In most studies thrombophilia are associated with an increased risk of fetal loss [1-8].

Pregnant women are investigated mostly for thrombophilia if there are diagnosed delayed growth of the fetus, changes in circulation tubes with increased blood circulation uterine on ultrasound power Doppler examination, increased blood pressure that can lead to extreme manifestations of eclampsia-preeclampsia and pathology of the placenta that is ultrasound detected with "premature aging of placenta" [9-17].

**Material and methods**

This study was conducted in the Department of Obstetrics and Gynecology of the Emergency Clinic Hospital Municipal Deva. We intended to identify mutations in pregnant women diagnosed with thrombophilia and Factor V Leiden, Factor V R2, Factor II, MTHFR, PAI, Factor XIII, EPCR - correlated with maternal age and the risk factors for the fetus in case of the occurrence of fetal thrombophilia. We considered risk factors analysis to see if the maternal age over 35 years may be regarded as a risk factor in the development of genetic mutations.

Regarding the typology, this study is a prospective cohort study, the patients being monitored for three years. In calculating the risk factors, we consider both risk ratio and odds ratio. For statistical significance test, we applied $\chi^2$ test for equality of proportions. Thus, from the database we have made nine contingency tables, one for each individually gene.

**Results and discussion**

Descriptive data and results are shown in Tables 1-9 and the conclusions for each case are detailed in the table description. In this follow up study we tasted to see if an age above 35 years can be considered as a main risk factors which can influence the appearance of some gene mutations during pregnancy. So, we gathered information from 40 patients. After running a risk analysis we obtained that the age can't be considered a risk factor. In some cases for some genes the age is a protective factor, but the differences are not significant from the statistical point of view. For the tested mutation we calculated both the risk ratio and the odds ratio.

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For the statistical significance we applied a $\chi^2$ test for proportions. We considered the level of confidence to be $\alpha = 0.05$. The only case where we obtained significant differences is for the MTHMR MTHFR C677T homo-mutation, where the age has a protective factor, the age has a positive influence ($p = 0.03$, $RR = 0.25, RR \in (0.06; 0.99)$, $OR = 0.17, OR \in (0.03; 0.92)$, see Table 5).

**Table 1:** Analysis of the risk of FV Leiden mutation homo-. In terms of the sample, the age over 35 years can be considered a protective factor risk (RR <1, OR <1) insignificant risk to the entire population from which is the study group (p> 0.05).

| Exposure vs Disease | Types of mutation | | Total | p - value<br>RR, 95%<br>OR, 95% |
|---|---|---|---|---|
| | F V homo+ | F V homo - | | |
| >= 35 years | 2 | 18 | 20 | $p = 0.38$<br>$RR = 0.5$,<br>$RR \in (0.11; 2.43)$<br>$OR = 0.44$,<br>$OR \in (0.07; 2.76)$ |
| < 35 years | 4 | 16 | 20 | |
| Total | 6 | 34 | 40 | |

**Table 2:** Analysis of the risk of FV Leiden mutation hetero-. In terms of the sample, the age over 35 years can be considered a risk factor (RR> 1, OR> 1), the risk is insignificant for the entire population from which is the study group (p> 0.05).

| Exposure vs Disease | Types of mutation | | Total | p - value<br>RR, 95%<br>OR, 95% |
|---|---|---|---|---|
| | F V hetero+ | F V hetero - | | |
| >= 35 years | 6 | 14 | 20 | $p = 0.73$<br>$RR = 1.2$,<br>$RR \in (0.44; 3.30)$<br>$OR = 1.29$,<br>$OR \in (0.32; 5.17)$ |
| < 35 years | 5 | 15 | 20 | |
| Total | 11 | 29 | 40 | |

**Table 3:** Analysis of the risk of F II mutation homo-. Leiden mutation homo, the risk is insignificant for the entire population from which is the study group (p> 0.05).

| Exposure vs Disease | Types of mutation | | Total | p - value<br>RR, 95%<br>OR, 95% |
|---|---|---|---|---|
| | F II homo+ | F II homo - | | |
| >= 35 years | 2 | 18 | 20 | $p = 0.38$<br>$RR = 0.5$,<br>$RR \in (0.11; 2.43)$<br>$OR = 0.44$,<br>$OR \in (0.07; 2.76)$ |
| < 35 years | 4 | 16 | 20 | |
| Total | 6 | 34 | 40 | |

In terms of the sample, the age over 35 years can be considered a protective risk factor (RR <1 or <1), analogous to FV

**Table 4**: Analysis of the risk of F II mutation homo-. In terms of the sample, the age over 35 years can be considered a protective risk factor (RR <1, OR <1), the risk is insignificant for the entire population from which is the study group (p> 0.05).

| Exposure vs Disease | Types of mutation | | Total | p - value<br>RR, 95%<br>OR, 95% |
|---|---|---|---|---|
| | F II hetero+ | F II hetero - | | |
| >= 35 years | 3 | 17 | 20 | $p = 0.58$<br>$RR = 0.75$,<br>$RR \in (0.19; 2.93)$<br>$OR = 0.71$,<br>$OR \in (0.14; 3.66)$ |
| < 35 years | 4 | 16 | 20 | |
| Total | 7 | 33 | 40 | |

**Table 5:** Analysis of the risk of MTHMR MTHFR C677T mutation homo-. In terms of the sample, the age over 35 years can be considered a protective risk factor (RR <1, OR <1), the risk is significant for the entire population from which is the study group (p <0.05). In terms of risk analysis conducted on this group, this is the only situation where the registered risk can be generalized to the entire population.

| Exposure vs Disease | Types of mutation | | Total | p - value RR, 95% OR, 95% |
|---|---|---|---|---|
| | MTHMR C677T homo + | MTHMR C677T homo - | | |
| >= 35 years | 2 | 18 | 20 | $p = 0.03$ $RR = 0.25,$ $RR \in (0.06; 0.99)$ $OR = 0.17,$ $OR \in (0.03; 0.92)$ |
| < 35 years | 8 | 12 | 20 | |
| Total | 10 | 30 | 40 | |

**Table 6:** Analysis of the risk of MTHMR MTHFR C677T mutation hetero-. In terms of the sample, the age over 35 years can be considered a risk factor (RR> 1, OR> 1), the risk is insignificant for the entire population from which is the study group (p> 0.05).

| Exposure vs Disease | Types of mutation | | Total | p - value RR, 95% OR, 95% |
|---|---|---|---|---|
| | MTHMR C677T hetero + | MTHMR C677T hetero - | | |
| >= 35 years | 10 | 10 | 20 | $p = 0.20$ $RR = 1.66,$ $RR \in (0.75; 3.71)$ $OR = 2.33,$ $OR \in (0.67; 8.54)$ |
| < 35 years | 6 | 14 | 20 | |
| Total | 16 | 24 | 40 | |

**Table 7:** Analysis of the risk of MTHFR A1298C mutation homo-. In terms of the sample, the age over 35 years can be considered a risk factor (RR> 1, OR> 1), the risk is insignificant for the entire population from which is the study group (p> 0.05).

| Exposure vs Disease | Types of mutation | | Total | p - value RR, 95% OR, 95% |
|---|---|---|---|---|
| | MTHFR A1298C homo + | MTHFR A1298C homo- | | |
| >= 35 years | 4 | 16 | 20 | $p = 0.68$ $RR = 1.33,$ $RR \in (0.34; 5.21)$ $OR = 1.42,$ $OR \in (0.27; 7.34)$ |
| < 35 years | 3 | 17 | 20 | |
| Total | 7 | 33 | 40 | |

**Table 8:** Analysis of the risk of MTHFR A1298C mutation hetero-. In terms of the sample, the age over 35 years can be considered a risk factor (RR> 1, OR> 1), the risk is insignificant for the entire population from which is the study group (p> 0.05).

| Exposure vs Disease | Types of mutation | | Total | p - value RR, 95% OR, 95% |
|---|---|---|---|---|
| | MTHFR A1298C hetero + | MTHFR A1298C hetero - | | |
| >= 35 years | 7 | 13 | 20 | $p = 0.33$ $RR = 0.7,$ $RR \in (0.33; 1.47)$ $OR = 0.54,$ $OR \in (0.15; 1.92)$ |
| < 35 years | 10 | 10 | 20 | |
| Total | 17 | 23 | 40 | |

**Table 9:** Analysis of risk ratio applicable to other types of mutations than those tested herein. In terms of the sample, the age over 35 years can be considered a risk factor (RR> 1, OR> 1), the risk is insignificant for the entire population from which is the study group (p> 0.05).

| Exposure vs Disease | Types of mutation | | Total | p - value RR, 95% OR, 95% |
|---|---|---|---|---|
| | Another types of mutation + | Another types of mutation - | | |
| >= 35 years | 14 | 6 | 20 | $p = 0.51$ $RR = 1.17,$ $RR \in (0.74; 1.85)$ $OR = 1.55,$ $OR \in (0.42; 5.76)$ |
| < 35 years | 12 | 8 | 20 | |
| Total | 26 | 14 | 40 | |

**Conclusions**

The study of the risk ratio concludes that age is a risk/protective factor defining for the appearance of mutation, most likely this mutation might also occurring due to other risk factors than age.

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# THROMBOTIC COMPLICATIONS IN CENTRAL VENOUS CATHETERIZATION WITH LONG-LIFE CATHETERS IN PEDIATRIC CHRONIC HEMODIALYSIS

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**Abstract**

Pediatric chronic hemodialysis has been significantly improved by the usage of long-life catheters. A frequent cause of catheter dysfunction is thrombosis in various forms. We present a case series of three pediatric patients with thrombosis of the long-life central venous catheters, illustrate the various evolutions of this complication, and, in consequence, the necessity of a multidisciplinary team approach in order to achieve the best permanent access pathway.

**Keywords:** thrombosis, long-life central venous catheter, children, ens stage renal disease.

**Introduction**

Recent data indicates that end stage renal disease (ESRD) incidence for pediatric patients (ages 0-18) has doubled in the last two decades. Similarly the prevalence has increased threefold in the same period.[1] Hemodiaysis continues to be the most frequently used renal replacement therapy. The number of chidren undergoing hemodialysis is higher than the sum of kidney transplant and peritoneal dialysis.[1] Vascular access is considered to be the backbone of the method. In children this implies an unique challenge for the medical team and the dialysis service provider mainly because of the small blood vessel diameter and of the vascular hiperreactivity.

**Patient presentation**

The clinical experience of the pediatric hemodialysis unit of St. Marry Emergency Hospital for Children of Iași showcases most of the aforementioned complications within three different patient evolutions. In our center we assure renal replacement therapy by hemodialysis for 14 children, 5 of which have long life central venous catheters. During their treatment, all 5 of these patients have experienced catheter malfunction and for 4 out of 5, catheter replacement was needed. Two cases associated severe renal osteodystrophy, with calciphylaxis lesions caused by the chronic hemodialysis. Two cases associated thrombosis and catheter infection.

*Patient 1* - S.A., 4 years old. He has been treated in our service from the age of 7 days by peritoneal hemodialysis for autosomal recessive polycystic kidney disease within a genetic syndrome (Mekel Gruber syndrome). After 18 months of apparently favorable evolution, the patient has developed multiple episodes of peritonitis. At the age of 3 years, the patient returns with peritoneal dialysis catheter dysfunction. We suspected sclerosing peritonitis, which was confirmed by biopsy. We stopped peritoneal dialysis and chose conversion to long life CVC hemodialysis. Arterio-venous fistula was not an option due to the patient's weight and age. At the age of 5 years, the patient is admitted for catheter dysfunction. Administration of Taurolok and Urokinase and tissue plasminogen activator – tPA (Altepaza – Actilyse) mildly and temporarily improved CVC functionality. As such CVC removal was recommended. Removal was practiced under vascular Doppler echography that indicated subclavian vein thrombosis. The initial recommendation was to place a new catheter on the left jugular vein, but the maneuver proved impossible. As such, a temporary central venous catheter was placed on the left femoral vein as insertion point. D-Dimer value was 1,4mcg/ml (0-0,3mcg/ml). The patient recieved anticoagulant therapy – Enoxaparin, in a dosage adapted to the renal insufficiency degree. After 6 months, control echography shows right internal jugular vein permeabilization. A new long life CVC was placed and the patient received oral anticoagulant the following 6 months.

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*Patient 2* – I.M.A., 10 years old. The patient has been monitored in our clinic since the age of one year with recurrent urinary tract infections in context of a posterior urethral valve that was discovered at a late stage, with association with secondary bilateral fifth degree vesico-ureteral reflux. In january 2014, at the age of 7 years, he began renal replacement therapy directly with hemodialysis with long-life catheter. During his therapy he developped two catheter disfunctions due to thrombosis and associated infection. Local treatment with Taurolok/Heparin (2014), followed by Taurolok/Urokinase (2015) has proven insufficient due to the added infections. Catheter removal and reimplantation was necessary. In june 2016, at the age of 9 years, he developped a new right internal jugular vein thrombosis confirmed by Doppler echography. D-dimer value at this time was 2314 ng/ml (0-250ng/ml).

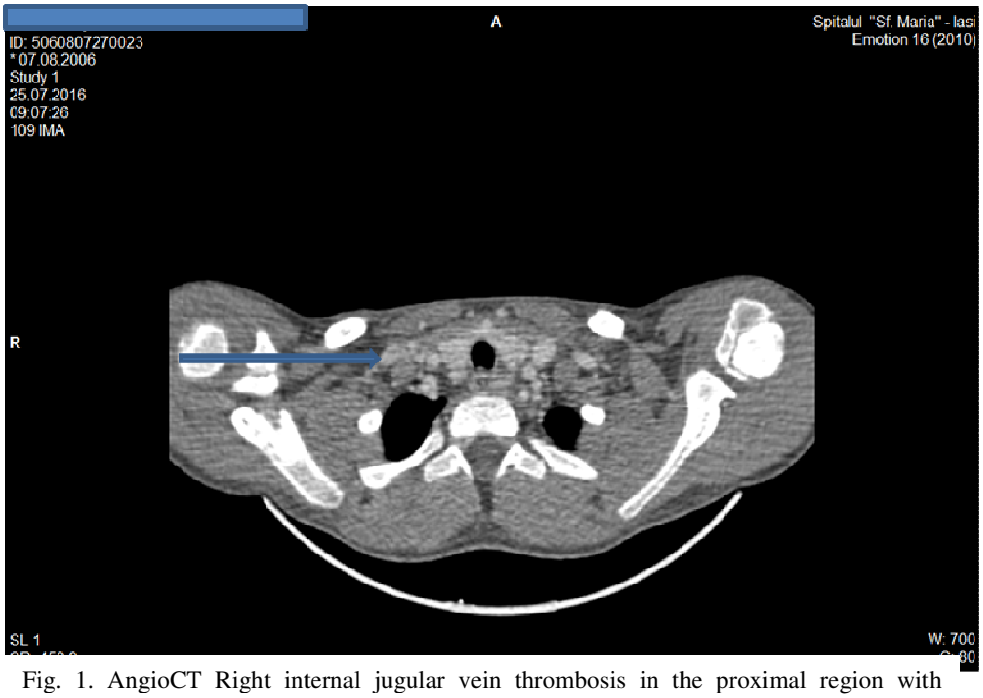


Fig. 1. AngioCT Right internal jugular vein thrombosis in the proximal region with extension to the superior vena cava. Colateral vein thrombosis is associated.

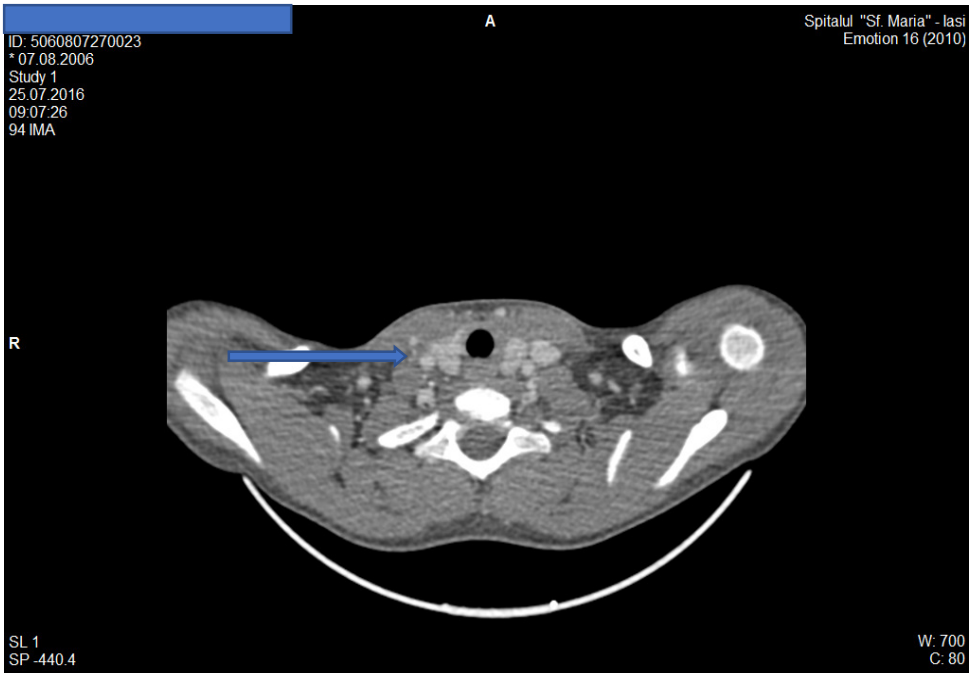


Fig. 2. AngioCT Right internal jugular vein thrombosis in the proximal region with extension to the superior vena cava. Colateral vein thrombosis is associated.

Treatment with Actilyse was initied. Due to the degree of thrombosis extension and technical issues in catheterisation of the left internal jugular vein, the decision was made to insert a temporary CVC on the right femural vein. The patient recieved anticoagulant therapy – enoxaparin – in dosage adapted to creatinine clearence. Two months later Doppler echography showed maintenance of the clot on the right internal jugular vein. The vascular surgeon decided to insert long life CVC on the left internal jugular vein, that is functional to the present day. Enoxaparin therapy was maintained. D-dimers decreased but their value is constantly high, regardless of the anticoagulant therapy (1120 ng/ml).

*Patient 3* - A.E., 20 years old, has been treated in the clinic since the age of three years old for impure nephrotic syndrome with poor evolution towards end stage renal disease. Renal replacement therapy was initiated in 2001 at the age of 3 years old with continuous ambulatory peritoneal dialysis (CAPD). After 13 years, at the age of 16 years of peritoneal dialysis he developped sclerosing peritonitis (figure 3), requiring conversion to chronic hemodialysis in 2014. In evolution he developped severe renal osteodystrophy that required parathyroidectomy. The surgical intervention only partially controlled the secondary hiperparathyroidism. In this context, the patient associated calciphylaxis, clinically manifested by skin lesions, vascular rigidity and metastatic calcifications (that were demonstrated by angio CT, echocardiography and histologically by peritoneal biopsy).

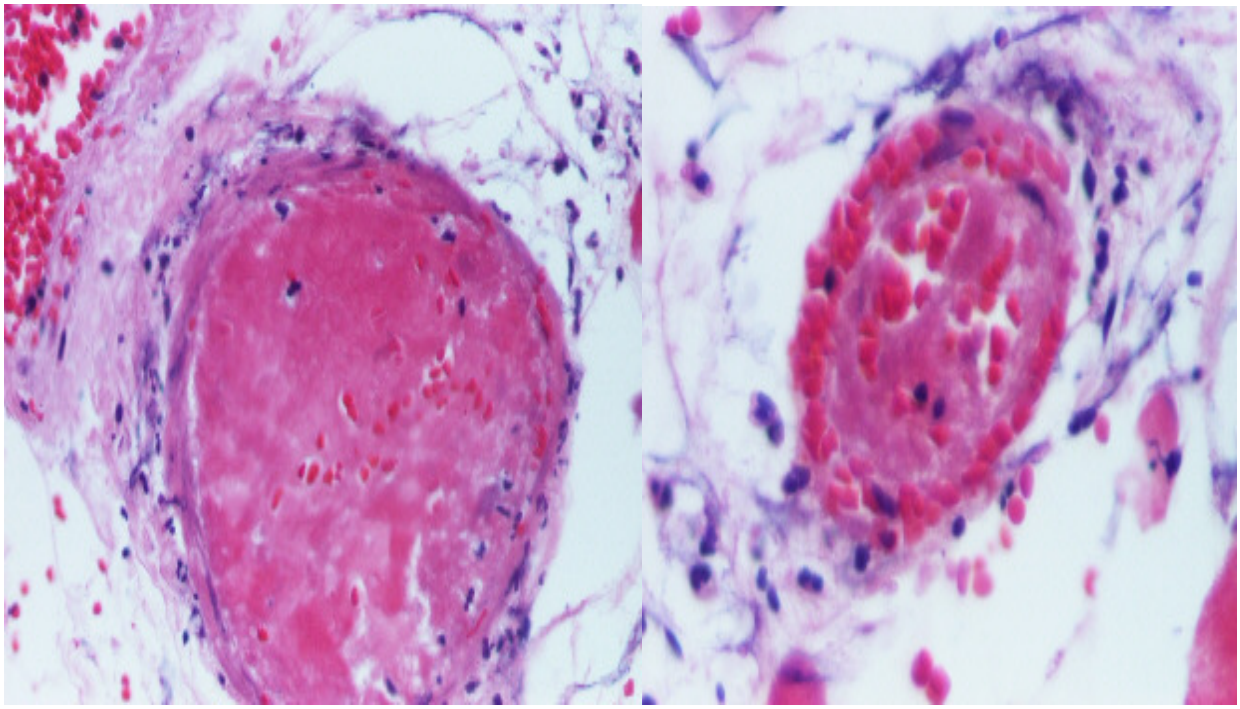

Fig. 3. Peritoneal biopsy - perivascular calcifications and thrombosis of the small peritoneal vessels.

In may 2015, at the age of 17, she developped catheter dysfunction for which local thrombolytic therapy (urokinase) was inefficient. Catheter replacement was required. CT examination describes right internal jugular vein thrombosis, tracheal calcification – in context of calciphylaxis (figure 4 and figure 5). Vascular calciphylaxis manifestations were associated. The degree of calcific uremic arteriolopathy was severe, leading to ventricular fibrilation and generalised non-epileptic seizures. The patient required cardio-pulmonary resuscitation, that was succesful. Hemodialysis on the new catheter was performed with difficulty as it was associated with multiple thrombotic recurrences. Actilyse and low molecular weight heparin therapy was associated. In july 2016 she was transferred in an adult hemodialysis service. The severe calciphylaxis lesions led to her death a few years later.

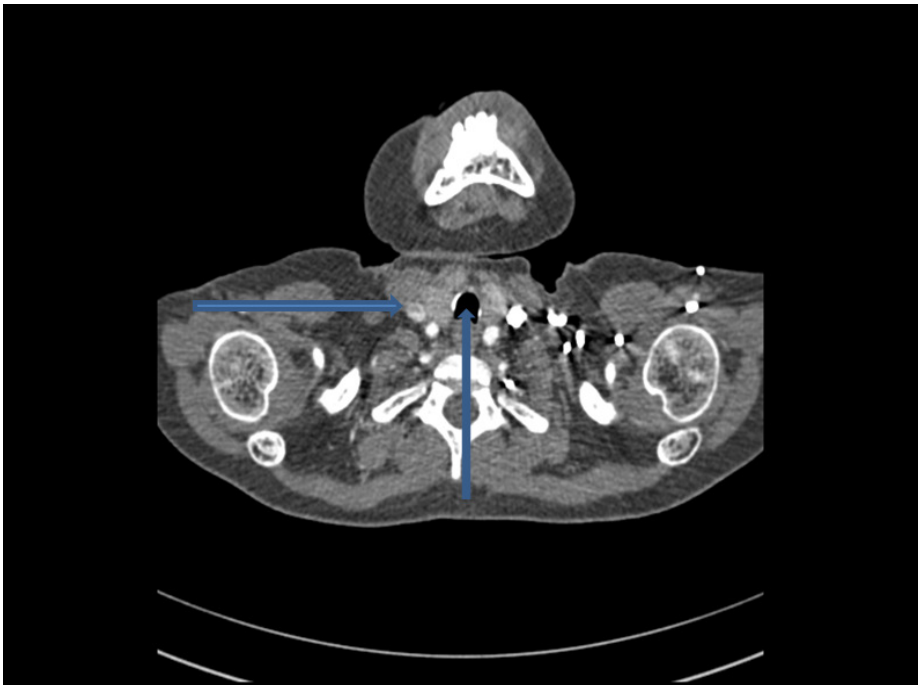

Fig. 4. AngioCT Right internal jugular vein thrombosis (left arrow) tracheal calcification – in context of calciphylaxis (middle arrow).

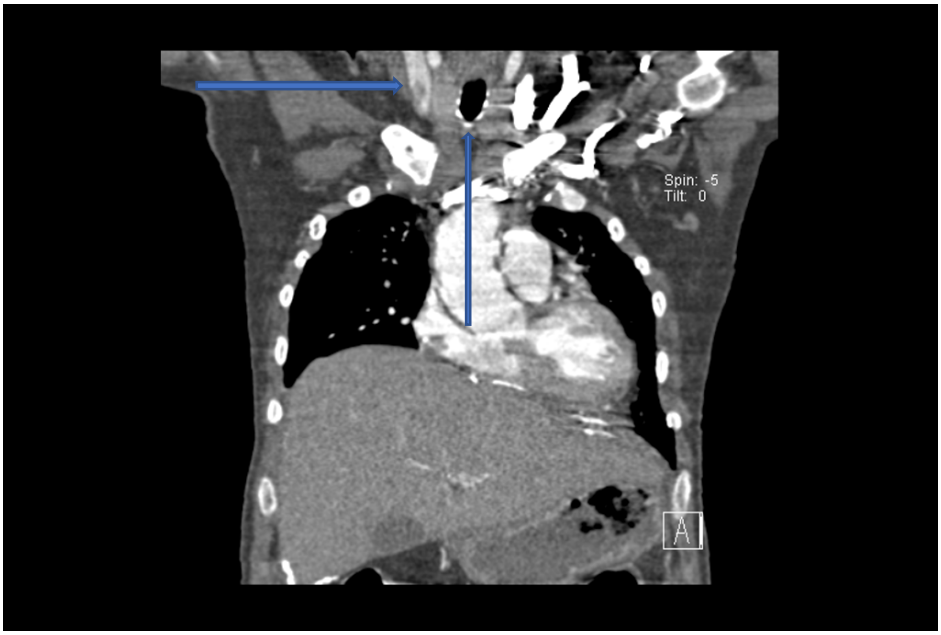


Fig. 5. AngioCT Right internal jugular vein thrombosis (left arrow) tracheal calcification – in context of calciphylaxis (middle arrow).

**Discussions**

During long term utilisation of a chronic dialysis catheter there are some foreseed trombotic complications such as fibrin coating, mural thrombosis, venous thrombosis and intraluminal clot formation.[2][3][4] After placing the central venous catheter, fibrin coating of the catheter may occur. Fibrin sheath development has been reported in 47% of CVC placed patients. This, in itself is a benign complication, but it may cause catheter malfunction, facilitating infection and mural thrombosis.[2] Mural thrombosis is usually found near the entrance of the catheter in the vessel or at great vein jonction. There are many risk factors for thrombosis, such as CVC biocompatibilty, the positioning of the tip of the catheter or its insertion, the insertion point, thrombofilia and CVC-related infections. [2] Endothelial lesion, part of the Virchow

triad (along with hipercoagulability, hemodynamic changes), also plays an important part. Vessel distruction may be caused by a variety of factors, such as mechanic lesion of the venous endothelium, the CVC insertion type, the number of vein perforation and the irritation of the vascular wall by medication. [2] The placement of the tip of the catheter in the vascular system is also an important risk factor in developing CVC-associated thrombosis. Incidence is greater in patients where the tip of the catheter is inserted in the innominate vein or proximal superior vena cava and less so in distal superior vena cava or cavo-atrial junction. [2] Patients with venous obstruction supposition must undertake venography, Doppler echography or computed tomography in order to localize the thrombus. [2] A strong association between thrombosis and infection has been suggested by multiple studies.[1][5][6]As such all practitioners from hemodialysis units must prove extreme vigilance when using CVC. There are studies that suggest that prophylactic washing of the catheter with urokinase will improve catheter permeability. CVC should be regularly washed either with urokinase or heparinized saline solution to reduce thrombotic occlusion of the catheter.[6]Aside from showcasing different clinical constelations of thrombosis, these three patients also illustrate the importance of the vascular wall in the progress of the disease. In all cases catheter dysfunction was related to thrombosis demonstrated by medical imaging and high value of D-Dimers. All of these patients required catheter replacement, but for different reasons. Thrombolytics did not mantain the catheter, but association of thrombolytics and low molecular weight heparin allowed for good recovery and fast reinsertion of the new catheter. Finally, calciphylaxis associated with thrombosis is a negative prognosis marker. These patients also demonstrate the necessity of interdisciplinary collaboration. Decision of catheter insertion point and insertion maneuvers require both an experienced anaesthesiologist as well as a vascular surgeon. Interventional radiologists are mandatory for evaluation of catheter placement and competent medical imaging interpretation of the complications. The pathologist was crucial in the calciphylaxis diagnosis. Obviously a great role is played by the nephrologist who needs to suggest the plan and, alongside the specialised nursing staff, to monitor the patient's evolution.

**Conclusions**

- Central venous catheter is a viable vascular pathway for the small child when peritoneal dialysis cannot be performed, even if it is associated with multiple complications.
- When catheter permeabilty is reduced by partial thrombosis, tissular plasminogen activator, urokinase and even heparin can have successful results.
- Vascular pathway management requires adequate planning. Interdisciplinary teams must collaborate (nephrologists, anaesthesiologists, dialysis-specialised nursing staff, surgeons and interventional radiologists) in order to achieve the best permanent access pathway.
- It is imperative for the practitioners of this field to have morbidity reduction as the long term premesis in this special category of patients.

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# LICHTENSTEIN TECHNIQUE VERSUS OTHER OPEN TECHNIQUES FOR INGUINAL HERNIA REPAIR: A RETROSPECTIVE COMPARATIVE STUDY

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**Abstract**

Groin hernia repair is one of the most common procedure in general surgery. Although numerous surgical techniques have been developed, Lichtenstein technique is the best evaluated technique. Despite this, the overall recurrence rate for inguinal hernia is estimated at 15%. The aim of this retrospective comparative study is to compare the clinical outcomes of Lichtenstein techniques with other mesh repair techniques and tissue-based techniques for the treatement of primary inguinal hernia among adult Romanian patients. Our data confirms that the Lichtenstein repair technique remains one of the best techniques in terms of recurrence rate and postoperative complications. However, in our study, Shouldice repair seems to be superior to mesh-based and other tissue-based techniques, due to low recurrence, small number of postoperative complications and shorter hospitalization. We found no satistically significant differences between Traucco, Lichtenstein and Shouldice technique, but we suggest using these methods over Bassini, Postemski or Juvara repair techniques.

**Keywords:** inguinal hernia, Lichtenstein technique, Shouldice technique, tissue-based repair techniques.

## Introduction

Groin hernia repair is one of the most common procedure in general surgery (Anadol et al., 2011). Every year, 800.000 cases are registered in United States and approximately 0.8% of Western population undergo inguinal hernia repair in a 5-year period (Rutkow 2003; Antoniou et al., 2014). Worldwide, more than 20 million operations are performed yearly and the chance of a man to undergo inguinal hernia repair is 27% (HerniaSurge Group, 2018; Youssef et al., 2015). In order to solve this problem, numerous surgical techniques were developed. According with latest International guidelines for groin hernia management, Lichtenstein technique is the best evaluated technique and compared with non-mesh techniques, has a lower recurrence rate (HerniaSurge Group, 2018). Even though the Lichtenstein Institute and Shouldice Hospital reported a recurrence rate less than 1%, in non-specialist centers, the reported reccurence for mesh repair vary between 0.3-2.2% and may reach 17% for tissue repair (Nordin et al., 2002; Anadol et al., 2011). Despite the large use of Lichtenstein technique in primary inguinal hernia repair, the overall recurrence rate for inguinal hernia is estimated at 15% (HerniaSurge Group, 2018). Also, long-term chronic pain occurs in 12% patients underwent surgical procedure for inguinal hernia (HerniaSurge Group, 2018). Moreover, numerous reports indicate that primary tissue repair methods like Shouldice or Dresda are the procedures of choice for primary inguinal hernia (Arvidsson et al., 2005; Porrero et al., 2005; Youssef et al., 2015). The aim of this retrospective comparative study is to compare the clinical outcomes of Lichtenstein techniques with other mesh repair techniques and tissue-based techniques for the treatement of primary inguinal hernia among adult Romanian patients.

## Patients and methods

This study was performed in the general surgery unit of C.F. Hospital, Iasi. All patients over 18 years old with diagnosis of primary inguinal hernia were retrospectively analyzed between January 2007 and December 2016. The exclusion criteria from the study were: patients under 18 years old, previous operation in inguinal region, femoral hernia, umbilical hernia, diabetes mellitus, coagulopathy. The variables registered for each patient included age, sex, associated comorbidities, surgical techniques chosen, post-operative complications, lengh of hospital stay and percentage of recurrence at 3 years. The surgical techniques used in all cases were: Lichtenstein, Shouldice, Trabucco, McVay, Bassini, Juvara, Postemski and were performed by five surgeons. A single-dose antibiotic prophylaxis was used in the operating room at the start of the procedure, except for patients with mesh-based techniques which receive an additional single-dose of antibiotic. Postperatively, all patients received a low-dose of heparin (4000 IE s.c.). All data were analyzed in SPSS 20 IBM program.

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**Results**

Over a period of 10 years, in our unit were operated 2010 hernias. After we applied the exclusion criteria, only 1703 cases were included in the study. Shouldice repair was performed in 695 cases, Lichtenstein technique was used in 579 cases and Trabucco in 251 cases. The rest of 178 cases were operated using Bassini, Postemski, Juvara or McVay techniques (Figure 1). The age and gender are shown in Table 1 and Table 2.

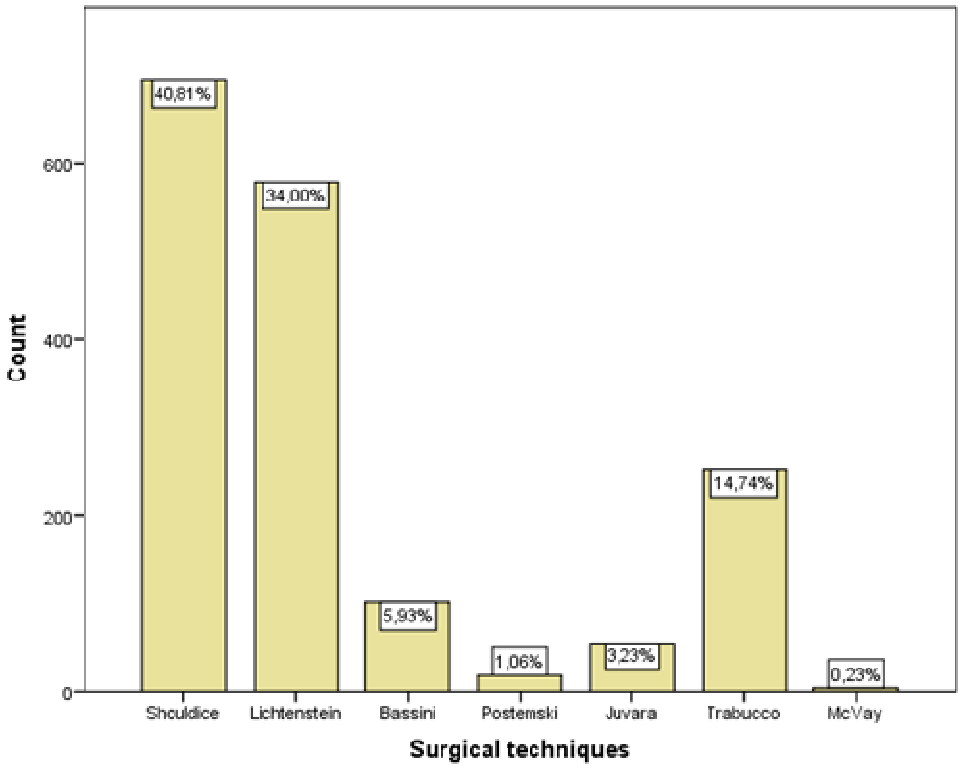


Figure 1. Distribution of surgical techniques.

**Age**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Age | 1703 | 18 | 90 | 58,46 | 15,348 |
| Valid N (listwise) | 1703 | | | | |

Table 1. Distribution of patients by age.

**Gender**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 1590 | 93,4 | 93,4 | 93,4 |
| | Female | 113 | 6,6 | 6,6 | 100,0 |
| | Total | 1703 | 100,0 | 100,0 | |

Table 2. Distribution of patients by gender.

The gender was dominated by male with 93,4% and the mean age of the patients was 58,46 ± 15,5 years. The mean age in patients with Lichtenstein (60,86 ± 14,86) and Trabucco (58,16 ± 17,31) techniques was higher because some of the older patients prefered the mesh-based techniques (Figure 2). The distribution according to the residence area, rural/urban, show very small differences: 52,2% rural and 47,8 urban. Most of the patients did not have preoperative comorbidities (59%) and only 13 cases (0,8%) underwent emergency surgery. Therefore, postoperative complications were registered only in 4,4% of cases. In our study, the overall recurrence at 3 years was 2,3%. Although we had very few cases underwent emergency surgery and the postoperative rate was small (4,4%), most of the patients (63,7%) stayed in the hospital for 5 to 10 days.

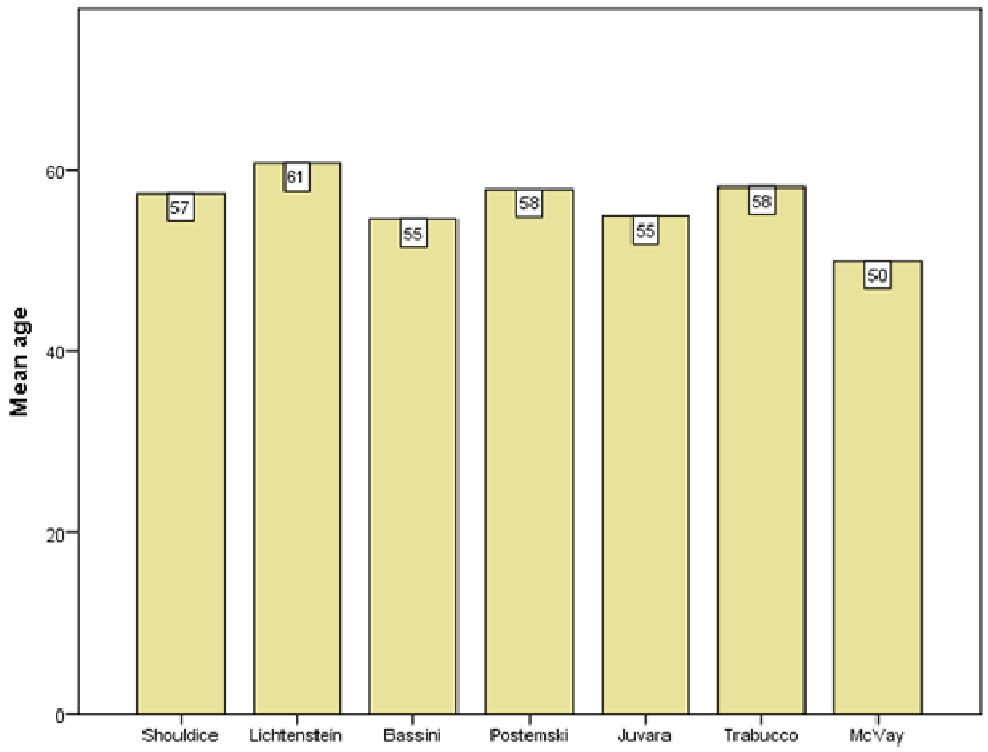


Figure 2. Age distribution by surgical technique.

When we compared the lenght of hospitalization between surgical techniques, we found that under 5 days hospitalization had 157 patients underwent Shouldice technique, 55 patients with Lichtenstein procedure and only 2 patients with Trabucco technique (Table 3). Moreover, 10-15 days hospitalization was registered in 166 patients underwent Lichtenstein techniques and only 60 patients with Shouldice repair method. Similar data were obtained for the rest tissue-based techniques (Table 3). Also, when we analyzed the distribution of recurrence at three years by surgical techniques, we have noticed that Lichtenstein and Shouldice techniques have equal number of recurrence but different percentage (2,2% and 1,9%). This difference in percentage is due to case number difference between this techniques. The smallest recurrence rate was registered in patients underwent Trabucco repair method, 1,2% (Table 4). With over 11%, Postemski technique had the highest recurrence rate amog all analyzed techniques. Patients with other tissue-based repair methods like Bassini or Juvara, had a significant incresed number of cases with hernia recurrence (Table 4). Even though we did not observe recurrence in McVay repair method, the small number of cases make this result irrelevant. Postoperative complications in Lichtenstein technique were dominated by hemtoma with six cases. In this inguinal hernia repair method we found one case of mesh rejection and one case of seroma. Similar results were obtained in Trabucco technique (Table 5). In Shouldice technique we found almost four times more cases with hematoma (25 cases) compare with Lichtenstein. Patients underwent Bassini or Postemski techniques, had a significant increased number of postoperative complications (9,9% and 16,7%) compared with the rest of techniques.

**Lenght of hospital stay**

| Surgical techniques | | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|---|
| Shouldice | Valid | <5 days | 157 | 22,6 | 22,6 | 22,6 |
| | | 5-10 days | 472 | 67,9 | 67,9 | 90,5 |
| | | 10-15 days | 60 | 8,6 | 8,6 | 99,1 |
| | | 15-20 days | 5 | ,7 | ,7 | 99,9 |
| | | >20 days | 1 | ,1 | ,1 | 100,0 |
| | | Total | 695 | 100,0 | 100,0 | |
| Lichtenstein | Valid | <5 days | 55 | 9,5 | 9,5 | 9,5 |
| | | 5-10 days | 329 | 56,8 | 56,8 | 66,3 |
| | | 10-15 days | 166 | 28,7 | 28,7 | 95,0 |
| | | 15-20 days | 26 | 4,5 | 4,5 | 99,5 |
| | | >20 days | 3 | ,5 | ,5 | 100,0 |
| | | Total | 579 | 100,0 | 100,0 | |
| Bassini | Valid | <5 days | 7 | 6,9 | 6,9 | 6,9 |
| | | 5-10 days | 69 | 68,3 | 68,3 | 75,2 |
| | | 10-15 days | 24 | 23,8 | 23,8 | 99,0 |
| | | 15-20 days | 1 | 1,0 | 1,0 | 100,0 |
| | | Total | 101 | 100,0 | 100,0 | |
| Postemski | Valid | <5 days | 1 | 5,6 | 5,6 | 5,6 |
| | | 5-10 days | 12 | 66,7 | 66,7 | 72,2 |
| | | 10-15 days | 4 | 22,2 | 22,2 | 94,4 |
| | | 15-20 days | 1 | 5,6 | 5,6 | 100,0 |
| | | Total | 18 | 100,0 | 100,0 | |
| Juvara | Valid | <5 days | 4 | 7,3 | 7,3 | 7,3 |
| | | 5-10 days | 30 | 54,5 | 54,5 | 61,8 |
| | | 10-15 days | 17 | 30,9 | 30,9 | 92,7 |
| | | 15-20 days | 3 | 5,5 | 5,5 | 98,2 |
| | | >20 days | 1 | 1,8 | 1,8 | 100,0 |
| | | Total | 55 | 100,0 | 100,0 | |
| Trabucco | Valid | <5 days | 2 | ,8 | ,8 | ,8 |
| | | 5-10 days | 169 | 67,3 | 67,3 | 68,1 |
| | | 10-15 days | 72 | 28,7 | 28,7 | 96,8 |
| | | 15-20 days | 7 | 2,8 | 2,8 | 99,6 |
| | | >20 days | 1 | ,4 | ,4 | 100,0 |
| | | Total | 251 | 100,0 | 100,0 | |
| McVay | Valid | 5-10 days | 4 | 100,0 | 100,0 | 100,0 |

Table 3. Lenght of hospitalization by surgical techniques.

**Recurrence**

| Surgical techniques | | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|---|
| Shouldice | Valid | Recurrence | 13 | 1,9 | 1,9 | 1,9 |
| | | No recurrence | 682 | 98,1 | 98,1 | 100,0 |
| | | Total | 695 | 100,0 | 100,0 | |
| Lichtenstein | Valid | Recurrence | 13 | 2,2 | 2,2 | 2,2 |
| | | No recurrence | 566 | 97,8 | 97,8 | 100,0 |
| | | Total | 579 | 100,0 | 100,0 | |
| Bassini | Valid | Recurrence | 8 | 7,9 | 7,9 | 7,9 |
| | | No recurrence | 93 | 92,1 | 92,1 | 100,0 |
| | | Total | 101 | 100,0 | 100,0 | |
| Postemski | Valid | Recurrence | 2 | 11,1 | 11,1 | 11,1 |
| | | No recurrence | 16 | 88,9 | 88,9 | 100,0 |
| | | Total | 18 | 100,0 | 100,0 | |
| Juvara | Valid | Recurrence | 3 | 5,5 | 5,5 | 5,5 |
| | | No recurrence | 52 | 94,5 | 94,5 | 100,0 |
| | | Total | 55 | 100,0 | 100,0 | |
| Trabucco | Valid | Recurrence | 3 | 1,2 | 1,2 | 1,2 |
| | | No recurrence | 248 | 98,8 | 98,8 | 100,0 |
| | | Total | 251 | 100,0 | 100,0 | |
| McVay | Valid | No recurrence | 4 | 100,0 | 100,0 | 100,0 |

Table 4. Distribution of 3 years recurrence by surgical techniques.

**Postoperative complications**

| Surgical techniques | | | Frequency | Percent | Valid Percent |
|---|---|---|---|---|---|
| Shouldice | Valid | No complication | 665 | 95,7 | 95,7 |
| | | Superficial infection | 5 | ,7 | ,7 |
| | | Hematoma | 25 | 3,6 | 3,6 |
| | | Total | 695 | 100,0 | 100,0 |
| Lichtenstein | Valid | No complication | 568 | 98,1 | 98,1 |
| | | Superficial infection | 3 | ,5 | ,5 |
| | | Hematoma | 6 | 1,0 | 1,0 |
| | | Reject of the mesh | 1 | ,2 | ,2 |
| | | Seroma | 1 | ,2 | ,2 |
| | | Total | 579 | 100,0 | 100,0 |
| Bassini | Valid | No complication | 92 | 91,1 | 91,1 |
| | | Superficial infection | 2 | 2,0 | 2,0 |
| | | Hematoma | 7 | 6,9 | 6,9 |
| | | Total | 101 | 100,0 | 100,0 |
| Postemski | Valid | No complication | 15 | 83,3 | 83,3 |
| | | Superficial infection | 1 | 5,6 | 5,6 |
| | | Hematoma | 2 | 11,1 | 11,1 |
| | | Total | 18 | 100,0 | 100,0 |
| Juvara | Valid | No complication | 45 | 81,8 | 81,8 |
| | | Superficial infection | 4 | 7,3 | 7,3 |
| | | Hematoma | 6 | 10,9 | 10,9 |
| | | Total | 55 | 100,0 | 100,0 |
| Trabucco | Valid | No complication | 241 | 96,0 | 96,0 |
| | | Superficial infection | 3 | 1,2 | 1,2 |
| | | Hematoma | 7 | 2,8 | 2,8 |
| | | Total | 251 | 100,0 | 100,0 |
| McVay | Valid | No complication | 3 | 75,0 | 75,0 |
| | | Hematoma | 1 | 25,0 | 25,0 |
| | | Total | 4 | 100,0 | 100,0 |

Table 5. Postoperative complications.

**Discussions**

Though inguinal hernia is one of the most common surgical procedure in general surgery and numerous surgical techniques were developed, the number of recurrences and postoperative complications are still high. According to International guidelines for groin hernia management, the recurrence rate in inguinal hernia repair is 15% and in 12% of patients underwent surgery for inguinal hernia, pain lasting more than 3 months, occurs (HerniaSurge Group, 2018). A consensus regarding the best technique has not been achieved. Since 1970 when Lichtenstein described the tension-free inguinal hernia repair, numerous comparative studies with other tissue-based techniques were published (Panda et al., 2012). Recent publications reveal that tissue-based techniques are effective as the standard Lichtenstein procedure (Kockerling et al., 2018; Youseff et al., 2015). Therefore, we developed a retrospective comparative study, in order to evaluate the clinical outcomes of Lichtenstein technique and compare with other mesh-based or tissue-based techniques.

In our study only 6,6% patients were female and the mean age of the patients was 58,46 ± 15,5 years. Shouldice patients were younger than those with Lichtenstein or Trabucco techniques (57 years vs 61 and 58 years; $p < 0.02$). Similar results were obtained by Kockerling et al. with a mean age of 40 years for Shouldice group (Kockerling et al., 2018). A possible explanation for these data may be the patients preference. In our cohort, many elderly patients preferred Lichtenstein technique. In our study only 0,8% underwent emergency surgery. Though, the postoperative complication rate was over 4%. When we compare postoperative complications between Lichtenstein and the rest of surgical techniques, we found that Shouldice had a significant increased postoperative complication rate and very similar with Trabucco (1,9% vs 4,3% and 4%; $p = 0.460$). Bassini and Postemski had an even greater postoperative complications percentage (8,9% and 17,7%; $p = 0.437$, respectively $p = 0.113$). Similar to our data, Porrero et al. on 775 patients who underwent Shouldice herniorraphy, found ecchymosis in 6% of cases and infections in 0,2% (Porrero et al., 2004). Also, Hetzer et al. found very similar data: 4,6% patients with hematoma and 1,3% infections in Lichtenstein technique (Hetzer et al., 1999). We also compare the lenght of hospital stay between Lichtenstein and rest of the techniques. We found that patients undewent Shouldice repair had the shortest period of hospitalization. Taken together, mesh-based techniques (Lichtenstein and Trabucco) had only 10,1% of under 5 days hospital stay patients. By comparison, over 22% of patients underwent Shouldice repair had under 5 days of hospitalization ($p < 0.05$). Other publications report a significant lower period of hospitalization in both mesh-based and tissue-based techniques.(Aldoescu et al 2015) Porrero et al. report that only 1% of patients were hospitalized for 3 days and 76% of patients stay in hospital only one day (Porrero et al., 2004). Same data were reported by Hetzer et al., with a mean post-operative stay between 3,3-3,5 days (Hetzer et al., 1999). Also, Berndsen et al. reported that 98% of patients stayed in hospital one day or less (Berndsen et al., 2002). Even though we had similar postoperative complications rate with other published studies, 63,7% of the patients from our study, stayed in the hospital for 5 to 10 days. We believe that these big differences between our data and other published studies regarding hospitalization, may be due to „historical habits" of Romania surgeons. This issue must be futher investigated and measures must be taken in order to reduce hospitalization of patients. When we analyzed the 3 years recurrence of the patients, we found that the smallest recurrence rate was registered in patients underwent Trabucco repair method, 1,2%. Lichtenstein and Shouldice techniques had similar recurrence (2,2% vs 1,9%). Consistant with our data, Ripetti et al. obtained a recurrence rate in patients underwent Trabucco technique of 1,85% (Ripetti et al., 2014). We registered 7,9% recurrence in patients underwent Bassini technique. Semnificative lower reccurence rate, only 2%, was published by Singh et al. on 50 patients underwent Bassini technique (Singh et al., 1999). On 381 patients electively operated with Bassini technique, Maggiore et al. found a recurrence rate of 5,51% (Maggiore et al., 2001). Consistant to our data, Hay et al. in a large multicenter controlled trial found a 8,6% recurrence rate for patients underwent Bassini repair (Hay et al., 1995). Different to our data, a Cochrane review comparing 2566 Shouldice repairs with 1121 mesh-based techniques, showed a higher recurrence rate for the Shouldice technique compared with other mesh techniques (OR 3.80, 95% CI 1.99–7.26) (Amato et al., 2012). Also, a study from Danish Hernia Database show a recurrence at 96 months in patients underwent Lichtenstein repair, of 3% (Bisgaard et al., 2008). Same results were obtained by Balen et al. (3,4% recurrence) and Anadol et al. (3,7%) (Balen et al., 2000; Anadol et al., 2011). Despite these results, when we applied One-Way ANOVA Comparative Test, no statistical difference between groups was attained. (Table 6).

**Conclusions**

Despite big amount of publications and data, it is very difficult to determine the best inguinal hernia technique. Depending on individually particularities of each case, surgeons should be prepared to perform any of the analyzed techniques. Lichtenstein repair technique remains one of the best techniques in terms of recurrence rate and postoperative complications. Overall, Shouldice repair seems to be superior to mesh-based and other tissue-based techniques, with low recurrence, small number of postoperative complications and shorter hospitalization. We found no satistically significant differences between Traucco, Lichtenstein and Shouldice technique, but we suggest using these methods over Bassini, Postemski or Juvara repair techniques.

**Conflict of interests**

None of the authors of this manuscript could represent the subject of a potential competing financial or other kind of interests.

| (I) Surgical technique | (J) Surgical technique | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|
| | | | | |
| **Shouldice** | Lichtenstein | ,004 | ,008 | ,999 |
| | Bassini | ,061* | ,016 | ,003 |
| | Postemski | ,092 | ,035 | ,125 |
| | Juvara | ,036 | ,021 | ,601 |
| | Trabucco | -,019 | ,011 | ,610 |
| | McVay | -,019 | ,075 | 1,000 |
| **Lichtenstein** | Shouldice | -,004 | ,008 | ,999 |
| | Bassini | ,057* | ,016 | ,007 |
| | Postemski | ,089 | ,036 | ,162 |
| | Juvara | ,032 | ,021 | ,726 |
| | Trabucco | -,022 | ,011 | ,415 |
| | McVay | -,022 | ,075 | 1,000 |
| **Trabucco** | Shouldice | ,019 | ,011 | ,610 |
| | Lichtenstein | ,022 | ,011 | ,415 |
| | Bassini | ,079* | ,018 | ,000 |
| | Postemski | ,111 | ,036 | ,036 |
| | Juvara | ,055* | ,022 | ,173 |
| | McVay | ,000 | ,075 | 1,000 |

Table 6. Rate of recurrence – statistical analysis between surgical procedures.

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All authors approved the final manuscript and agree to be accountable for all aspects of the work. All authors contributed equally to this paper. This original study was performed in accordance with Declaration of Helsinki and was approved by the local hospital ethics committee. Informed consent was obtained from the parents of reported pediatric patients. None of the authors have any conflicts of interest or any competing interests. All the data presented can be available on request. Funding: this research received no specific grant from any funding agency in the public or commercial sectors.

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# SECONDARY ECHINOCOCOSIS - RUPTURED HEPATIC HYDATID CYST IN CHILDREN

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**Abstract**

Hepatic hydatid cyst (HC) is the most frequent location (60%) in children. Besides the direct mechanical action exerted on the affected organ (producing local morpho-pathological changes), HC can cause complications, with negative impact on the entire body through its toxic-allergic action [1].

We present a case of a nine years old female child from urban area with hepatic HC, rupted into the peritoneal cavity with acute peritonitis. Corroborating the clinical data with laboratory, it was suspected the existence of a positive diagnosis of hepatic HC ruptured and discharged into the peritoneal cavity, biliary lithiasis with acute cholecystitis. The biological confirmation of the parasitosis was brought during hospitalization by ELISA test. Surgical exploration showed a large ruptured HC of the left lobe of the liver, with multiple daughter cysts in the peritoneal cavity. Surgical treatment consisted in median laparotomy with hepatic Lagrot procedure, cleaning the ruptured cystic and abdominal cavity with hypertonic saline 20% and its external drainage on silicone tube. The post-operative evolution of the case was without major complications. The hepatic cavity disappearance was found in ultrasound examination in 3 months after the hospital discharge and the biliary lithiasis after 6 months.

The diagnosis of hydatid cyst must be considered especially in endemic regions. We consider that the peritoneal cleaning with hypertonic saline and the early and prolonged prophylaxis with anthelmintics may be salutary in order to avoid secondary echinococosis.

**Keywords:** hydatid cyst, hydatid disease, Lagrot procedure, Taenia Echinococcus, child.

**Introduction**

The hydatid cyst continues to attract the attention of the medical world by the frequency of the cases accidentally discovered in infantile population, or of its complications.It is caused by the larval stage of development of Taenia Echinocococcus Granulosus in different human organs (liver 60%, lung 30% and other organs 10%). HC had a torpid evolution for years, or become acute by the rupture of the cyst followed by mechanical, allergic or septic complications which can endanger the patient's life. [2] [3]

The incidence of the HC in the western part of Romania, is estimated at 3.1 \ 100,000 children, WHO considering our country as an endemic area [4] [5].

In recent years, the urbanization of the disease was observed, probably due to the large number of tramp dogs, or due to the population migration from rural to urban areas [5].

Due to globalization which includes tourism and migration, the condition required an approach also by the countries that showed a low incidence of the disease or where it was considered eradicated (Western Europe, USA) [6] [7].

The rupture of hepatic HC and its evacuation into the peritoneal cavity is rarely mentioned in children literature. HC present some special clinical-evolutive features and, indications for therapeutic methods. [8][9].

**Clinical case presentation**

We present the case of a nine years old female child from urban area, hospitalized in our service transfered from the infectious disease department.

She presented with *abdominal pain syndrome, acute enterocolitis, acute dehydration syndrome 10% and acute erythematous angina.*

After 48 hours of treatment in infectious disease department, the abdominal pain was not remitted, becomed colicative and diffuse, with the muscle contraction.

On admission in our service, the patient is conscious, febrile (38°C), with general influenced condition, lose of appetite, nausea and diarrhea. Pulmonary, she presents superficial breaths with tachypnea, tachycardia with pulse 140 beats / min. Mobile abdomen with breathing - spontaneously diffuse - sensitive and at superficial palpation a tumoral hypogastric tumour, with pain and reflex generalized muscle contraction at deep palpation.

Laboratory findings present leukocytosis (14 x $10^3$) with neutrophilia (69.4%) and eosinophilia (15.6%).

The increased inflammatory samples, ESR 55 mm / 1 h, fibrinogen 5.60 g / l, C reactive protein (PCR) 57.26 mg / l, procalcitonin 0.07 ng / ml, and glucose 7.66 mmol / l.

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The abdominal ultrasound confirms, thickening of the gallblader walls of 0.5 cm, aspect of biliary lithiasis with acute cholecystitis. Retro-urinary bladder transsonic-oval image of 7 / 3.5 cm raises the suspicion of collection. The gynecological consultation identify an infantile uterus, with normal ovaries.The chest radiography was normal.

The abdominal-pelvic CT, native and with contrast, stress in the second segment from the left hepatic lobe a tumor with multiple-lobes outline of 4/3.8 cm, with content of dense fluid type. Gall bladder with thickened wall, with limestone declive sediment.

At abdominal-pelvic level, collection with para-fluid densities of about 22 HU, dense proteinaceous increased content, bordered by a peripheral wall with capture of contrast substance, with sinuous distribution through the intestine loops, going from the bottom of the Douglas pouch up under to the lower pole of the right hepatic lobe (Figure 1).

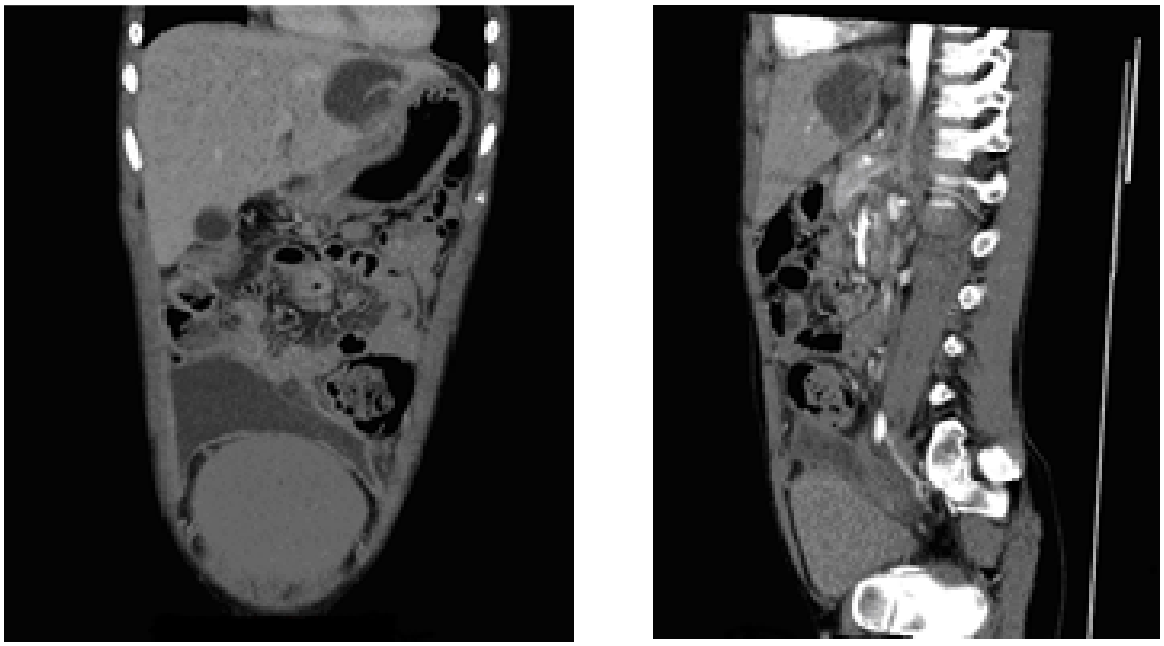

Fig 1. LHS ruptured hydatid cyst with intra-peritoneal adherences between organs.

Corroborating the clinical data with laboratory, it is suspected the existence of a positive diagnosis of hepatic HC ruptured and discharged into the peritoneal cavity, biliary lithiasis with acute cholecystitis. The biological confirmation of the parasitosis is brought during hospitalization by ELISA test. Surgical exploration showed a large ruptured HC of the left lobe of the liver, with multiple daughter cysts in the peritoneal cavity

Pre-operative therapy consisted of antibiotics Tazocin 2.25g IV 4x1 bottle / day, 200mg Albendazole 2x1 tablet / day, Paracetamol 3x35 ml bottle 100 ml IV/ day and hydro-electrolyte and acid-base rebalancing.

Surgical treatment consisted in median laparotomy with hepatic Lagrot procedure, cleaning the ruptured cystic and abdominal cavity with hypertonic saline 20% and its external drainage on silicone tube. A special attention was paid to the elimination of the vesiculae ficae from the peritoneal cavity, and those fixed in the omentum removed en bloc by resection (Figure 2). Peritoneal fluid was collected for culture, the peritoneal cavity was washed with hypertonic saline 20% and the Douglas was externally drained with silicone tube.

The peritoneal cavity thorough inspection reveals a macroscopic phlegmonous appendix, reason why it was practiced the appendectomy.

The post-operative evolution of the case was without major complications. The patient was discharge 18 days after, in good condition. She received oral ALBENDAZOLE 15mg/kg body for three month. The post-operative following period for the clinical and ultrasound re-evaluation took place at intervals of 3-6 months, not recording peritoneal recurrences. The hepatic cavity disappearance was found in ultrasound examination in 3 months after the hospital discharge and of the biliary lithiasis after 6 months.

**Discusions**

The complications of the hepatic HC in children are rare, represented by its rupture or fissure in the ducts or peritoneal cavity, over-infection or compression on the adjacent organs [10]. Its incidence varies in the literature from 1.75 to 8.6% [11] [12] [13].

The rupture and seeding of the peritoneal cavity occurs most frequently in the large liver cysts, after a trauma, or when conducting a corticalisation of the cyst on the underside of the liver. In contrast with Grozavu opinions, we recommend medical treatment as first therapeutic step because it doesn't lead to serious complications [14].

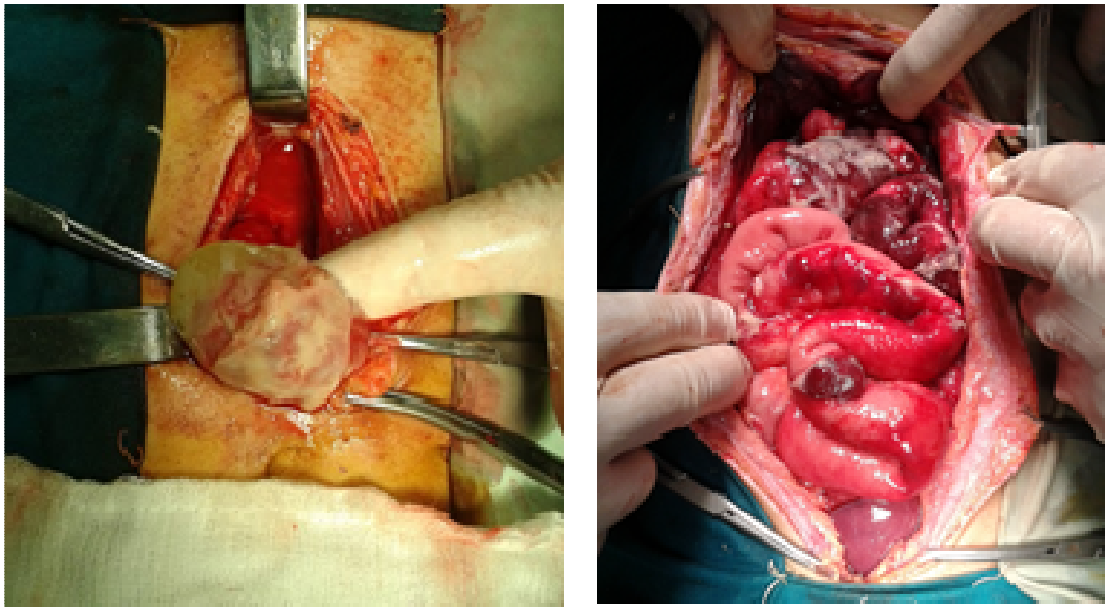

Fig 2. Hydatid cyst erupted in the peritoneal cavity vesicula ficae.

The hepatic HC, ruptured and emptied of its contents into the peritoneal cavity represents an immediate medical-surgical emergency, with the patient possible onset of anaphylactic shock or a moderate peritoneal irritation phenomena with secondary hydatidosis, without identifining the exact moment of rupture [15].

The clinical picture of this complication is influenced very much by the location and the size of the cyst, by the compression of the abdominal cavity organs.This picture is suitable to a differentiary diagnosis with acute appendicitis, peritonitis, or tumoral formation [16].

Most frequently, the rupture in the peritoneum is symptomatic, with constant abdominal symptoms [17] (abdominal pain, vomiting, abdominal tenderness and/or rebound), as well as marked allergic symptoms in up to 25% of the cases [13] (cutaneous rash, urticaria, anaphylactic shock).

We don't encountered anaphylactic shock as other authors reported (18).

Our intraperitoneal rupture was missed, due to absence of abdominal or anaphylactic complications, and due to the presence of diarrhea, which explains the late diagnosis, in contrast to other author's opinions [19] but not so late-until few weeks after the rupture. We discourage the wait and see tactics, in order to avoid any other possible complications, and we recommend immediate surgery. Peritoneal hydatidosis comprises 10–16% of intra-abdominal hydatid disease [20]. It mainly occur secondary to rupture of a hepatic or splenic cyst either spontaneously or accidentally during surgery [21].

Primary peritoneal hydatidosis accounts for less than 2% of intra-abdominal hydatidosis [22]. In our experience we do not encountered a primary peritoneal hydatidosis as Hegde N, et al. did [23].

Long-term monitoring is preferred but is difficult due to the nomadic lifestyle of the family and sometimes population migration

**Conclusions**

Patients with this complication are often operated for other conditions, such as acute appendicitis, peritonitis, acute cholecystitis or abdominal tumours.

The diagnosis and treatment of this complication is difficult and requires the existence of a medical team (radiologist, surgeon,anesthesiologist) working together in order to put the correct diagnosis and to succeed the surgery.

The surgical treatment targets both the host organ of the erupted cyst, as well as to improve the secondary peritoneal outbreaks and its lavage with hypertonic saline of 20%.

The post-operative follow-up interval in our case is quite low, but still, given that the rate of increase in size of the parasite depends also on the resistance of the surrounding tissues (minimum resistance in free peritoneum), a possible secondary hydatidosis could be evidenced by ultrasound or CT within 6 months after the onset.

Also, based on the presented experience, we consider that the peritoneal cleaning with hypertonic saline and the early and prolonged prophylaxis with anthelmintics may be salutary in order to avoid secondary echinococosis.

The diagnosis of hydatid cyst must be considered especially in endemic regions with a history of rearing livestock or owning pets, whenever a cystic mass is felt in the abdominal cavity [23].

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# RECOMMENDATIONS REGARDING THE NUTRITION OF PRESCHOOLERS

**D.T. Anton-Păduraru[1], A. Marin[2], Ş. Dupa[3], A.S. Drochioi[1]**

**Abstract**

Nutrition plays a role in child's growth and development, and it is also a source of social interaction through verbal and non-verbal communication that contributes to psychosocial and emotional development. Unhealthy food habits can affect child growth and may increase the risk of chronic illnesses, while proper nutrition can prevent various conditions. Preschool period is characterized by moderate food consumption in line with slower growth rates, periods of lack of interest in food or resistance to new foods. Preschoolers require a customized diet according to the needs of this period and their characteristics, based on the same principles as adult nutrition but with a different nutrient requirement. Energy and nutritional needs are higher than those of the adult because they have to cover the needs for growth and development. In this paper, the authors want to show the current nutritional recommendations specific to the pre-school period, because promoting healthy eating habits as early as possible in life is very important.

**Keywords:** preschooler, nutrition, recommendations.

**Introduction**

According to the World Health Organization (WHO), proper nutrition combined with regular physical activity is the basis of good health. Nutrition plays a role in child's growth and development, and it is also a source of social interaction through verbal and non-verbal communication that contributes to psychosocial and emotional development.

Proper nutrition is important in preventing various conditions such as small height, delayed puberty, nutritional deficits, dehydration, eating disorders, etc. Preschoolers require a diet tailored to the needs of this period and their characteristics, being more independent in choosing the type and quantity of food. Preschool nutrition - also called the "golden age of childhood" - is based on the same principles as adult nutrition, but nutrient needs are different. Preschool period is characterized by moderate food consumption in line with slower growth rates, periods of lack of interest in food or resistance to new foods [1]. It's the period when:

-children do not always eat all groups of foods. Selective nutrition or refusal to eat occurs for various reasons: neophobia, when they associate a food with an unpleasant object (for example, pasta can be seen as similar to worms), "contamination" of a food with another that the child does not accept, lack of availability for the child of food to touch or play to develop self-sufficiency, negative eating experiences (the child is forced to eat, he is punished, he feels pain because of the gastro-oesophageal reflux, he has mouth sensitivity);

- the child consumes high quantities of liquids and semi-liquid food;

- the selection of food is restricted due to food insecurity, food allergies / intolerances of cultural reasons.

Other more common nutritional problems encountered in preschool children are:

- growth disorders (malnutrition, malabsorption);

- iron anaemia due to excessive consumption of cow's milk or unbalanced diet;

- caries especially in children from low-level social-economic families who use the bottle for a long time or who frequently consume sugars and carbonated beverages;

- gastro-oesophageal reflux;

- constipation due to insufficient fibre intake, allergy to cow's milk protein, emotional problems;

- diarrhoea due to increased consumption of fruit juice containing large amounts of non-absorbable monosaccharides and oligosaccharides or due to milk cow's protein allergy [2].

Dietary food habits that are established since early stage persist during adulthood. Unhealthy eating habits can affect child growth and increase the risk of chronic illness (cardiovascular pathology, obesity, diabetes) [3].

**Nutritional recommendations**

Preschool children should eat various food daily, 3 main meals and 2 snacks that take an adequate time (if the meal lasts less than 10 minutes, the preschool child does not have enough time to eat, and if it lasts more than 30 minutes, the meal can turn into something boring). We think that a meal should last 15-20 minutes and the child will be able to eat again at the next meal or snack [4,5].

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The advantages of serving 3 meals and 2 snacks are:

-prevents eating less nutritious foods throughout the day

-prevents the feeling of hunger or thirst that may occur in a longer period between meals.

Breakfast - considered a nutritional marker of healthy lifestyle, it must be the most important meal of the day to provide the energy and nutrients needed by the body after the night's rest (calcium, iron, B-group vitamins). Breakfast provides the feeling of satiety in the first part of the day and helps to limit the consumption of food in the second part of the day. It also helps to keep the blood sugar within normal limits. Having breakfast has positive effects: better weight, better nutritional intake, better memory and better attention. Instead, giving up breakfast has negative effects on cognitive, psychosocial, attention, school performance, and attendance at the kindergarten.

Lunch contributes to adequate caloric and nutrients intake. Dessert is part of the meal and it should not be more desired or expected than the meal itself. It is preferable to have healthy, home-made desserts.

Snacks are important as they provide energy intake, but sugar-rich snacks that reduce appetite and increase the risk of caries should be avoided. The ideal snack has to provide proteins, carbohydrates, calories, vitamins, minerals, fibre (e.g. yogurt, fruit, nuts and seeds). Snacks must be planned 2-3 hours before the main meals [4]. Consuming 2 snacks in addition to the 3 main meals provides children with calories and nutrients in adequate portions, daily.

Preschoolers requires the same nutrients as the adult, but they need higher calories intake compared to their body weight. Energy and nutritional needs are higher compared to the adult ones because they need to cover the process of growth and development [6,7]. Children are not miniature adults: they grow and develop at a faster pace and require more energy compared to adults.

The calorie requirement (CR) in preschool is calculated using the formula:

CR (kcal/day) = 1000 + 100 x age (years)

It varies between 1300-1600 kcal/day or 90 kcal/kg bodyweight or 16 kcal/cm height (8, 9). Compared to the adult requiring 30-35 kcal/kg bodyweight, preschoolers require a higher amount compared to their size due to the rapid growth and the fact that they are very active.

The main nutrition principles in a balanced diet should be:

-proteins: 15-18% of the calorie requirement, of which 2/3 animal protein [6].

-carbohydrates: 55-60% or 10 g/kg bodyweight/day.

-fats: 25-30% or 2-3 g/kg bodyweight/day (essential fatty acids 1-3 % of the CR); saturated fatty acids 10%, mono non saturated fatty acids 10%, polynonsaturated fatty acids 10%, linoleic acid 5-8 g/day or 4-10% of the calories, alpha-linoleic acid 0.5-0.8 g/day or 0.4-1% of the calorie intake, omega-3 fatty acids 40-55 mg/day).

A fatter diet is recommended for this age group because fat is needed for the growth and development of the nervous system.

It is considered that a diet in which 25-30% of calories come from fats and where saturated fats are below 10% is safe and appropriate for healthy children. It is advisable not to consume fish that may contain mercury (shark, swordfish) or fish oils that may contain dioxin and polychlorinated biphenyl.

Proteins - components of all cells, play a role in the development of metabolic processes, in adjusting the osmotic pressure and the acid-base balance, in the good functioning of organs, in growth and development, as well as in energy. Proper protein consumption is associated with a lower risk of disease and a shorter duration of the same. Protein deficiency accompanied by inadequate energy intake leads to protein-calorie malnutrition [10].

Child Nutrition Guidelines recommends a balanced diet based on 4 food groups:

-group 1: providing good sources of energy, carbohydrates, fibre and vitamins from group B;

-group 2: offering a variety of fruits and vegetables that supply vitamin A, iron, zinc, and fiber. According to WHO, the daily fruit and vegetable intake for EU Member States should be 400g/day [11]. Exposing the infant and toddler to fruits and vegetables is associated with their acceptance in the following periods of life. Fruit consumption is preferable to the consumption of fruit juices that are high in sugar and low in fibre. Cooke and Wardle quoted by Cupples Cooper have shown that exposing children to a variety of fruit and vegetables during their pre-school life leads to an increase in their consumption over the course of their lives [12].

-group 3: containing sources of protein, calcium, vitamin A and calories;

-group 4: containing sources of protein, iron, zinc [13] - table 1.

A balanced diet containing foods from all major groups also ensures the need for vitamins and minerals - table 2.

Under 5 years of age, vitamin supplementation is recommended in children who do not eat properly for a long time, consuming a limited number of foods that are restricted or vegetarian, who have food allergies or intolerances.

WHO said that 190 million preschools worldwide have vitamin A deficiency, which is necessary for growth and infection control. In places where vitamin A deficiency is a public health problem, it is recommended that children under 5 years of age receive vitamin A supplements to reduce morbidity and mortality. A vitamin A 200,000 IU dose in children between 1-5 years provides adequate protection for 4-6 months, the exact range depending on the vitamin A diet and the rate of use. The daily menu must also contain: vitamin D 400 IU, folic acid 200 μg, vitamin C 35 mg, group B vitamins, also calcium 500 mg and zinc 4-6.5 mg [14].

**Table 1.** Recommended food groups in the preschoolers' diet.
(according to https://www.mayoclinic.org/healthy-lifestyle/childrens-health/in-depth/nutrition-for-kids/art-20049335)

| Group 1 | Group 2 | Group 3 | Group 4 |
|---|---|---|---|
| - bread<br>- rice<br>- potatoes<br>- pasta<br>- grains<br>-starch-containing food | - fruit<br>- vegetables<br>-green vegetables | - milk<br>- dairy | - meat<br>- fish<br>- egg<br>-other non-dairy protein foods |

**Table 2.** Necessary intake of vitamins and oligo-elements in preschoolers (according to Graur Mariana).

| Oligo-element / vitamin | Required intake |
|---|---|
| Iron (mg) | 7 |
| Zinc (mg) | 7 |
| Iodine (μg) | 90 |
| Copper (mg) | 1.1 |
| Fluorine (mg) | 1 |
| Selenium (μg) | 30 |
| Vitamin C (mg) | 75 |
| Vitamin B1 (mg) | 0.6 |
| Vitamin B2 (mg) | 1 |
| Vitamin B3 (mg) | 8 |
| Vitamin B6 (mg) | 3 |
| Vitamin B8 (μg) | 20 |
| Vitamin B12 (μg) | 1.1 |
| Vitamin A (μg) | 450 |
| Vitamin E (mg) | 7.7 |
| Vitamin D (μg) | 5 |
| Vitamin K (μg) | 20 |

The intermittent iron supplementation (30 mg of elemental iron, 3 consecutive months) is recommended as a public health intervention in preschool children to improve the status of iron and reduce the risk of anaemia in areas with an increased incidence of the same [15,16].

Potassium is required to maintain the total volume of fluids, the hydro-electrolyte balance, and the normal cell function. It is contained in unrefined foods, especially fruits and vegetables (600mg/100g nuts, green vegetables - spinach, cabbage 550 mg/100g, bananas, dates, tomatoes, cucumbers 300mg/100g). Food processing decreases potassium levels, and the diet rich in processed food and low in fruits and vegetables also contains small amounts of potassium [17].

With regard to fibre consumption, while more fibre and fewer fats are recommended for an adult, in pre-schoolers, due to their smaller stomach volume, the consumption of a large amount of fibre would quickly lead to a feeling of fullness, decreased absorption of nutrients, diarrhoea and other gastrointestinal symptoms. Therefore, the recommended fibre intake for preschoolers is 14-18 g/day [9].

The need for liquids is 80 ml/kg bodyweight/day or at least 6-8 glasses x 100-120 ml [6,13]. The fluid intake must be increased during the warm season and during physical activities. Excessive fluid intake can reduce fibre and iron intake. Fluids include water, mineral water with a sodium content below 20 mg/l, unsweetened milk and fruit juices. Avoid carbonated beverages, excess tea (it contains tannin interfering with iron absorption), coffee and Coca Cola (containing caffeine) [18]. Water and milk are the safest beverages that can be offered between meals as they do not cause erosion and dental caries. However, more than 3 servings of milk per day may reduce the appetite for other foods [19]. Energy drinks are not recommended to preschoolers because of the increased sugar content (15 teaspoons/600 ml) and caffeine. It is necessary to limit the consumption of foods containing caffeine because the exposure to 2.5 mg caffeine/kg bodyweight has toxic effects. Chocolate contains 10 mg caffeine/50g, tea 55 mg/250 ml, energy drinks 72 mg/250g [18]. A maximum of 125 ml of 100% natural fruit juice is recommended as part of a meal or snack, but it is best to have whole fruit and vegetables (1). Water is recommended to reduce the acidity and sugar content of fruit juices, diluting them by 1:1, and given only during a meal.

Daily recommended salt intake is 1-1.5 g (400-600 mg sodium), not exceeding 3 g (1.2 g sodium). Therefore, recommendations are as follows:

-do not add salt to food;

-reduce the consumption of processed foods, sauces, ready-made soups;

-limit the consumption of snacks that are rich in fat, but poor in nutrients;

-use natural flavouring spices [2, 9, 13].

Foods with high sodium content are: soy sauce (7000 mg/100g), bacon (1500 mg/100g), cheese (800mg/100g), butter and margarine (700 mg/100g), fish (100mg/100g), processed meat, corn flakes [20].

It is recommended to limit the daily sugar intake to 8 teaspoons (one teaspoon = 5g) [9].

The serving size depends on age: for example, for 3-year-old children, 1 serving = ½ of the one recommended for 5-year-old children. Serving size increases as the children grow up, as well as the calorie and nutrient intake. It is not necessary for a preschooler to eat the recommended nutrient intake every day: one day he can eat more, other day he can eat less, depending on the foods offered, but the necessary intake for a period of 2 weeks must be covered by a balanced diet [2].

**Conclusions**

1. Promoting healthy eating habits from early ages is very important.

2. Early food experiences may have long-term consequences on eating habits and food preferences.

3. Preschoolers must learn to eat healthy foods and make the right choices with the help of parents and educators.

4. Parents should be educated on the size of the servings for preschoolers, compared to the ones for adults.

5. It is necessary to publish specific national nutrition guides for different ages, easy to understand and be applied by the parents.

**Conflict of interests**

The authors report no conflicts of interest.

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# CONSERVATIVE VERSUS INVASIVE TREATMENT IN NASOLACRIMAL DUCT OBSTRUCTION IN CHILDREN

**Roxana Calmuschi(Trinc)[1,2], Sorin Trinc[2], Afilon Jompan[3]**

**Abstract**

In the literature there is no consensus between the benefits of conservative or interventional treatment in the NLDO, and in our country there has not been published a protocol for the diagnosis and treatment of this condition. Conservative treatment involves local application of ocular pharmacological preparations that treat inflammation and / or conjunctival secretion. Antibiotics are administered according to the susceptibility of germs presented by microscopic and bacteriological analysis of conjunctival secretions. An important factor in conservative treatment is the massage of the lacrimal sac and lacrimal canaliculi, hydrostatic massage, the principle of which is to increase the mechanical pressure at the level of the lacrimal ducts and to push a potential obstacle in the lower part of the tear duct. Treatment by lacrimal probing can be done from the age of 3-4 months, even in the ambulatory, without anesthesia or by instillation of local anesthetics. If the procedure fails, a silicon of lacrimal pathways can be done in collaboration witn ENT specialist, a dacriocistorinostomia, canaliculo cistorinostomia or conjunctivocistorinostomia, procedures that cannot be done in acute dacriocistitis. In this study we analised the cases treated in Ophtalmology Departament of SCJU Arad between 2016-2017 (115 patients, 135 eyes, patients aged between 0,5-36 months), diagnosed with NLDO and treated by different modaklities. We obtained best results by conservative treatment.

**Keywords:** nasolacrimal duct obstruction, nasolacrimal probing, massage, silicone intubation, dacriocistorinostomia.

**Introduction**

Approximately 40% of infants have symptoms of NLDO. It is usually caused by the persistence of a diaphragm in the lacrimal duct. Children have epiphora due to the blockage of the lacrimal duct and lacrimal purulent secretions caused by bacteria from normal skin flora. The infection of lacrimal secretions results from the bacterial proliferation in the lacrimal sac. By far the most common confusion is with infectious conjunctivitis, although in the case of the latter both bulbar and palpebral conjunctiva suffer obvious changes. Usually the general practitioner and the pediatrician recommend local antibiotics without specific NLDO treatment and some ophthalmologists ignore the importance of the conservative procedures by recommending invasive maneuvers.

**Purpose**

In the literature there is no consensus between the need for conservative or interventional treatment in NLDO (nasolacrimal duct obstruction), and in our country there has not been published a protocol for the diagnosis and treatment of this condition. In many cases the conservative treatment is more effective than interventional treatment and the latter is used in complicated cases, Also, the collaboration between the family doctor, ophthalmologist and ENT specialist is not well established in this cases. The aim of this study is to promote the elaboration of a treatment protocol in cases of NLDO in children and to analise our experience in treating this condition by conservative or invasives procedures.

**Matherials and methods**

In this study we analised the cases treated in Ophthalmology Department of Arad County Hospital between 1.01.2016-31.12.2017 (115 patients, 135 eyes), aged between 0,5—36 months, diagnosed with NLDO and treated by conservative or invasive modalities. Inclusion criteria were the lack of topical antibiotics administration or other ophthalmological treatment in the previous 14 days, the absence of other congenital or acquired ophthalmological affection. The consent of the Ethical Department of Faculty of Medicine, UVVG Arad was obtained.

**Results**

We treated NLDO by conservative methods wich involves topical instilment of ocular pharmacological preparations that treat inflammation and / or conjunctival discharge. Antibiotics were administered according to the susceptibility of germs present in the microscopic and bacteriological analysis of conjunctival mucopurulent material. Parents were warned that the application of antibiotics will not lead to the treatment and cure of NLDO, but will only reduce conjunctival discharge and alter its appearance. An important factor in conservative treatment was the massaging of the lacrimal sac and lacrimal canaliculi, also called hydrostatic massage, the principle of which is to increase the mechanical pressure at the level of the lacrimal ducts and to push a potential obstacle in the lower part of the tear duct.

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The massage was done with the index finger after the administration of antibiotic drops into the conjunctival sac and consists of applying pressure on the lacrimal sac targeting on the lacrimal pathway. This technique was first described by Crieger in 1923. There are divergences in terms of duration of conservative treatment. Some authors (2), (3) recommend a short, even minimal period, in order to prevent the infection of the lacrimal ways and the fibrosis of the walls. Others (Olver, 2) support spontaneous permeability of lacrimal pathways at variable intervals during the first months after birth, with permeability results of 96% in the first year of life and 60% in the second year. According to Patriney and Anderson, 50-75% of cases show reperfusion with conservative treatment of 95% up to 3 months and 95% up to 8 months (3). Noda et al. published the release of lacrimal canaliculi in 2/3 of cases up to 2 months after birth and in 100% of cases conservatively treated up to 9 months (5). Nucci et al. reported 93% repermeabilization in the 1-12 month group with conservative treatment and 79% in the 13-24 month group. (6) Pettersen and Robb support spontaneous recovery in 89% of cases up to 12 months, and after (7) Katowitz recommends conservative treatment for at least 6 weeks and Anders at least 12 weeks (6). Young and co. show a possibility to continue conservative treatment in the second year of life with good results (9), and Takahashi and colleagues in the study "Wait and see" support very good results through conservative treatment in the first 12 months of life (10). Conservative treatment should be followed for at least 3-4 months after the onset of symptoms. We recommended conservative treatment in 102 patients with NLDO (75,5%).

Treatment by lacrimal probing can be done even in the ambulatory, without anesthesia or by instillation of local anesthetics. The children were fully immobilized, in a dorsal position, held by one or two persons or wrapped in a durable material. It was important to immobilize their head. At the tear point of the lower eyelid, a Bowman 2mm vertical probe was inserted after pre-dilatation so that laterally it is aligned parallel to the free edge of the lower eyelid, while the eyelid is laterally towed. On the tip of the probe methylcellulose can be applied for additional lubrication and to prevent tearing of the walls of the tear ducts. It is injected through a syringe attached to the physiological saline probe, and fluid pressure is designed to remove possible obstructions formed by secretions and thin membranes. During the procedure, resistance points could be encountered:

-12mm from the lacrimal points, at the border between the sac and the lacrimal canal;

-20mm from the tear points when meeting the wall of the nasal bone.

If the first probing procedure was unsuccessful due to the lack of lacrimal fluid washing at the level of nasal nostrils, a new approach was scheduled in 3-4 weeks and the second intervention had a lower success rate estimated at 70-80%(6). We recommended lacrimal probing in 31 cases of NLDO (22,9%), with second reintrevention in 6 cases (19%).

After this procedure, antibiotic and local steroids was administered for 5-7 days, combined with hydrostatic massage. If the second intervention proved to be unsuccessful, the patient still presenting symptomatology and the impermeability of the NLDO, the diagnosis was under the "congenital" category and the collaboration with the otorhinolaryngologist with endoscopic treatment through the nasal nostrils with fracture of the lateral nasal wall was essential. During nasal endoscopy when treating lacrimal canaliculi obstruction, situations can be encountered:

- endonasal probe locks in the mucosa that covers the lacrimal hole or is minimal in size;
- the probe remains under the endonasal mucosa;
- the probe does not penetrate the blockage.

If the NLDO symptoms persisted after the second probing, we intubated the lacrimal pathways. It is a maneuver that is carried out in the complex congenital diseases of the lacrimal pathways, in case of failure of the conservatory therapy or in unsuccessful repeated probing procedures. The efficiency of the method is 85-95%(8). The silicon tube inserted into the tear paths prevents stenosis, wound formation and allows the normal tear drainage. There are sets of mono or bicanalicular intubation. They are silicone tubes with a diameter of 0.6-0.9 mm. The intervention was performed under general or local anesthesia. Successful laceration of the lacrimal tract was performed and the probe insertion was executed endoscopically at the nasal fossa using a metallic guide wire which was withdrawn after placing the silicone tubes.

There are several types of intubation techniques for lacrimal pathways:

- Quickerta and Dryden technique which uses probes with a 12-14mm length, with a conical end, curved or straight. At the end of the probe there is a silicon wire used for the landmark;
- Crawford technique that uses a tear intubation set consisting of two metallic threads of 11.5-14 mm length linked to silicone fibers, requiring a special insertion hook.
- Bowman technique, when the tubular needle technique that uses a tubular needle with a 0.7 mm outer diameter, with a blunt end, two sleeves and silicone fibers, with a length of 3cm.

We performed silicone intubation in 2 patients with NLDO, (1,41%) - Quickerta and Dryden technique, with removal of the tubes in 3 months.

Silicone intubation of lacrimal pathways was maintained for several months, usually the fluorescein dye disappearance test (FDDT) was positive, and after removal of the probes, symptoms did not return. If the FDDT is negative while maintaining the probe, the stent can last for 6 months or longer. After the removal of the stent, antiseptic and antibiotic treatment combined with steroids for 5-7 days and hydrostatic massage are recommended.

-dilatation with balloon which is a recommended method in case of failure of conservative treatment, hydrostatic massage, and when there is suspicion of incomplete strictures of the tear ducts. A balloon catheter was introduced into the lacrimal pathways, and then inflated for 90 seconds at 8 atmospheres. These maneuvers can be

repeated after 60 seconds. After dilating the lacrimal pathways, FDDT was positive. The advantage of this method was simplicity and efficiency, and the disadvantage was related to the high cost of the balloon catheter.

*Dacriocistorinostomia (DCR)*

Unsuccessful intubation of the lacrimal pathways leads to DCR with positive functional outcomes in 85-99% of cases (4). Favorable results are particularly encountered if the obstacle is in the lacrimal sac or under the lacrimal sac. The basic condition for choosing DCR is the existence of at least one permeable upper tear path. The absolute contraindication is the presence of a malignant tumor of the lacrimal sac, in which case dacriocystectomy is selected and then canalicirinostomia or conjunctivorinostomia. The intervention is carried out in reverse Trendelenburg position, with the head being higher than the pelvis. Endoscopic examination of the nasal cavity and assessment of the condition of the lateral walls of the nasal septum are necessary. The location of the lacrimal sac is determined by translucency, the method in which the light optical fiber is inserted into the lacrimal channels, the lacrimal sac, and the visible endoscopic illumination in the nasal cavity indicates the position. Another method of determining the location of the lacrimal sac is to probe the lacrimal pathway and penetrate into the sac and on the other hand to make contact between the sac sample and a forceps inserted through the nasal cavity. After approximating the position of the lacrimal sac, a flap of the nasal mucosa is removed, a hole in the lateral nasal bone is re-opened, the lacrimal sac is highlighted and its suture is extracted from the endonasal mucosa. To increase the effectiveness of the DCR, the head of the middle cornet is resected. Anastomosis is cured in about 8 weeks. To reduce the amount of stenosis, silicone stents can be inserted into the lacrimal channels and in the lacrimal sac of anastomosis with the nasal mucosa, which can be removed after 2-4 months.

*External Dacriorinocistostomia*

It is a recommended procedure for children aged 3-4. It has multiple disadvantages to endonasal DCR: the risk of bleeding during surgery, increased duration of surgery and aesthetic disadvantages. There is lack of endonasal approach and lateral nasal bone wall is fractured after external exposure. Postoperative inflammation is intense and bloating in the post-operative period may lead to intense palpebral emphysema.

*Laser Dacriorinocistostomia*

It has a good coagulating effect. The approach consists of nasal endoscopy and use of laser Yag, Diode, Nd: Yag.

*Canaliculocistorinostomia*

It is a procedure that involves avoiding an intrasacular or subsacular blockage. The operation can only be done externally, and involves the connection of the lacrimal channels to the nasal mucosa.

*Conjunctivocistorinostomia*

It is an intervention that can be achieved in the case of a DCR or canaliculocistininostomy that is unsuccessful. It is performed in patients over 12 years of age and involves a tear drainage between the conjunctival sac and the nasal cavity. The contraindications are closure failure, early age, lack of motivation and patient compliance. The complications of conjunctivistinostomy are related to intraoperative bleeding and periocular granulation at the end of the silicone stent. Interventions involving anastomosis between the lacrimal pathways and the nasal mucosa are problematic in the case of acute dacriocytosis. According to some authors, this is not a contraindication to DCR (). Narrow nasal cavity in children is prone to postoperative adhesions, so intubation of the lacrimal canaliculi is mandatory, thus leading to unhealthy healing even under tissue inflammation. Welham and Huges describe 93% (12) and Nowinski et al 88% (13) cases with FDDT positive and symptomatology absent after DCR in case of acute dacriocystitis. In our study we did not recommended surgical invasive procedures in collaboration with the ENT specialists.

**Discussions**

In our ophthalmology department, the conservative technique for NLDO was used in 75,5% cases, while the interventional methods (probing and silicone tubes) was used in 22,9% cases. We started the treatment with conservative methods in all the patients, and in those with no therapeutic response we performed the lacrimal pathways probing or silicone intubations. We notice that in those patients with aqueous lacrimal secretions the conservative treatment was efficient in all cases, while in those patients with purulent secretions and late presentations after the onset of the lacrimal symptoms the lacrimal probing was indicated. The differentiation criterias are the aspects of the lacrimal secretions, the delay between the presentation and the onset of the lacrimal simpoms, and the age of the patient. Our results are comparable with similar studies from other countries. We did not used large surgical procedures in collaboration with ENT specialists, due to the fact that we did not have presentations in late stage of disease or children over 36 month of life, when the rate of complication is higher,

**Conclusions**

Most of the children with NLDO can be treated with conservative methods even in the general practice doctor's consultation rooms or in pediatrician ambulatory. We insist over the role of the recommendations given to the parents of the patients with NLDO. In incipient cases, the most efficient treatment is local saline solution washout and lacrimal duct pressure. In late presentations, the optimal therapeutic method is local lacrimal duct pressure with nasolacrimal probing, with or without antibiotic instillations. The nasolacrimal probing technique can be done in ophthalmology consultation room, but its benefits are inferior to its costs and trauma for the little patients.

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# THE PREVALENCE OF BOLTON DISCREPANCY IN ROMANIAN TEENAGED ORTHODONTIC PATIENT

**Anca Stefania Mesaros[1], Roxana Oancea[2], Aranka Ilea[3]**

**Abstract**

The patients present themselves in the dental office demanding a perfect Smile. The orthodontic specialists have a role in creating this perfect Hollywood smile by orthodontic treatment. However, to do this, there is a need to do a thorough assessment of each case in order to place a correct diagnosis and present the proper treatment plan. The presence of a Bolton discrepancy changes the treatment plan. The present study wishes to determine the prevalence of Bolton discrepancy in a group of Romanian teenaged population. Measurements were done of dental casts for 50 patients and questioners regarding the preferences in the therapeutic approach of Bolton Discrepancy cases were distributed to Orthodontists. The results revealed a high prevalence of Bolton discrepancies among the studied population as well as a lack of consensus for a protocol in management of such patients by the orthodontists, an individualized approach being preferred.

**Keywords:** orthodontic therapy, teenager patient, Bolton discrepancy

**Introduction**

Aesthetics has been, is and will continue to be a concern of modern man, having its origins since antiquity.

Since ancient times, teeth have been elements of beauty, youth, power, not only through their presence, but also through their integrity. There are some researches that prove the existence of certain practices of human dental care, most often of a religious and social nature. [1]

Aesthetics is defined as the science that studies the category and laws of an art, a form of reception of beauty, concerning the essence of art, the relations with the reality and the method of artistic creation. [2]

Dental aesthetics derives from the study of dental and facial morphology, representing a branch of aesthetics as a whole. There are no rigid and objective rules regarding dental aesthetics, subjectivism having here a major role, which is perceived differently by each individual. [3-5]

Dental aesthetics always represent a challenge for the dentist in trying to create smiles as close as possible to perfection, but also naturally. The smile represents a means of communicating with people around and can add a pleasant or less pleasant note to a conversation.

Orthodontists, like doctors of other specialties, have taken on this duty of improving dental aesthetics, by trying different ways to achieve the expected results, but working only with the patient's biologically available material. It is necessary to consider various new measurements, individualizations and knowledge to fully meet current needs and requirements.

Orthodontic treatment not only involves the alignment of teeth, but also a whole complex of phases with unique challenges and features. An important phase is the finishing, characterized by a multitude of details needed to reach the desired result.

In many situations, this end point is difficult to reach, requiring some biomechanical forces to achieve an orthodontic solution. Much of these situations arise from the error of diagnosing dental annomalies at the start of treatment as early as the initial diagnosis phase.

The analysis of the required or offered space in orthodontics is an important step in deciding how to achieve that space by eventual extraction.

Consequently, in order to gain a functional occlusion, mandibular and maxillary teeth should be proportionate in size.

Bolton's analysis is an important stage of any orthodontic treatment and is used by simply measuring mesio-distal dental diameters. In 1958, Wayne A. Bolton laid the foundation for this analysis, four years later, he continued to explain the importance and clinical applicability of his Orthodontic analysis. In present times, it is one of the most popular methods for determining tooth size abnormality[5].

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The overall Bolton ratio is the percentage obtained by summing the widths of the 12 mandibular teeth divided by the sum of the widths of the 12 maxillary teeth and should be 91.3 ± 0.26 per cent. Anterior ratio is the percentage obtained by summing the widths of the six mandibular anterior teeth divided by the sum of the widths of the six maxillary anterior teeth and should be 77.2 ± 0.22 per cent (Bolton, 1958, 1962)[6,7]. The original analysis, done by Bolton, was performed on 55 patients with excellent occlusion, including 44 orthodontically treated (non-extraction) and 11 untreated subjects. A ratio smaller than 91.3% would mean the mandibular teeth are smaller than normal. Anterior analysis follows the same principle. Having a different ratio than normal is referred to as Bolton Discrepancy. A standard deviation of more than 2 yields a significant discrepancy.

It would be ideal for Bolton's analysis to become a routine for the orthodontic treatment so that the results offered are used in the final treatment plan. It is recommended that it begin with the determination of the severity and location of the discrepancy, in order to decide whether or not to gain space in the opposite arch.

The aims of our study are to search for the prevalence of Bolton Discrepancies on a group of Romanian teenaged orthodontic patients and to emphasize the importance of the analysis for a correct orthodontic treatment.

**Material and methods**

The study group consisted of 50 pairs of cast models (25 from each gender), mandibular and maxillary models from patients who presented themselves in the dental practice for their initial orthodontic visit between October and December 2016 and which met the inclusion criteria:

- age between 12-18
- natural permanent dentition without any caries, fillings, prosthetics
- no extractions or stripping procedures prior to their visit in our office
- no genetic syndroms, facial dismorphism
- no facial trauma
- no surgeries in the oral region

The exclusion criteria were:

- People who do not integrate in the age range to whom the study is addressed
- Persons who have restorative or prosthetic works at the anterior teeth
- Temporary or mixed Dentition
- People who have a history of extraction or stripping
- People with facial, congenital, post - traumatic or post - surgical abnormalities

Mesio-distal diameters of anterior teeth were measured using a digital caliper for both upper and lower jaw models (Fig 1).


Fig nr 1- Dental casts and digital caliper.

Also, a simple multiple-choice questioner on therapeutical procedures used for the management of Bolton Discrepancy was also administered to 100 orthodontists.

Data was analyzed and interpreted doing a simple descriptive statistics using the Microsoft Excell Software and SPSS 13th edition software.

**Results**

The study showed that 70 percent of the studied population was presenting a Bolton discrepancy. Between the patients with Bolton discrepancy, 63,3% were female and 74% of the affected population was of mandibular excess. (Fig 2).

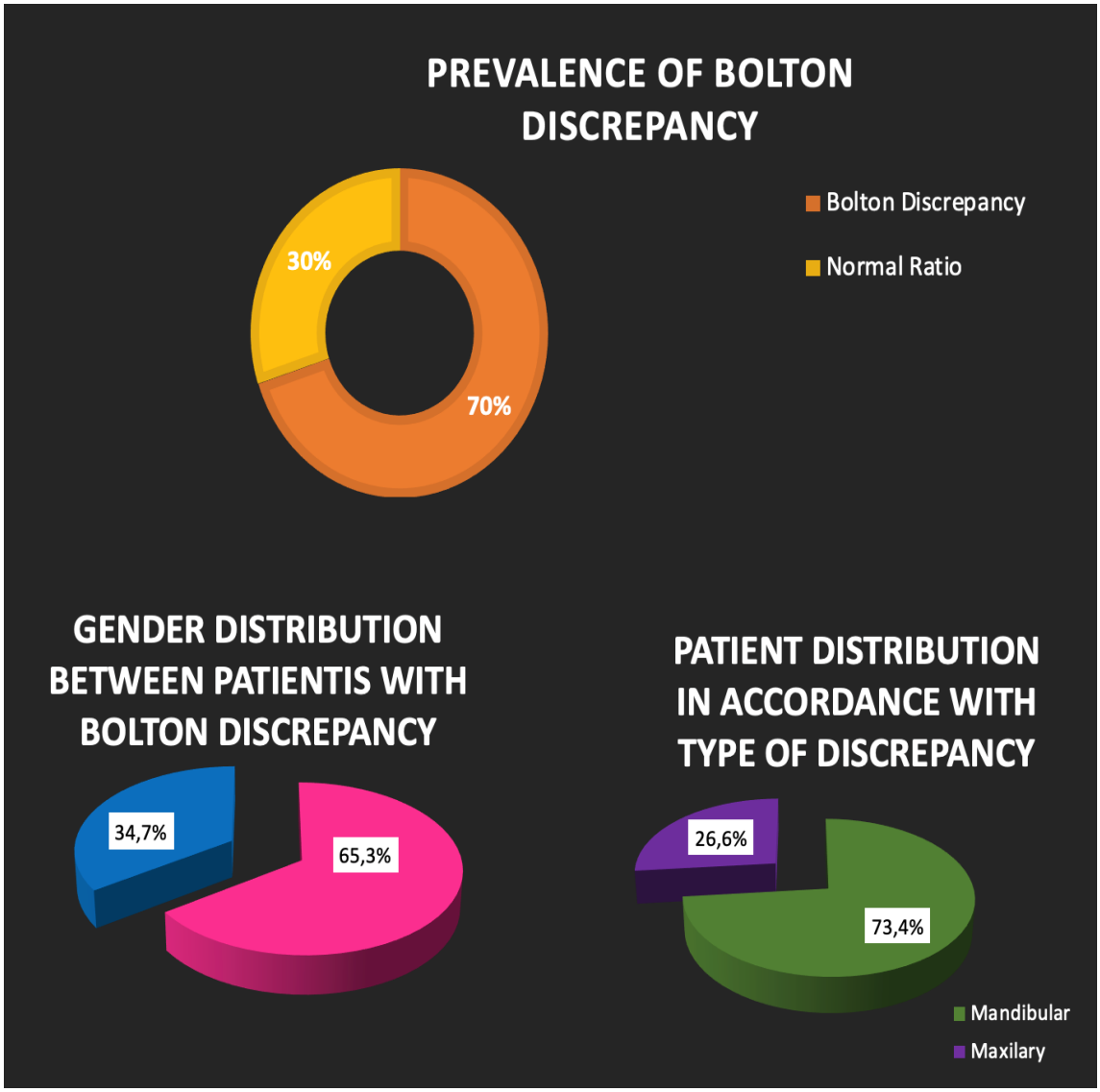



Fig 2. Prevalence of Bolton discrepancy among the studied population.

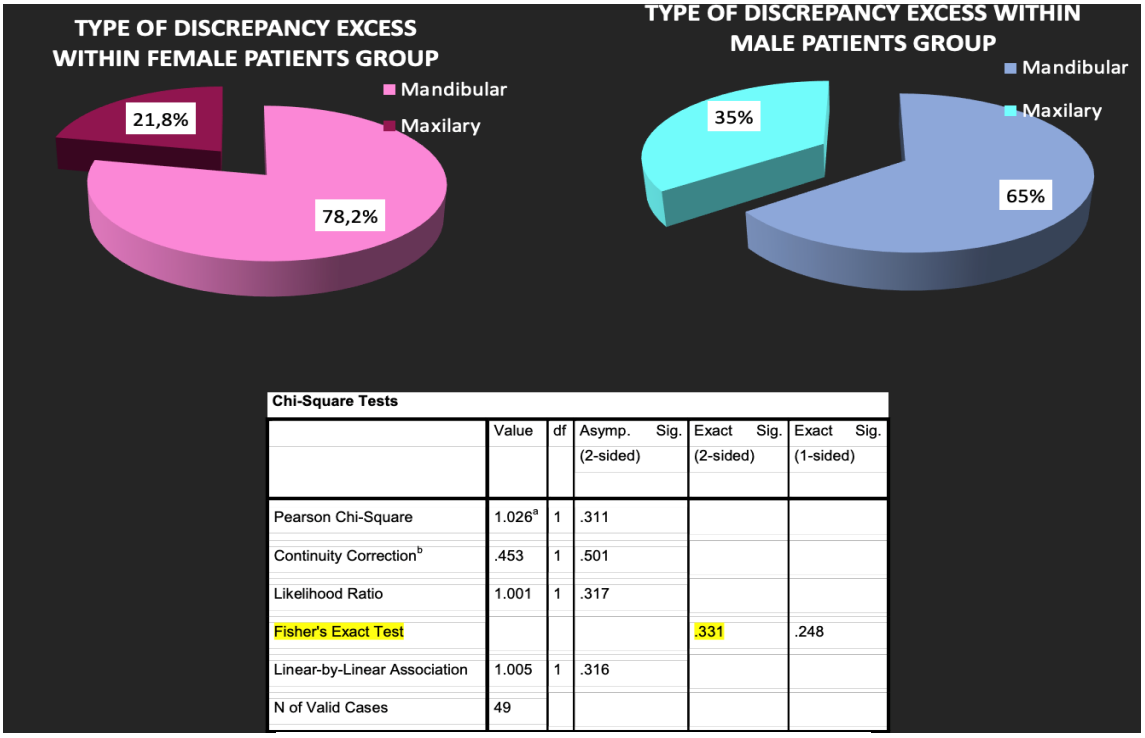
However, there is no statistically significant dependence relationship between the gender of the patient and the type of dental excess presented (Fisher Exact test: p = 0.331> 0.05). (Figure 3).

While assessing the gathered measurements, the mean values of the mesio-distal diameters of each anterior teeth was calculated and it is presented in Table nr.1. For the average values, an average of 79,12% of the anterior Bolton Ratio should be considered to be normal for the studied population.

While assessing the individual values of mesio-distal diameters of frontal teeth on the patients presenting Bolton distrepancy, a significant difference between the distribution classes of values was observed. Figure 4 presents the class distribution of values for teeth 1.1 and 2.1.

Most patients presenting with maxillary dental excess have values between 40.3-52.3 mm, with a Gaussian distribution, with minimum values of 40.3 mm and maximum 53.1 mm.

Most patients with mandibular dental excess have total dimensions of the excess type, located between 31.7-40.7 mm, with a Gaussian distribution, with minimum values of 31.7 mm and maximums of 43.3 mm.




**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | 1.026[a] | 1 | .311 | | |
| Continuity Correction[b] | .453 | 1 | .501 | | |
| Likelihood Ratio | 1.001 | 1 | .317 | | |
| Fisher's Exact Test | | | | .331 | .248 |
| Linear-by-Linear Association | 1.005 | 1 | .316 | | |
| N of Valid Cases | 49 | | | | |

Fig 3. The type of discrepancy excess related to gender.

| AVERAGES OF MD DIAMETERS OF FRONTAL TEETH AND BOLTON INDEX OF AVERAGES | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.3 | 1.2 | 1.1 | 2.1 | 2.2 | 2.3 | Max | |
| 7,7132 | 6,4966 | 8,438 | 8,5004 | 6,462 | 7,6282 | 45,953 | Bolton |
| 4.3 | 4.2 | 4.1 | 3.1 | 3.2 | 3.3 | Mand | 0,7912 |
| 6,844 | 5,812 | 5,4054 | 5,3826 | 5,8124 | 6,7848 | 36,323 | |

Table 1- Averages of mesio-distal diameters of frontal teeth and mean Bolton index value.

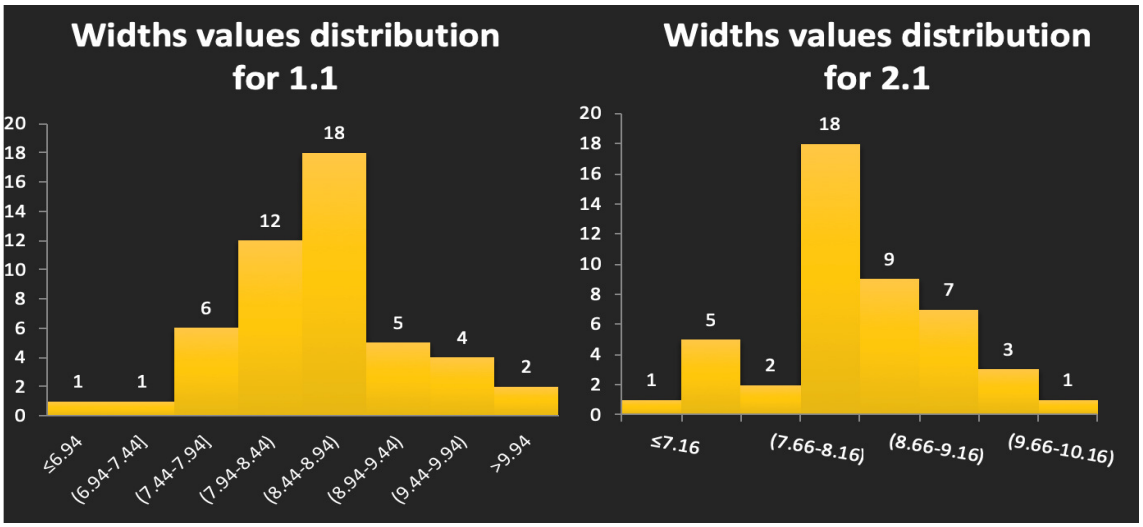



Fig 4. Class distribution of values for 1.1 and 2.1.

While trying to determine the correspondace with the golden ratio of the mesio-distal diameter dimensions of central incisors, an important discrepancy vas found as presented in figure 5.

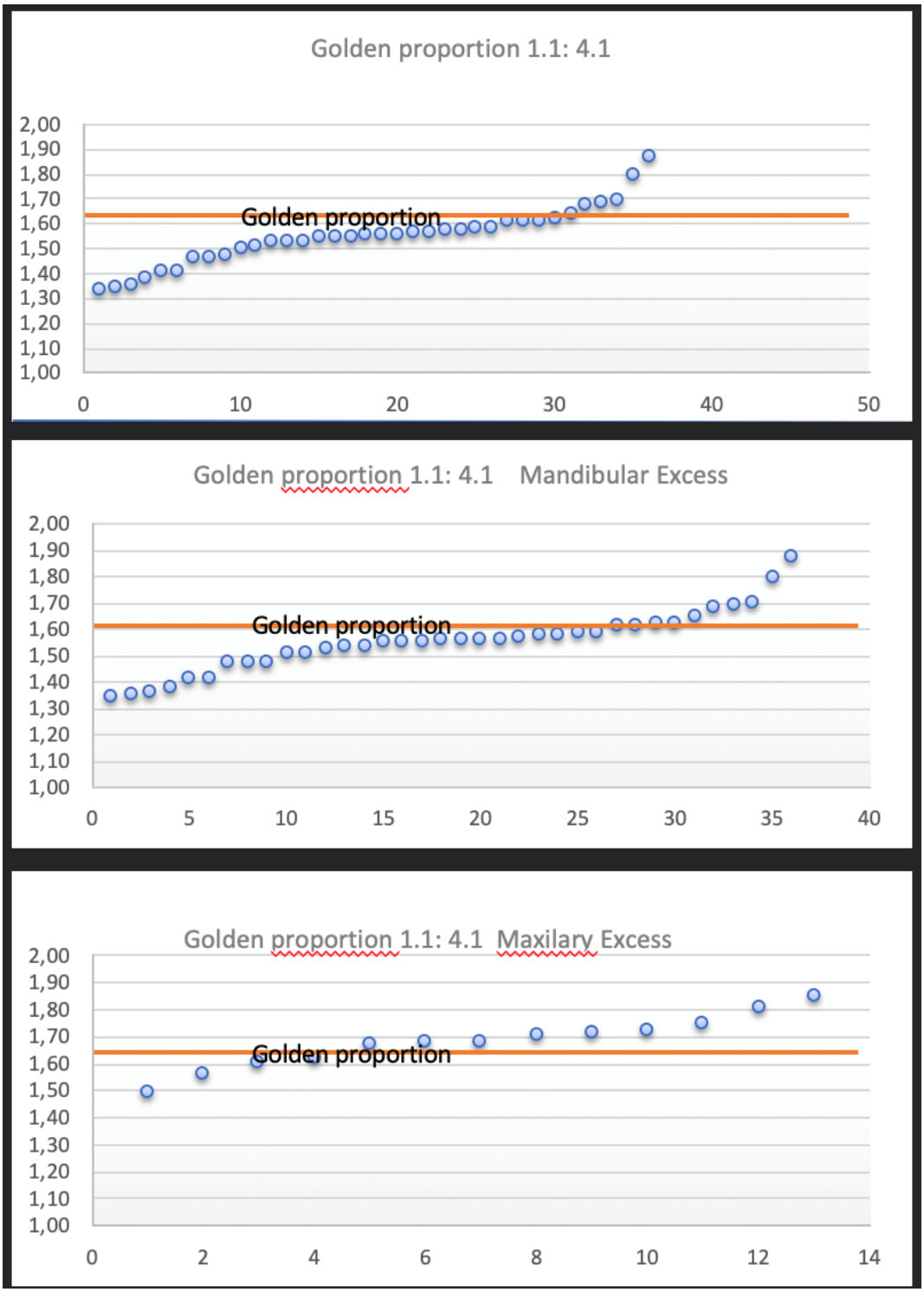



Fig.5.Distribution of individual ratos between dimensions of mesio-distal diameters of upper and lower incisors in regard with the golden proportion ratio.

As shown by the results of the first part of the study, there is a high prevalence of Bolton discrepancies among Romanian teenaged patients. In order to assess the management such cases we distributed a multiple-choice questioner to 100 orthodontists. As seen in Figure 6, there is no specific therapeutic approach for such cases, the percentages between the different approaches being similar. Also, many orthodontists could not specify a therapeutic approach as a general way of management, needing specific information for each case, to individualize treatment, specifications that were not available through our questioner.

However, we could observe that the therapeutic approach is quite different weather we have a maxillary or mandibular excess. If for maxillary excess, most of the orthodontists prefer individual assessment with more details, for the mandibular excess interproximal reduction (stripping) of enamel is preffered, as seen in Figure 7.

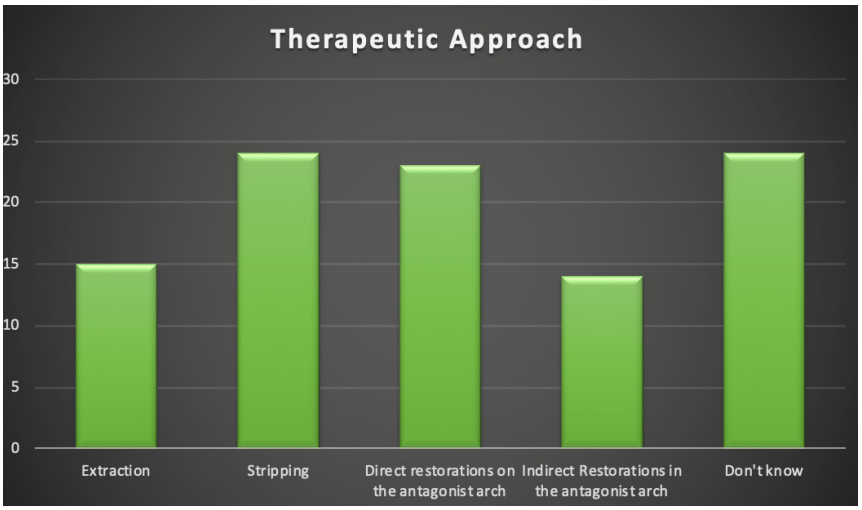



Fig. 6. Different therapeutic approaches preferred by orthodontists.

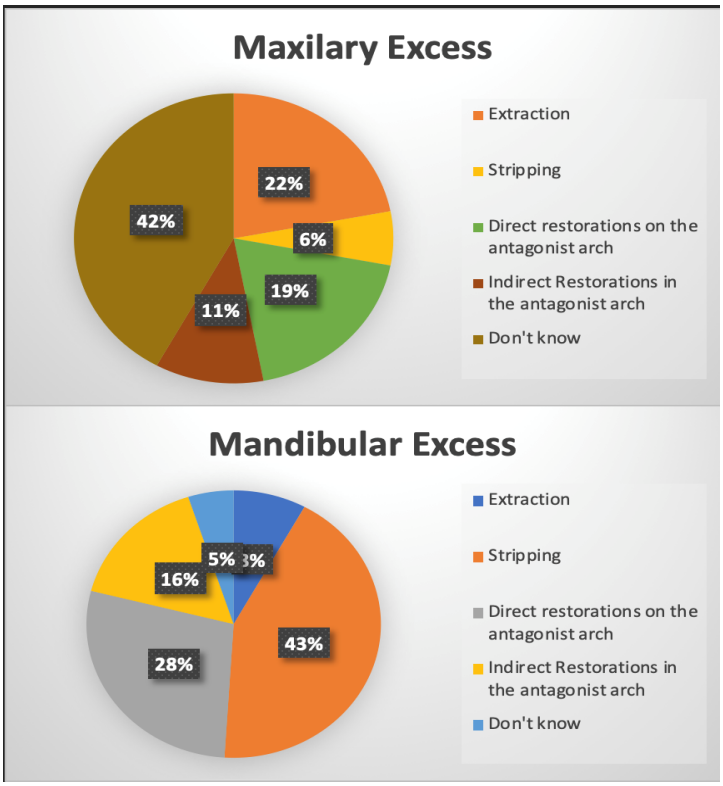



Fig. 7. Preferences in therapeutic approach in regard with Maxillary/Mandibular excess.

**Discussions**

Bolton suggested that a discrepancy greater than 1 SD may create clinical problems. Most authors define a clinically significant ratio as 2 SD outside Bolton's mean (Crosby and Alexander, 1989; Freeman *et al.*, 1996; Santoro *et al.*, 2000)[1].

Proffit *et al.* (2007) cited by Uysal et all [5] stated that a tooth width discrepancy larger than 1.5 mm creates problems that should be considered in the treatment plan. Most authors assert that a tooth size discrepancy, compared with Bolton's norm, greater than 1.5 mm, or 2 SD, results in difficulties in tooth alignment in the finishing phase of treatment (Crosby and Alexander, 1989; Freeman *et al.*, 1996; Santoro *et al.*, 2000; Araujo and Souki, 2003; Bernabé *et al.*, 2004; Othman and Harradine, 2007). No evidence has been found for the clinical importance of a discrepancy exceeding 2 SD or 1.5 mm and both values seem to be suggestions.

To ensure proper relations between arches and teeth (interdigitation, overbite, overjet), there has to exist a specific dimension for each element. Patients with inter-arch tooth-size discrepancies usually require special finishing (removal or addition of tooth structure). Bolton's analysis should be routinely performed in all orthodontic patients and the results should be properly used in the final treatment plan

The purpose of this study was to evaluate the size of the maxillary and mandibular frontal group, apply the Bolton formula and express its value, respecting the gold ratio, between 1.1 and 1.2, 2.1 and 2.2, 1.1. and 4.1, as well as 2.1 and 3.1, on a batch of subjects selected according to inclusion and exclusion criteria. The data obtained in the study were centralized and expressed in tables and graphs in the results section of the paper.

Female sex compliance for dental treatments, as well as their interest in aesthetics, is also evidenced by the higher number of female patients who presented themselves to the dental office in the prescribed period compared to males.

As regards of the comparison between female and male groups, the results showed that there were significant differences in the female-group size of the dental mesio-distal dimension, implicit also of the anterior Bolton ration, compared to the male group. These results are consistent with literature studies conducted on 228 subjects by Uysal T, Basciftci FA, Goyenc Y. [7, 8], or by 56 subjects by Lombardo L. [9,10].

For male patients, mean sextant values were significantly higher than in females, as confirmed by a Smith SS study on 180 patients. [11]

As a result of the data obtained, there was a greater variability of the mesio-distal size of the mandibular teeth than the maxillary teeth, which contradicts some literature studies. [12]

Analyzing the data obtained from W. Bolton's formula, different classes of malocclusion resulted, each representing differences in the Bolton value calculated from that considered norm. [7] [13-17]

As a result of the statistical tests performed, no difference was observed between the patient's sex and the type of excess, the same result emerging from some studies present in the literature. [18]

With respect to the gold proportion, of the 70 patients, only 13 patients were close to the golden ratio.

**Conclusions**

- There is no statistically significant dependence relationship between the patient type and the type of excess
- The values of the patients in the study group that had mandibular excess were significantly higher than the maxillary values. And prevalence was higher in the female population.
- According to the results presented, there is a slight discrepancy of the obtained values compared to the ones presented in the literature, such as: in maxillary canines, incisors and mandibular canines, a diameter 0.1-0.3 mm larger, and in the mandibular incisor, with 0.15 mm which would modify the Bolton Ratio in Romanian Population
- In the case of values 1.1, 1.2, 1.3, 2.1, 2.3, 3.2, 3.3 and 4.2, as well as the value of maxilary or mandibular excesses, the female sex in the examined patients group had significantly higher values than the male.
- The choice of therapeutical approach is theoretically dependent on the location of the excess although orthodontists would prefer to make the decision together with the dentist whom reffered the patient

Bolton's original data does not represent all populations, interarch tooth size relationships are population and gender specific and population-specific standards are necessary for clinical assessments.

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# EARLY-ONSET NEONATAL SEIZURES – CLINICAL AND ETIOLOGICAL CONSIDERATIONS

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**Abstract**

Seizures are more common in the neonatal period than in any other time of life, most of them occurring in the first week of life. Neonatal seizures frequently present just with subtle signs, or are entirely nonconvulsive, with no clinical manifestation and may be only detectable by electroencephalography (EEG), especially in ELBW preterm, due to neurological immaturity. Common causes of neonatal seizures include hypoxic ischaemic encephalopathy, intracranial haemorrhage, intracranial infections, congenital cerebral malformations, metabolic disorders, and focal ischaemic stroke. Neonatal hypoxic-ischemic encephalopathy (HIE) is a leading cause of long-term neurological morbidity and important cause of mortality.

**Keywords:** neonatal seizures, hypoxic-ischemic encephalopathy, neonatal encephalopathy.

**Introduction**

In early neonatal pathology, seizures often occurs isolated or associated with other neurological, metabolic or infectious diseases.

The so-called organic seizures, occurring on the substrate of a neuropathological lesion, are slow-evolution forms with imaging and electrical (EEG) changes, with different clinical expression depending on the degree of neurological maturity.

Perinatal hypoxic-ischemic encephalopathy is a common cause, all five neuropathological patterns being present: isolated and diffuse hypoxic lesions, periventricular leucomalacia, basal ganglion necrosis, selective neuronal lesions, parasagittal cerebral injury.

The role of APGAR score in appreciation and correlation with disease evolution is very discussed, as there are other pathologies with low APGAR score at birth: amniotic fluid aspiration, maternal infections, anesthetics administered to the mother, prematurity.

*Neonatal seizures- clinical and etiological aspects*

A seizure is defined clinically as a paroxysmal alteration in neurological function (behavioral, motor, or autonomic function). This definition includes paroxysmal alterations that are definitely epileptic, electro-clinical seizures, as well as clinical-only seizures. Electro-clinical seizures refers to their temporal association with EEG seizure activity, while paroxysmal clinical phenomena that are not consistently time-locked with EEG seizure patterns, define clinical-only seizures (1).

Clinical diagnosis of seizures is a major issue. There is a high incidence of EEG-only seizures in neonates (non-convulsive, subclinical, occult seizures). Numerous studies have indicated that about 80% of EEG seizures in neonates have no associated clinical symptoms, and therefore would not be identified without continuous EEG monitoring even by expert clinicians. Also, there are no differences in the degree of encephalopathy and the electroclinical seizures or EEG-only seizures (1,2).

It is very important to determine the etiology of neonatal seizures because of the significant impact on prognosis and outcome and influences further therapeutic strategies (3-5). The three most common etiologies of neonatal seizures are hypoxic-ischemic encephalopathy, ischemic stroke and intracranial hemorrhage (6). They are also a common manifestation of infection (meningitis, encephalitis), acut metabolic disorder (hypocalcemia, hypoglycemia, hypomagnesemia, hyponatremia, hypernatremia) or inborn errors of metabolism (galactosemia, hyperglycinemia, urea cycle disorders).

Clinical manifestations are variables. Focal seizures consist of twitching of muscle groups, particulary those of the extremities and face. Many muscle groups simultaneously are involved in multifocal clonic seizures. Tonic seizures are characterized by rigid posturing of the extremities and trunk and are sometimes associated with fixed deviation of the eyes. Myoclonic seizures are brief focal or generalized jerks of the extremities or body (7). One particular type of neonatal seizures are so-called "subtle seizures", which are clinically manifested as chewing, pedaling or bicycling movements, ocular movements as blinking or nistagmus, apnea or excessive salivation.

Neonatal seizures are mostly focal. Generalized seizures have been described in rare instances, and their clinical presentation is highly variable.

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Clinical seizures like focal seizures (clonic or tonic) and some myoclonic seizures have corresponding discharge on EEG, are clearly epileptic and are likely to respond to anticonvulsivant treatment. On the other side, generalized tonic seizures, subtle seizures and some myoclonic seizures, do not have activity recorded on the EEG. These infants tend to be neurologically depressed or comatose as a result of hypoxic-ischemic encephalopathy and may not require or respond to antiepileptics (8).

We can also meet electrical seizures, with markedly abnormal background EEG, without clinical seizures, in comatose infants who are not on anticonvulsivants. Conversely, electrical seizures may persist in patients with focal seizures after the introduction of anticonvulsivant treatment, without clinical signs (8).

The longterm EEG recording is the method commonly used to detect the presence of electrographic seizures. In the neonatal intensive care unit (NICU) amplitude integrated EEG (aEEG) technology is increasingly used for continuous monitoring of brain function. It is used independently or in conjunction with conventional EEG recording in NICU. Only clinical observation alone can under-diagnosis neonatal seizures, but also suspected episodes may not show corresponding electrographic evidence of seizures. Conventional EEG and aEEG are the two main methods used for detection and monitoring of the newborn infants (9).

*Neonatal hypoxic-ischemic encephalopathy*

Hypoxic-ischaemic brain injury remains a significant problem in our days, both in term and near-term infant.

Neonatal hypoxic-ischemic encephalopathy (HIE) is a leading cause of long-term neurological morbidity and important cause of mortality. The consequences are devastating as survivors present various neurodevelopmental problems, with financial, emotional and physical implications both for victims and their families.

According to Volpe (3), hypoxemia may be defined as the "diminished amount of oxygen in the blood supply", and cerebral ischemia is defined as the "diminished amount of blood perfusing the brain". The more important of the two forms of oxygen deprivation seems to be cerebral ischemia because it also leads to glucose deprivation.

The term HIE is often incorrectly used synonymously with neonatal encephalopathy (NE). NE is a clinical defined syndrome of disturbed neurological function in the earliest days of life in the full-term infant, manifested by difficulty with initiating and maintaining respiration, depression of tone and reflexes, subnormal level of consciousness and often seizures (7). Conditions causing neonatal depression and neonatal encephalopathy can mimic intrapartum asphyxia: congenital infections, neonatal sepsis, congenital myotonic disorders (myasthenia gravis, Prader–Willi syndrome, peroxisomal disorders), metabolic conditions (maple syrup urine disease), lung or airway disorders (pneumothorax, congenital diaphragmatic hernia), extracranial trauma causing significant blood loss and low blood pressure, genetic disorders associated with thrombotic or thrombophilic abnormalities (factor V Leiden deficiency, protein C and protein S deficiencies, anticardiolipin antibodies) (10).

If there is evidence that intrapartum asphyxia is the cause of the neonatal encephalopathy, the disorder is termed hypoxic–ischaemic encephalopathy (HIE).

Neonatal complications of intrapartum asphyxia include multiorgan failure and neonatal encephalopathy. Hypoxic-ischemic encephalopathy is the most studied clinical condition, producing the most serious sequelae.

Four essential criteria are necessary before acute intrapartum hypoxia insult can be considered to be the cause of a moderate to severe neonatal encephalopathy, that subsequently results in cerebral palsy (11):

1. Evidence of a metabolic acidosis in intrapartum fetal umbilical arterial cord or very early neonatal arterial blood samples (pH <7.00 and base deficit >/= 12 mmol/L);
2. Early onset of severe or moderate neonatal encephalopathy in infants born at 34 or more weeks of gestation;
3. Cerebral palsy of the spastic quadriplegic or dyskinetic type;
4. Exclusion of other etiologies (trauma, coagulation disorders, infectious conditions, genetic disorders).

Additional criteria, that together suggest an intrapartum timing but by themselves are not specific:

1. A sentinel hypoxic event occurring immediately before or during labour (prolapsed umbilical cord, uterine rupture, placental abruption, acute maternal haemorrhage, maternal anaphylaxis, acute neonatal haemorrhage);
2. Sudden, rapid and sustained deterioration of the fetal heart rate;
3. Apgar scores of 0-6 for longer than 5 minutes;
4. Early evidence of multisystem involvement (within 72 h of life);
5. Early imaging evidence of acute cerebral abnormality.

Sartan and Sartan developed the three-level grading system of mild, moderate and severe encephalopathy widely used, based on clinical symptoms and EEG (12,13).

Infants with the mildest degree of encephalopathy (stage 1) have transient irritability, hypertonia and poor feeding that usually lasts less than 24–48 hours. It is associated with a good neurological outcome.

Newborn infants with moderate encephalopathy (stage 2) show lethargy, hypotonia, hyporeflexia and seizures. The EEG typically shows reduced background activity associated with a lowering of the lower baseline on the amplitude integrated EEG with seizures. Seizures typically occur in moderate encephalopathy, with a poor outcome in 15–40% of the cases (10).

Stage 3 encephalopathy (severe) is characterized by profound stupor or coma and the EEG is usually isoelectric, suppressed or burst suppression. Infants are flaccid and unresponsive to any stimuli, often associate bradycardia, hypotension and apneea. Seizures are common and they are often refractory to anticonvulsants. The mortality rate is high and nearly all survivors develop sequelae.

**Discussions**

A study regarding prediction of neonatal seizures in HIE concluded that EEG variables performed better than clinical variables such as low Apgar scores and low cord pH, in encephalopathic neonates undergoing therapeutic hypothermia (14). HIE-seizures in neonates accompany high seizure burdens with frequent status epilepticus and electrographic seizures (15).

Among infants diagnosed with hypoxic-ischemic encephalopathy, the mortality and morbidity often attributed to neonatal seizures can be better explained by the underlying severity of encephalopathy. This are the conclusions of a study using the data collected from 208 infants diagnosed with hypoxic-ischemic encephalopathy, who were enrolled in an National Institute of Child Health and Human Development (NICHD) trial of hypothermia (16). It can be said that seizures are a symptom of underlying encephalopathy, and there is no evidence to suggest that seizures themselves cause long-term adverse neurological outcomes (17).

In a study of 426 neonates, Hannah C. Glass, Renée A. Shellhaas and colab. concluded that the most common seizure etiologies were hypoxic-ischemic encephalopathy (38%), ischemic stroke (18%), and intracranial hemorrhage (11%) (6).

HIE-seizures in neonates are known for their resistance to first-line antiepileptic drugs (AEDs) like Phenobarbital (18). The alternative treatment options for refractory seizures, such as levetiracetam and midazolam, have shown variable effects (18-20). Treating seizures may improve long-term neurodevelopmental outcomes, as clinical seizures in neonates with HIE are associated with worse neurodevelopmental outcomes, independent of the severity of HIE (21).

For treating neonates with HIE, therapeutic hypothermia has become a standard practice, based on the evidence from pre-clinical and clinical studies that documented reduced brain injury in HIE-neonates (22,23). Clinical studies have documented that therapeutic hypothermia significantly reduced mortality and short-term morbidity, and improved antiepileptic drugs efficacy in neonates with HIE (23–25).

**Conclusions**

The immature brain has a higher seizure susceptibility due to multiple developmentally regulated features (18,26).

80–85% of neonatal seizures are predominantly caused by hypoxic–ischemic encephalopathy (HIE), intraventricular hemorrhage, metabolic disturbances, and infections (18).

Clinical detection of neonatal seizures is difficult because not all the infants have clinical manifestations of seizures and the detection of them represents a particular diagnostic challenge in the neonatal intensive care unit (27,28).

Early diagnosis and appropriate treatment can reduce the long-term complications and sequelae.

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# THE ROLE OF NUTRITIONAL EDUCATION IN PRESCHOOLERS

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**Abstract**

Nutritional education plays a vital role in bringing about a greater awareness of the value nutrition has in adopting a healthy lifestyle. Broadly speaking, education is transformative, providing knowledge through instruction that first acts upon the attitudes of a person and then goes on influencing their behavior. The earlier this process begins, the more effective it is. That is why the provision of training as early as the pre-school years can be viewed as a future investment, considering that healthy eating habits are formed at early ages. Nutritional education must be continuous, effective and address all family members, caregivers and educators. The aim of nutritional education, therefore, is to instruct children on how to adopt an adequate and balanced diet, create a positive attitude about the food, encouraging the acceptance of various foods, eliminate unhealthy eating habits, use food resources economically by improving nutritional conditions and preserve the well-being of the body. By providing children with nutritional education during the preschool period, their future eating habits can be shaped in a healthy manner.

**Keywords:** education, nutrition, preschoolers.

**Introduction**

The first six years of a child's life represent a period of quick physical, emotional and mental development. During these formative years, children also interact with the social environment at the most intensive level [1]. As an individual who develops within a family, a child achieves eating habits during this period of development and change that are directly or indirectly affected by the eating habits of the family; that is, the mother, father, brothers or sisters or caregiver [2,3]. The family has a decisive influence on auto-control of food intake and creation of appropriate dietary habits or not [4]. The preschool years are a great time to help children develop positive attitudes towards food and good eating habits. Teaching children to make healthy choices in the food they choose is certainly a worthwhile goal and one that will affect their lives through adulthood [1].

Furthermore, during the preschool period, inadequate and unbalanced nutrition negatively impacts the physical and mental development and learning ability of a child. This negative impact on children results in learning disabilities and failure in the period of preschool education. A healthy diet is essential for children to ensure that they undergo normal growth and development and to prevent a variety of nutrition-related health problems, such as anemia, growth retardation, malnutrition, compromised cognitive achievement, obesity, dental problems, and chronic diseases later in life [5, 6].

As insufficient information about nutrition leads to many dietary-related health problems, it is necessary that persons of all ages be provided nutrition education to mitigate these risks. In addition to the family, schools and kindergartens should also be tasked with the responsibility of educating children on nutrition in order to create awareness about this issue. This will help children to not only improve their physical health but to also raise their levels of achievement at school.

For children, healthy eating is learned by actively observing and doing. In providing positive food experiences, early childhood programs help children to develop an awareness of good nutrition and to develop healthy eating habits for a lifetime [7]. It is of critical importance that nutrition education be given at early ages, particularly in the preschool period, to ensure that a healthy lifestyle is maintained. It has been well-established that nutrition education programs have a positive impact on nutritional knowledge and eating habits [8].

**The role of nutritional education in the development of preschoolers food behavior**

The preschool period is also the time when they begin to understand that nutrition plays a major role in their lives. Nutritional education during the first years of life, especially during pre-school, is important for lifelong health, but it is also difficult to achieve. Preschoolers do not always understand what they are explaining about nutrients and the nutrient-food relationship. They may not understand the effect of food on the body [9].

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The information they receive must be simple, easy to understand and memorized, such as the need to have breakfast, drinking enough water, the consumption of a variety of different color foods at each meal, the size of the servings, examples of how to measure the servings correctly [10]. Also, the information must be age appropriate and delivered in an attractive manner.

25-50% of young children have food problems, especially when exposed to new foods. These problems are a cause of stress for parents and, over time, they can even affect the relationship between parent and child - an essential component of eating behavior [11].

The management of eating disorders include:

-setting up a 3-main meals and 2 snacks plan;

-providing the second course at the main meals after the first one was finished;

-serving the meal together in a calm atmosphere and appreciating the child if he ate well;

-positive feedback about food;

-having the meal together with other preschoolers;

-inclusion of the preschool in the process of food procurement and food preparation [12].

Some authors recommend using fruit and vegetable games and drawing fruit and vegetables as useful for increasing the consumption of new foods [13]. Heath et al. quoted by Nicklaus and Monnery [14] noted that preschoolers whose parents read them books with fruits and vegetables pictures are more willing to test them, although they did not initially accept or considered them unfamiliar.

It has been noticed that preschoolers are more vulnerable to messages that lead to the development of unhealthy food preferences, such as commercials on television. This also explains the link between exposure to television and media and childhood obesity [11]. Accessibility to particular foods as well as exposure to media influence eating behaviour and food choices [11]. Watching TV programs can affect the ability of parents and the child to monitor food intake, and is associated with increased intake of unhealthy food [15, 16].

Therefore, some EU Member States have implemented regulations to reduce exposure to advertising for food and drink, to restrict their marketing not only on TV and in stores but also on the Internet (EU Action Plan 2014-2020).

Family environment influences the diet at this age. Satter quoted by Eneli and col. [17] describes the ideal food environment as the "environment in which parents decide what foods are offered, where and when they are consumed and where children decide what to eat and how much to eat".

Child's food choices depend on what they see and what is more accessible to them. Thus, limiting the access to less healthy foods may improve health and prevent disease. Parents mustbe a model for the child in accordance with the principle of "eat what I eat" and not "eat what I say" (2). Often parents are not informed, they do not have the necessary knowledge or are not aware of their role in the promotion of healthy dietary behaviour. Lack of knowledge regarding healthy eating leads to the purchase of poor nutrients food, the lack of cooking skills, sensitivity to food commercials that produce imbalances in diet [18].

Broadly speaking, the mother is the one that make the choices about the child nutrition [12,3]. Responsible mothers are a protection factor against eating disorders. The ones that have regular meals with nutritionally balanced food will extend this kind of behaviour to the child as well (4,17). The increased consumption of fruits and vegetables by the mother and the lower pressure on the child is associated with a small number of picky eating children (19). Jahnke et al. investigated the behavior of 142 children aged 3-6 years and their mothers by having a questionnaire filled in by mothers. Statistical analysis revealed gender differences in the transmission of eating behavior in favor of boys (20). The father has influence over the child diet and physical activity also, therefore he must be an active participant in developing the eating behaviour of the child.

The relationship between the child and parents/caregivers is the essential component of infant and preschool food behavior [11].

There are 4 types of parents in terms of to responsibility and control:

a. authoritatively firm, but close and accepting

b. authoritatively – strictly disciplinary

c. indulgent (permissive)

d. careless [12].

Another classification divides the eating behaviour of the parents in 2 types:

-open (exercising control that can be detected by the child; example: firmness about the consumed food);

-closed or hidden (it is not detected by the child; example: not bringing to the house unhealthy foods) [19].

The eating attitude of the parents can be positive (eating together with the child, the same food that the child should eat, pleasant interaction with the child during meals, adequate portions) or negative (forcing the child to eat healthy foods and to eat more when they think is not enough, giving prizes to encourage the child to eat more food or more kind of foods, encouraging to eat all the food in the plate) [19,12].

Pressing the child both positively or negatively can negatively impact food preferences, and restrictions may increase preferences and contribution to restricted foods. Rewards under the form of food can lower the preference for the food in question and may increase the preference for foods offered as a reward, for example sweets. According to the study conducted by Orrell-Valente quoted by DeCosta and col., 85% of parents used different strategies to encourage their children to eat more food (pressure to eat more, reward, punishment, restriction of access to some foods or favorites or to all foods), which can have both positive and negative consequences [19].

Parents who allow their child to set the meal time and the ingested quantity contribute to development of food intake self-regulation, while parents who allow their child to explore the surroundings help them develop their social and motor skills [11].

Parents also have to involve the preschooler in purchasing the groceries, in selecting healthy foods and

preparing them [21]. The implication of the child in the process of cooking the meal may increase the desire to try new things, reduces neophobia and is associated with a better quality of the diet and a reduced number of picky eating children [19,22].

The preschooler must not be forced to finish all the food in his plate, nor to be criticized during the meal or in front of other children. Forcing the child to eat more than he can (the empty plate syndrome) may prevent the child from learning how to self-regulate the food intake, affects food choices and can lead to overweight/obesity or can determine the child to eat less than he needs [16,23]. Allowing the child to choose what and when to eat, the parents become more responsible to the child needs [16].

**The nutritionist – the main factor in preschooler care team**

The nutritional education in preschool is a continuous process, a transformative one and with a continuously changing form because of the targeted public. Therefore, in a preventive medicine era, the nutritionist must provide up-to-date, accurate information and send clear messages about diet along with the need of physical activity and intervene when the eating problems occur.

It has been noticed that community-based interventions on children, parents and educators significantly increase the consumption of vegetables and low-fat milk at pre-school age [24]. Because at preschool age the child needs to ingest adequate servings, the nutritionist needs to teach the parents/caregivers, and afterwards the children, what is the correct size of the servings, and how to make changes in diet through evaluation of the size of daily servings of each food group [13].

The preschool age is defined by the manifestation of independence during meals [25], therefore the parents may encounter difficulties during the transition from toddler to preschooler and their tendency to independence can be a barrier to collaboration [26].

The nutritionist should teach parents to encourage the acceptance of a new food that should initially be given along with a favorite food, then separately. Eating together with the child helps them try new foods and communicate the feeling of hunger or satiety [11]. The acceptance of a new food requires 8 to 10 attempts. Growing up, it has been noticed that repeated exposure to new foods increases the rate of acceptance only if the food is tasted, the visual exposure is not enough at age 2-5 years [14]. If the parents give up after 5-6 attempts and conclude that the child dislikes that food is an error that can lead to unnecessary food restriction. De Sousa Maranhao and col. have studied the prevalence of eating disorder at 301 preschool children from kindergartens of north-east of Brazil through a questionnaire filled in by the mothers. Of them, 37.20% had food disorders from which 25.40% had a selective food intake and they concluded that the mother, as well as the mother-child relationship, have an important role in preventing such disorders [4].

Neophobia (the fear of accepting a new food) can be genetically determined, can be related to parental neophobia, or may be related to the child's sensory hypersensitivity. Most often, neophobia is associated with lower consumption of fruit and vegetables. Thus, it can be associated with constipation, probably due to the low fiber content of the diet. It has been noticed that those children that were breastfed and who received increased amounts of vegetables at the time of diversification, eat more vegetables at the age of 6 years. At the same time, the presence of neophobia at 4 years predicts the desire/acceptance of all foods. If preschoolers of 3-5 years offer food they do not like to colleagues who accept that food, then their preference for that food may also increase [27]. As an expression of neophobic behaviour, fruits and vegetables are the most frequent refused foods [13,23]. The neophobia can be prevented by repeatedly offering a wide variety of foods, parents having the meals together with the child, without pressing the child to eat the new food, offering food that is easy to eat (using the hand), rewarding the child with attention, not sweets and sweet beverages [12].

Likewise, the nutritionist needs to teach the parents to read the labels for finding the nutritional content of the food that help them to make healthy decisions. Beside the quantity of macro- and micronutrients/100g as much as important is the content of additives or sweeteners that have numerous side effects.

Another task that must be fulfilled is that the nutritionist needs to provide information and offer guidance regarding cooking methods. It has been noticed that home cooked meals offer a better intake of nutrients [16]. The recommendations are to use a variety of cooking methods: boiling, cooking in the oven, steaming and only once/week frying and adherence to food hygiene rules in preparing meals.

An important issue that the nutritionist must cover during the nutrition education sessions is the risk of aspiring food in the airways. This risk is present at all ages, but it is higher for the small child. The parents must be informed about the appropriate age for children to eat solid foods and the risk can be minimized by careful supervision of the child by parents/educators during the meal, serving the table in a sitting position, not running around the table or play while eating, eating small pieces of the food that may be aspired (grapes, watermelon, apple, celery, carrot, popcorn, cherry, parsley, sausage), avoiding chewy foods (plums, peaches, nectarines) or fibrous foods (celery, raw pineapple) or peeling/removing fibrous parts [12,16]. Also, the possibility of food allergies (nuts, strawberries, kiwi, egg, cow's milk, gluten, sesame, etc.) of the preschool child is another fact that the nutritionist should discuss with parents [16].

The role of the nutritionist is also to prevent the occurrence of eating disorders that are common in the child and may have multiple causes (physical abnormalities, neurological diseases, metabolic diseases, appetite suppression disorders, picky eating, etc.) [28]. The picky eating (selectively) behavior can be determined by factors

such as parental pressure to eat, child's personality, different parenting practices, eating habits, social influences, diversification under 6 months, late introduction of foods to be chewed. There is no single accepted definition of picky eating. It is considered "the consumption of an inappropriate variety of food through the refusal of an increased number of familiar and unfamiliar foods" or "restrictive food intake, especially of vegetal and high preferences (including specific methods of preparation) that cause parents to give a different kind of food to the child than other family members "or" eating a small amount of food in the diet, refusing to try new foods, limited supply of vegetables, special food preparation "[29,30,31,32]. It has been observed that these children have a higher caloric intake or eat more dense energy foods, which leads to a decrease in the consumption of other foods (fruits, vegetables, whole grains) and to the disruption of the diet.

Nuria de la Osa and col., studied food problems through a questionnaire, (food refusal, food selection, neophobia, fussy eating, picky eating, low appetite, low interest in food) in 622 children aged 3- 5 years and the association between eating behavior and parental habits. The authors concluded that the diet and behavior of preschoolers should be one of the main concerns of parents and health care providers, as more than half of children experience such a disorder [33]. The nutritionist may encounter difficulties in communication with parents because they are either too busy and do not find time to talk, either consider the discussion with the child to be priority or are not receptive to nutrition education materials. However, the relationship between the parents and nutritionist must be based on mutual respect with positive communication, conflict avoidance in order to ensure child health [34].

There is an increased number of preschool age children with dental caries, therefore the cariogenic foods must be known by parents: high-grain cereal food products (pretzels, chips, crackers) causes the oral pH to drop below 5.5, desserts, candies, sweet drinks of fruit or not, ice-tea, soda, sugar, honey, corn syrup. Cariostatic or anti-cariogenic foods do not cause a decrease in salivary pH below 5.5: food proteins from eggs, fish, meat, beans, soybeans, peas, nuts, peanuts; fats, sugar-free chewing gum; fresh vegetables; dairy products [35].

Beside the time spent at home, the preschoolers spend time separately from the family at kindergarten and it is therefore important that the food received to be nutritionally appropriate because the meals served in the community can make a significant contribution to the development of healthy eating behavior [36]. Various studies mentioned in Sisson's work [37] revealed that preschoolers consume more fruit and vegetables and dairy products with moderate fat content at lunch at the kindergarten than they consume at home-served dinner.

At kindergarten the educators are responsible to make healthy food choices for the children, but Osman Galal, The General Secretary of the United States International Nutrition Union [38], noted that many of the teachers did not know the link between nutrition and cognitive function. Given that 81% of pre-school children in developed countries attend kindergarten and spend a lot of time in collectivity, it is important for the nutritionist to improve both the educators' knowledge and the quality of the meals served in the kindergarten by limiting access to less healthy food [39]. If the child spends about 8 hours in kindergarten, he has to consume 1/2 of his daily needs in kindergarten. The difference should be consumed at breakfast and dinner. If he spends 4-7 hours a day in kindergarten, the preschool must consume 1/3 of the recommended daily ration (RDR). Usually in kindergartens, snacks do not contain fruits and vegetables, which can lead to a reduction in their daily number of meals containing fruits and vegetables [40].

Attending kindergarten influences the eating habits, and the influence of friends, colleagues, the media and marketing become greater [16,19]. Food marketing is a major factor influencing the child's diet by using different ways of transmitting messages (cartoons, toys, etc.). Exposure to unhealthy food during TV commercials will be associated with increasing preferences for advertised foods [25].

In 2015, under the coordination of WHO, the European Network for Reducing the Marketing Pressure on Children was established. The purpose of this network is to develop public health policies that restrict marketing to 17 categories of foods that should not be advertised among children. In Romania, in 2017-2018, the National Health Assessment and Health Education Program aims to improve health by promoting a healthy lifestyle and combating the main risk factors [41].

**Nutritional education programs for preschool in Romania and their outcomes**

1.“Traista cu sănătate” (Health-filled Bag)

The "Traista cu sănătate" program was launched in Iaşi in 2012. It is an educational program dedicated to children and their families, and itpromotes a healthy lifestyle while respecting local traditions. It is based on scientific evidence and it is coordinated by experts from the "Grigore T. Popa" University of Medicine and Pharmacy of Iasi. It is recognized internationally, being included in the largest organization for the fight against pediatric obesity, EPODE International Network (EIN), along with programs from over 25 countries [42].

In this program, children learn about the elements of a healthy lifestyle, helped by a bag (The Bag of Health). Together with characters from fairy tales, children discover healthy eating. The educational materials are handbooks, worksheets, teaching boards, games and movies.

2.“Sănătos de mic” (Healthy since early age)

“Sănătos de mic” is a nutrition education program in kindergartens that includes training nutrition educators to teach this knowledge to preschools, parents and kindergarten staff, through healthy nutrition courses and workshops.

The results of the pilot project in 2017 were:

-elaboration of the preschool nutrition manual by the SAMAS Association in collaboration with the

representatives of all specialized institutions, as well as the manual of psycho-pedagogy.

- specialization of 12 medical staff (dieticians, kindergarten nurses, SAMAS perinatal educators) in the pre-school nutrition with a component of psycho-pedagogy.

- conducting the pilot project in 3 kindergartens in Bucharest by courses and workshops with teachers and kindergarten staff, cooking workshops and other teaching methods suitable for children, theater plays on nutrition for children in every kindergarten.

- analyzing the menu from kindergartens;

- completion by the parents of the questionnaire "Children's food habits"

- developing the Parents Guide for Pre-school Nutrition [43].

**Conclusions**

The personality of a child is largely shaped during the preschool period, and the behavioral habits that are formed during this period will go on to impact adult behavior. Therefore, the eating habits that a child acquires during the preschool period will be brought to bear on their future stages of life and, given that they have adopted healthy habits, be effective in preventing various nutritional problems in the future.

Good nutrition and healthy eating habits build a healthy foundation for children.

Nutritional education should be provided at every stage of the formal and informal education, to all people that are in contact with the child, including family, caregiver, educators, kindergarten staff.

**Conflict of interests**

The authors report no conflicts of interest.

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# ASYMPTOMATIC LARGE MESENTERIC LYMPHANGIOMA CYST

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**Abstract**

A mesenteric cyst is a cystic mass that appear on the gastrointestinal tract in the mesentery. It is a rare condition and was described for the first time in 1507. Most patients presents with a mass that occur progressively in the middle abdomen and mild abdominal pain. Many of this conditions are misdiagnosed preoperatively, like ovarian cyst, appendicitis, diverticulitis or alimentary tract duplication cysts due to lack of specific symptomatology. Whenever a cystic mass in the abdominal cavity is present, especially asymptomatic, a mesenteric cyst must be considered as well. We report a case of a child that presented in our clinic for mild abdominal distention without any other symptoms. Ultrasound and CT scan revealed a large abdominal cystic tumor occupying most of hypogastric space. It was misdiagnosed preoperatively as a possible ovarian cyst. Anyhow this patient was operated by robotic assisted surgery and definitive diagnostic was made – a mesenteric cystic lymphangioma.

**Keywords:** robotic surgery, lymphangioma, mesenteric cyst.

## Introduction

Mesenteric cyst, was first described in 1507 by Antonio Benivieni on an 8 year old girl, during the autopsy. (1-11). Most of mesenteric cyst appear in small bowel mesentery. Lympahngioma cyst appear because lymphatic channels in the mesentery are obstructed. (12, 13) They are benign tumors. Most of them are asymptomatic, but abdominal pain and palpable mass in the middle abdomen are signs for this pathology. Other symptoms include constipation or loss of appetite. (14) A histologic examination confirm the cyst. Most of this tumors can be operated by laparoscopic or robotic-assisted surgery. The differential diagnosis is made with ovarian cyst, appendicitis, diverticulitis, gastrointestinal duplication cyst, enteric cyst, mesothelial cyst, cyst spindle cell tumors and cystic teratomas. (15)

## Case report

An 8 year old female child presented in ambulatory with history of mild abdominal distension, without any another symptoms. At the psychical examination we only notice mild distention of hypogastric region. Ultrasonography revealed a flaccid mass filled with fluid in the lower abdomen. Blood tests was normal.

CT scan shows an oval fluid-filled mass in umbilical region, hypogastrium and right lower quadrant of 11,98 cm x 10,95 cm x 5,94 cm and set on the bladder dome (Figure 1).

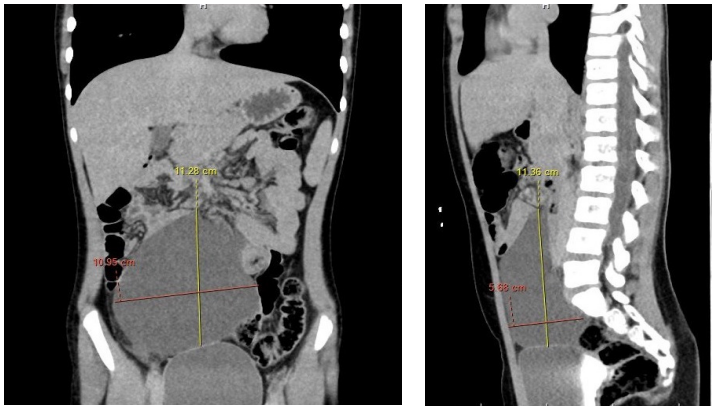


Figure.1 Computer tomography image of the cyst in sagittal and longitudinal section shows a fluid mass.

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After examination the patient was suspected for ovarian cyst. Was performed a robotic assisted surgical operation and was observed that the intra-abdominal mass does not communicate with ovary but originates in the mesentery of the first jejunal loop. The mass was punctured and a milky white fluid was evacuated as can be seen in the picture (Figure 2). The biochemical exam found lipase under the limit and triglycerides over the limit. The cyst was excized and send for histologically examination. The result of histologically exam was: cystic wall made of fibrous connective tissue and muscular fibers; vascular structure with fine wall, dilated and covered by broken epithelium inside the wall (Figure 3)

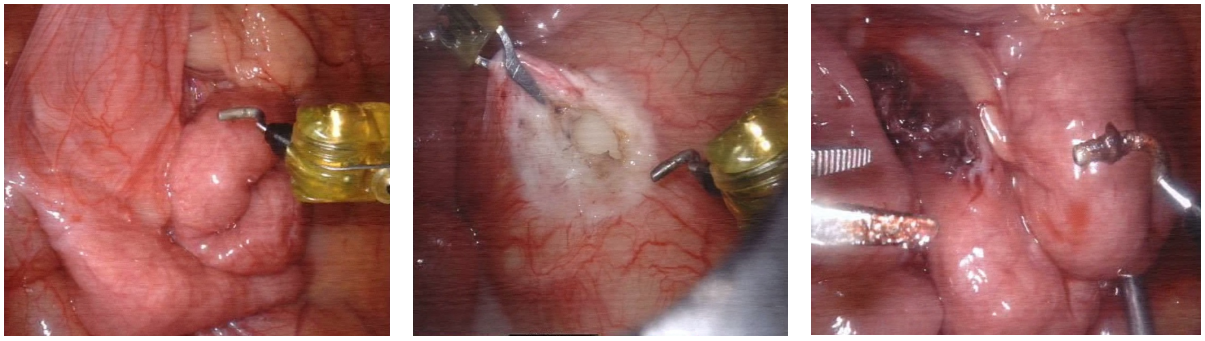

Figure 2. Intraoperative view of the cyst, from left to right: origin of the cyst at the first jejunal loop mesentery; after opening the cyst, the content is a milky fluid which at examination was lymph and last, the view after excision.

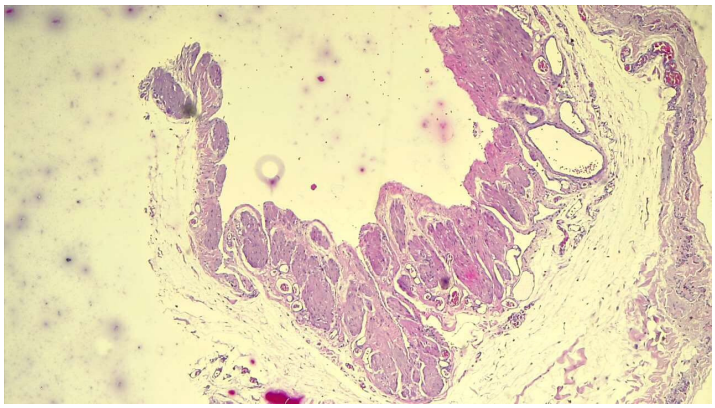

Figure 3. Hematoxylin-eosin histologic examination of the cyst.

**Discussions**

Abdominal cystic lymphangiomas are a rare pathology, with an incidence of 1 in 20.000-250.000. (1) Obstruction of the lymphatic ducts between the lymphatic system of the small bowel and the main lymphatic vessels lead to formation of a lymphatic cyst. Irregular wall tapped by endothelium that has muscle, foam cells and lymphatic tissue are described. (2)

The abdominal lymhpangioma is most of the time asymptomatic. Patient come to the doctor for abdominal pain or another digestive signs, like vomiting, diarrhea and constipation, many of these unrelated to the lymphangioma. At clinical examination can be noted a mobile mass, soft and painless in 58% of cases. (3,4). Our patient come to the hospital for middle abdominal distension, without any another signs. At psychical examination the cyst could not be palpated due to its flaccid consistency.

Alimentary tract duplication cysts, neuro-enteric cysts, mesothelial cysts, spindle cell tumors and cystic teratomas are the differential diagnosis of lymphangiomas cyst. (5) In this case the patient was misdiagnosed preoperatively as an ovarian cyst due to the fact that the cyst was large, flaccid and prolabated in the hypogastrium. Clear diagnosis preoperatively is hard to establish in this pathology because the mesenteric cyst does not have specific signs or symptoms.

CT scan and ultrasonography are sensitive, but it is not enough to make a preoperative diagnosis. (6) In this case the ultrasonography and computer tomography concluded to a possible ovarian cyst, that was invalidated at

the time of operation. Anyhow, imagistic investigations are very useful to judge if the cyst is broken or intact.

Treatment of the mesenteric cysts is excision, which require bowel resection in some cases. (7) J.E Losanoff and co-authors write in their article that the cyst must be excision because there is a risk of recurrence and malignant transformation, after radiotherapy for a primary lesion. This author classify mesenteric cyst in four classes. Type 1 is a pedunculated cyst, in second type is sessile, in third type is extended to retroperitoneum and in the last type is multi-cystic lesion. First and second types can be treated by complete excision, but second type can require sometimes bowel resection. In third type excision is often incomplete, and the last type may require sclerotherapy or more than one operation. (8) In our case the cyst was type 2 and was performed excision without bowel resection.

In an article, Durar R. et all described a technique named, spaghetti technique" that is useful to minimize blind zone in laparoscopy. The principle of this technique is to twist the cyst on the laparoscopic instrument. (9,10) In our case the use of robotic arms gave a very precise dissection view but this principle is a very good option for big cysts that cover most of laparoscopic view.

**Conclusions**

Lymphangioma cyst with abdominal localization is a pathology that has not specific signs. Pain and palpable mass can be the first signs. Because the middle abdominal distention was the only sign in our case, we conclude that is important to be investigated by ultrasound any abdominal distention. Misdiagnosis is a very often in abdominal lymphangioma cyst because there are few specific symptoms. Surgical excision is the best therapeutic treatment.

Excision of lymphangiomas is not an emergency, complete excision with or without intestinal resection is gold standard. Best approach is laparoscopic or robotic assisted laparoscopy, but with a higher cost.

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# CLINICAL-IMAGING STUDY OF CONGENITAL HYDRONEPHROSIS IN THE EARLY POSTNATAL PERIOD

**Nicoleta Lungu[1,2], Aniko Manea[1,2], Florina Doandes[1,2], Daniela Cioboată[1,2], Oana Costescu[1,2], Marioara Boia[1,2]**

**Abstract**

Early diagnosis of congenital hydronephrosis, sometimes even from intrauterine life, may lead to the establishment of a suitable therapeutic course to avoid the occurrence of complications.

Congenital hydroronephrosis, especially bilateral, and it is possible complications, such as recurrent urinary infections, which, in the absence of treatment, may impair renal function such as acute renal failure.

Good ultrasound monitoring of newborns at 24-48 and post-natal and at 3 months allows to improve the quality of life of these children before any possible complication.

In the present paper the authors propose to establish the presence of possible congenital hydronephrosis in a group of newborns admitted to the Neonatology Clinic of Louis Turcanu Hospital during the period 01.01.2016-31.12.2017 and the therapeutic conduct of choice that will lead to the avoidance of possible complications.

**Keywords:** congenital hydronephrosis, ultrasound, newborn, complications.

**Introduction**

Congenital hydronephrosis is a special clinical entity in neonatal pathology- representing dilation of the basin and renal calves by preventing urine flow to the bladder with possible consequences for urinary tract infections, renal dysfunction or insufficiency, lithiasis.

The continuing evolution of medicine and access to imaging investigations in pregnancy have allowed the diagnosis of hydronephrosis since the 18th week of gestation which has led to an improvement in the subsequent progression of newborns with congenital hydronephrosis. The antenatal association of the oligohydramnios is suggestive of a possible renal tract obstruction.[1].

Dispensing pregnancies and accessing fetal ultrasound will allow for prenatal diagnosis by measuring the anteroposterior diameter of the renal pelvis (5-10mm between 18-23 gestational weeks).[2].

Once diagnosed, Congenital Hironephrosis is a priority in determining the cause and establishing appropriate therapeutic behaviors, sometimes requiring surgery in some cases.

Good ultrasound monitoring of newborns at 24-48 and post-natal and at 3 months allows to improve the quality of life of these children before any possible complication.[4]

The major challenge is still to differentiate between clinically significant and transient hydronephrosis and to choose the optimal way to manage these cases.[3].

To know whether or not there is hydronephrosis, a pre or postnatal abdominal ultrasound is sufficient.

For the diagnosis of the cause of hydronephrosis, besides ultrasound, some of the following explorations may be needed:

- Urine and blood examinations
- Tomography computer exam
- Urography
- MRI
- Urinary scintigraphy
- Bladder Investigation (cystography)
- Bladder or ureters survey
- Laparoscopic exploration.

*Prenatal hydronephrosis*

Hydronephrosis - Dilation of the pelvis - is the most common prenatally identified genitourinary abnormality, with an incidence of 1 to 5% of all pregnancies.[1] Prenatal hydronephrosis is an ultrasonographic identification and not a diagnosis itself; in the vast majority of cases, antenatal hydronephrosis is a transitory condition with no clinical significance, and in other cases (12-88%) may be the expression of an associated pathology, generally speaking of upper or lower urinary tract obstruction, or of reflux; in these pathologies, prenatal ultrasound is useful, preventing complications such as urinary tract infections, dysfunction or renal insufficiency[2].

CLASSIFICATION OF HYDROPHENOSIS IN GRADES

Depending on the severity, hydronephrosis is classified in 4 degrees (1, 2, 3, 4) hydrology, which is the increasing order of severity of hydronephrosis (according to the Society of Fetal Urology).

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Degree of prenatal hydronephrosis depending on the anteroposterior diameter of the renal pelvis. Degree of Prenatal Hydronephrosis Second Trimester or Third Trimester [5].

-Light 4 to <7 mm -7 to <9 mm

-Moderated 7 to 10 mm 9 to 15 mm

-Severe> 10 mm> 15 mm

In 1993, the Fetal Urology Society (SFU) introduced a hydronephrosis grading system based on pelvis, calcite, renal parenchyma, a widely accepted system [4].

Small hydronephrosis is also called early hydronephrosis and spontaneously resolves postnatally in 80% of cases [5].

**Aim**

The authors proposed to analyze the incidence, progression and complications of hydronephrosis as well as the subsequent evolution of renal function.

**Material and method**

A retrospective study was carried out over a period of 2 years (1.01.2016-31.12.2017), analyzing the observation sheets from the Clinic of Neonatology - Premature of the Emergency Hospital for Children "Louis Ţurcanu" Timişoara, on a batch of 12 patients admitted with the diagnosis of congenital hydronephrosis.

The target population was newborns and hospitalized infants aged between zero and 3 months who were diagnosed with congenital hydronephrosis and where imaging investigations allowed confirmation of the diagnosis.

Determining the cause of congenital hydronephrosis born in the presence of maternal oligoamnios and associated factors (urinary infections during pregnancy).

**Results**

Congenital hydronephrosis was largely asymptomatic, being prenatally diagnosed in fetal morphology ultrasound - 75% of cases, and 25% were postnatally diagnosed, associating a symptom of urinary tract infection (41.66%).

Initially the batch of patients were investigated imagistically, abdominal ultrasound, which revealed in all cases hydronephrosis of a certain degree.

Cystography is the most important exploration in identifying the morphological and functional data characteristic of each defect in part, and in most cases allowing the correct diagnosis to be made, was carried out in all cases with suspicion of the posterior urethral valve or the pielocaliceal junction stenosis, was required in 6 out of 12 cases, representing 50% of patients admitted to the batch.

In the studied group all 12 were newborns were on term, and 1 case among them, was newborn on term with intrauterine growth restriction.

The gender distribution of the total number of newborns diagnosed with various types of hydronephrosis showed a slight predominance of male gender: 83.33% boys versus 16.66% girls.

Following the imaging investigations (Abdominal Ultrasound, Cystography) it was found that the posterior urethral valve represented 33.33% (4 cases), 50% (6 cases), followed by urinary tract infections 16.66 % (2 cases).

A 25% (3 cases) of hydronephroses associated with vesico-ureteral reflux and 41.66% of cases requiring surgery.

They were also diagnosed and infants with single congenital kidneys accounted for 8.33% (1 case) and 8.33% (1 case) syndrome which also associated congenital heart malformation.

The case associated with heart malformations died, accounting for 8.33% of the study group.

The rest of the cases required corrective surgery to avoid severe complications (acute renal failure, urinary tract infections) that would require prolonged hospitalization with increased human and material consumption.

**Discussion**

Early identification of cogent hydronephrosis since the antenatal period provides a significant benefit in establishing the subsequent therapeutic course and preventing its possible complications.

The identification of hydronephrosis involves repeated examinations during pregnancy and neonatal evaluation, the sooner the hydronephrosis is important, bilateral, renal mass, urinary tract infection or if there is suspicion of a single kidney [4].

We must keep in mind that many congenital anomalies can also involve kidney damage. That is why the phenotypic aspect with implanted lower ears, associated or not with sexual ambiguity, abdominal wall defects, anal atresia, skeletal abnormalities, myelomeningocele, spina bifida occulta, pneumothorax, pulmonary hypoplasia, hypospadias, cryptorchidism underlie the widening of the base of investigations in the sphere renal [5].

Hydronephrosis with all evolutive stages is commonly found in medical practice many times in the postnatal period, but the forms of disease, evolutive stages are established postnatally, in dynamics, both on clinical data but the most secure on imaging data.

If hydronephrosis is moderate or severe, postnatal assessment should take place immediately after birth but in the case of mild, antenatal hydronephrosis, expected for several days is recommended to allow good hydration and minimize the incidence of false negative results due to oliguria and dehydration specific to the first days of life. [3].

In interpreting an imaging bulletin, we must take into account the functional morpho-functionality of the kidney. In the newborn, the kidney has lobular surface, palpable lower pole, moderate dilatation of the pielo-caliceal system, kidney pyramids have well developed, more pronounced.

Postnatal kidneys replace placenta in the homeostasis of the body. This transition occurs progressively by increasing renal blood flow, glomerular filtration rate and tubular functions.[2]. Taking this into account, the renal

function is improved, which should be correlated with postnatal age and less with gestational age.

A thorough clinical examination of the newborn can detect an abdominal mass in the renal lobe of 0.8%, with one or two-fold identification being very important. The appearance of other clinical signs such as edema, oliguria, or complex malformation context (and renal involvement) can guide the diagnosis to a kidney disorder.

Also, the detailed anamnesis can give us a clue about renal pain in the context of oligoamnios, perinatal asphyxia, coagulation disorders, polycythemia, thrombocytosis, thrombocytopenia, sepsis or maternal drug use.

If the first postnatal ultrasound does not reveal dilatation and the kidney size is normal, the child does not require further investigation and it is recommended that the ultrasound re-evaluate that at one year of age; if the second ultrasound is normal, it is no longer necessary to reassess the child asymptomatic, but if the ultrasound reveals dilatation then it is necessary to perform a urethro-histogram to exclude the vesicoureteral reflux [6].

Depending on the degree of hydronephrosis and lateral or bilateral affection, the subsequent therapeutic course of antibiotic prophylaxis will be decided to prevent recurrent urinary infections until surgical correction of the defect.

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# LATE DIAGNOSIS OF RIGHT CONGENITAL DIAPHRAGMATIC HERNIA

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**Abstract**

Congenital diaphragmatic hernia is one of the most challenging malformations associated with high mortality. It is defined by the presence of an orifice in the diaphragm that allows passage of the abdominal viscera into the thorax.

Right side diaphragmatic hernia is rare (12-15%) as compared to left side (85-88%) with overall incidence of 1 in 5000 live births. Risk factors associated with poor outcome include low birth weight, prematurity, associated structural anomalies, and chromosomal defects. Treatment is a topic which depends on size and location of the defect. This is a case of isolated CDH diagnosed at 8 month postnatally. The patient was diagnosed after a respiratory infection occured and and a X- ray of the chest was taken.

The successful management of this case is presented.

**Keywords:** Right congenital diaphragmatic hernia (CDH), late diagnosis, infant

**Introduction**

Congenital diaphragmatic hernia (CDH) is a defect that occurs in 1 in 3.000-5.000 live births, of which approximately 60% occur in isolation without other congenital anomalies. This is a rare congenital anomaly of the diaphragm that occurs due to poor embryogenesis with atrophy of the diaphragm muscle fibers and loss of muscle tone. It is more frequent on the left side (85-88%), and bilateral cases have been reported, male predominance is also recognized (2:1 ratio)

Neonatal CDH is a well-recognized entity, but its presentation beyond the neonatal period varies, giving rise to erroneous clinical and radiological diagnoses. In contrast to the high neonatal mortality and morbidity rates for CDH, the prognosis for late CDH hosts if diagnosed early is generally favorable [1,2]. CDH is the result of incomplete closure of the normal pleuroperitoneal canal during fetal development. Most cases are diagnosed before birth or in the neonatal period. However, 5% to 45.5% of the CDH may appear asymptomatic during the neonatal

period, to manifest itself in childhood and adulthood. The congenital defect is identical in neonates and older patients, but the approaching and complicating symptoms of CDH in older patients differ considerably from those found in newborn patients. Although the exact etiology of most cases of congenital diaphragmatic hernia remains unknown, there is increasing evidence that genetic factors play an important role in the development of CDH. Chromosomal abnormalities have been identified as an important etiology for non-isolated CDH. In most published cases, chromosomal abnormalities were identified using a combination of anal chromosome bands-GYsis and/or fluorescence in situ hybridization(FISH). The use of new technologies, such as comparative genomic hybridization based matrices (arrayCGH) - is likely to increase the number of chromosomes identified in individuals with CDH and may aid in the identification of CDH-related genes. Trisomies 13, 18, and 21 and 45, are the commons aneuploidías described in association with CDH [1,3]. Embryologically, the etiology of CDH is postulated as the abnormal migration of myoblasts from the superior cervical somites in two of the four embryological structures that contribute to the development of the diaphragm as septum transversum beginning at week 4 of gestation and the pleuroperitoneal membrane at 8-12 weeks of gestation. Thomas hypothesized the involvement of altered myoblast growth in the pleuroperitoneal membrane, when the abdominal viscera return to the peritoneal cavity prematurely [2,4].

**Case presentation**

A 8 month old female infant was transferred from another clinic with the suspicion of a diaphragmatic hernia. The infant had a pulmonary infection and the parents brought her to the hospital because of respiratory distress. A X-ray of the chest was taken and a diaphragmatic right hernia was suspected (figure 1 and 2).

At arrival in our clinic the child had no respiratory distress syndrome with $spO_2$ =99%, with no dyspnoea or other clinical signs suggestive for a diaphragmatic hernia.

The patient was admitted in our Pediatrics department, where it received treatment for the respiratory infection. The nasal exudate reveiled an infection with Streptococcus pneumoniae for which the patient received local treatment with Ciprofloxacin 0,3%.

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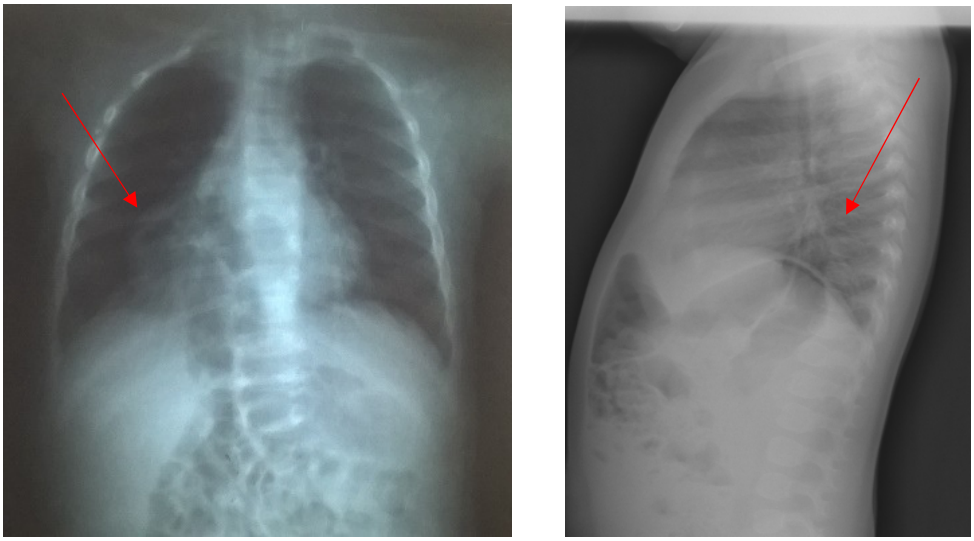

Figure 1, 2 - X-ray of the chest with colon loop in the right hemithorax.

18 days after she was transferred to our institution, the operation was scheduled.

At operation a median laparotomy was done. There was a large defect in the right diaphragm, approximately 4/3 cm. The hernial contents (colon loop) were reduced, the leaves of the diaphragm were dissected and the defect was closed in a single layer with nonabsorbable sutures. Thoracic drainage was not necessary, a small tear in the right pleura was sutured.

The postoperative period was uneventful. The patient could be extubated on the same day after the operation and was discharged on the 10$^{th}$ postoperative day.

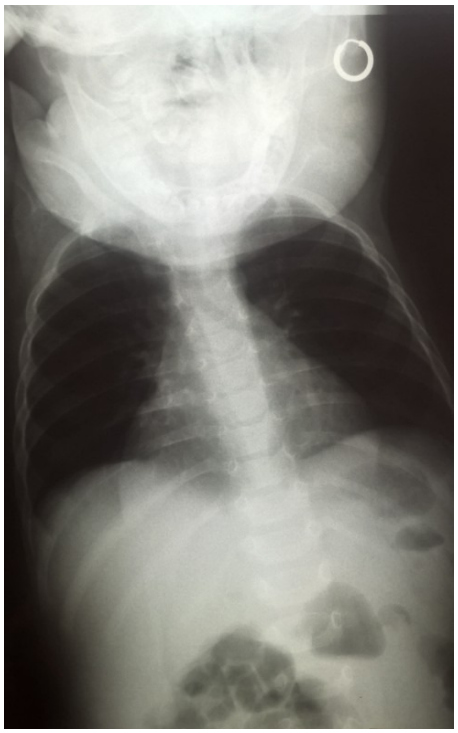

Figure 3 – postoperative chest X-ray with normal, expanded lungs and hemidiaphragms at the same level.

**Discussion**

Prenatal diagnosis by ultrasound detects more than 50% of CDH cases at a mean gestational age of 24 weeks. Three-dimensional ultrasound and fetal magnetic resonance (MRI) are other methods of prenatal diagnosis used in assessing the severity and outcome of the CDH. There is no prenatal diagnosis of CDH in this case. After birth the child did not show any signs of respiratory distress and had a normal development without medical problems until the age of 8 month.

Historically CDH was regarded a surgical emergency and the new born was rushed to the operating room for surgical correction. In 1987 Bohen et al. proposed a period of medical stabilization and delayed surgical repair in an attempt to improve the overall condition of the neonate.

The surgical repair can be difficult in right sided CDH because the size of the defect. The defect in the presented case was relatively large. Only a thin rim of diaphragm was present anteriorly and the posterior rim was fortunately present.

If the liver is herniated into the thorax the reduction of liver can be a difficult problem. Liver replacement in the abdomen can be complicated by kinking of hepatic veins causing profound hypotension. Potential anatomic anomalies such as possible hepatopulmonary fusion [6,7], anomalous venous drainage is uniquely associated with right sided defects.

Survival based on liver herniation alone is 43% as compared to 93% survival without liver herniation [8]. The series published by Fischer et al. [9] has shown the survival rate (right CDH 55% to left CDH 77%) ECMO requirement (right CDH 40% vs left CDH 15%) prosthetic material in right CDH vs left CDH (76% vs 41%) and abdominal wall (38% vs 19%) repairs. These data support that right side CDH carries a high mortality and morbidity. The repair of a CDH may be as variable as clinical management. The type of repair is dependent on the size of the defect. If the defect is small, a tension free primary surgical closure should be performed with non-absorbable sutures. If the defect is wide, primary closure may be attempted with a patch (Marlex, Goretex, Dacron) or a muscle flap (latissimus dorsi, serratus anterior).

Sometimes if the defect is not too large, the patient is diagnosed with delay and has only repeated pulmonary infections which eventually leads to a chest X-ray and the diagnosis of a right congenital diaphragmatic hernia.

**Conclusion**

Preoperative physiological stabilization and subsequent elective repair has become the corner stone of management of CDH like our case.

Presentation of right congenital diaphragmatic hernia beyond the neonatal period gives rise to erroneous clinical and radiological diagnoses. In contrast to the high neonatal mortality and morbidity rates for CDH, the prognosis for late CDH hosts if diagnosed and treated correctly is generally favorable

Success in this difficult case is optimized by the close cooperation between pediatrician, anesthetist and the pediatric surgeon.

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# PEDIATRIC SURGERY IN ROMANIA – A BRIEF HISTORY

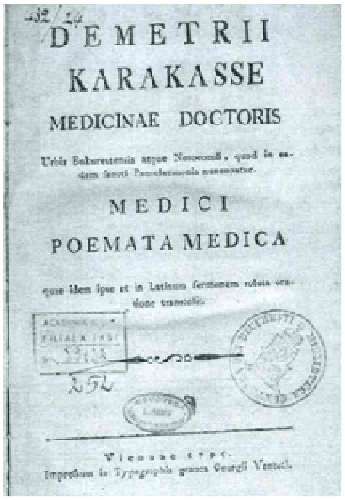
**Eugen Sorin Boia[1, 2], Ionut Adrian Dumitru[1, 2]**

**Abstract**

First hospital dedicated to children in Romania was founded in Bucharest in 1858 – Grigore Alexandrescu Children's Hospital and had two departments, Pediatrics and Pediatric Surgery, although pediatric surgery as a speciality did not existed for another nearly 20 years. Operations were performed by general surgeons. It was the first in the Balkan region. In Romania, in 1874, the Speciality of Pediatric Surgery and Orthopaedics appears by separation form General Surgery led by Professor Grigore Romniceanu. The History of Pediatric Surgery in the world is well documented especially in France where first developed. In Romania there is sparse information about the history of pediatric surgery and is concentrated more on specific personalities then the speciality itself. A thorough research and honest narration of information needs to be conducted to gather all this information on a systematic exposure as we consider the history plays an important role in the evolution of an entity.

**Keywords:** pediatric surgery, Romania, Timisoara, history.

**Medicine in Romania.** History of medicine worldwide is well documented, but in Romania there is sparse information, especially about Pediatric Surgery. The 18th century came with great advancements and development all over the world and our lands were no exception. We can say that the medicine in our country begun at the dawn of the 18th century. The first hospital in *Wallachia* - *Coltea Hospital* from Bucharest, was built in 1695-1714 on the initiative of Mihail Cantacuzino under the reign of Constantin Brancoveanu. The hospital was built at the same time with *Coltea Monastery* and had 24 beds. Not long after, in 1735-1750, Grigore Ghica built *Pantelimon Monastery* and *Pantelimon Hospital*. However, there were no doctors with training in *Wallachia* at that time, and the medical staff consisted of *bărbieri and felceri.*They did, among other duties, minor surgery, dental extractions, ortopedic reductions of fractures, tatoos, circumcisions, taking blood samples or assisted births. The first – true – romanian doctor was Dumitru Luca, or Dumitru Caracaş, as was said later by the ottomans. Was born, not known very well, either in 1728 or in 1730. He graduated medicine and philosophy in Vienna from where he returned in 1782 and settled in Craiova. After few years, in 1784, he moved to Bucharest to the call of Mihai Şuţu and named the general doctor of the city of Bucharest and the head of Pantelimon hospital. Dumitru Caracaş has been constantly concerned with the care of his patients and not only. His medical preoccupations extending to the prevention of illnesses and the education of romanians for good hygiene and healthy eating. He was the one who, for example, recommended the potato culture in our country. (1)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*Nicolae Crețulescu (1812-1900)* was a nobleman, direct descendent of Brâncoveanu family. Studied medicine in Nantes, France. He worked as a doctor at Colțea Hospital where he created a school of surgery. He was also a very powerful political person. After the 1848 revolution is exiled in Constantinople where he practice medicine in a military hospital. Came back in 1849 and continue his work at Colțea Hospital. Later in 1857, together with Carol Davila founded the first faculty of medicine in Romania. As a prolific political person had many important positions as Senator, President of Senate, President of The Council of Ministers, Minister of Internal Affairs, Minister of Justice, Minister of Finance, three times Prim-Minister of Romania and many others. Nicolae Crețulescu was a founding member of Romanian Academy (2,3)

Until 1828, in Bucharest were 8 doctors with a diploma, but unfortunately we did not had any medical school to train doctors or any other medical staff. This matter was about to change with the great contribution of Doctor Nicolae Crețulescu (Kretzulescu) and Doctor Carol Davila. In 1857 they created *The National School of Medicine and Pharmacy* – the first faculty of medicine in Romania. Later this school will become Carol Davila University of Medicine and Pharmacy form Bucharest. In 1869, studies at The National School of Medicine and Pharmacy became equivalent to the studies of other faculties of medicine in France and later in Italy. (1-4)

*Carol Davila (1828-1884)* on his real name Carlo Antonio Francesco d'Avila was a Romanian pharmacist and doctor of French origin, born in Italy and with medical studies in Germany and France. He came in Romania in 1853 at the age of 25 at the call of Barbu Știrbei to organize Romanian medical system. He had many health problems during his life as he developed a palsy on one arm, typhus fever, anthrax and tuberculosis. Despite all his problems he remained faithful on his profession and built step by step the Romanian medical system. Only few of his accomplishments can be mention on this brief history lesson. 1857 – with the help of Crețulescu founded The National School of Medicine and Pharmacy. Created pharmaceutical and veterinary education system. Created orphanages and schools for children with disabilities. Introduced free healthcare for the poor. Because of him, the service of military ambulances and sanitary trains was prepared early and tens of thousands of lives were saved. He eradicated many epidemics. As prince Carol said to Queen Elizabeth: *Davila is everywhere you need him.* (4,5,6)

**Pediatric surgery worldwide and in Romania**. Pediatric surgery is relatively new in the world compared with general surgery. Midwives and nurses cared for sick children at home, and foundling homes often associated with monasteries or a cathedral looked after abandoned, unwanted children. The death rate at these institutions was high, possibly because more attention was paid to salvation of soul than the child's life. Before 19th century there were no doctors or hospitals in the world dedicated to children. Children could be admitted to adult hospitals, but most physicians felt frustrated because there was little they could do for the sick infants. In Europe, in 1614 King Louis XIII of France ordered that children to be treated separate form adults at Lyon City Hospital and a surgeon named Mosnier was assigned to the children. This separation remained unchanged in France until the end of 18th century. The first independent hospital for children in the world was opened in 1802, in Paris, France. In 1844, Paul Guersant (1800-1869) created the first Pediatic surgery department at this Hospital. At that time he wrote a book called *Notices sur la Chirurgie des Enfants* , which is the very first known book about pediatric surgery. This remarkable book covers the full range of pediatric surgery from traumatology to the external birth defects and tumors. Paul Guersant is considered one of the pioneers of pediatric surgery. Professor Guersant noted the ability of fractured bones to mold and heal, or the ability of children to fully recover from tuberculosis. He operated hydrocele, tonsillectomies, rectal polyps, bladder stones, treated burns with cold water and glycerine dressings and if the wound would be infected he used chlorinated soda anticipating so antisepsis. He also operated cleft lip, punctured imperforated anus or performed colostomies. Guersant was truly a surgeon for the whole child. Other Children's hospitals in Europe appeared at least 30 years later, St. Petersburg – 1834, Vienna – 1837, Moscow – 1842, Prague – 1842, Berlin – 1843, Graz – 1844, Copenhagen – 1845, Munich – 1846. (7,8)

First hospital dedicated to children in Romania was founded in Bucharest in 1858 – Grigore Alexandrescu

Children's Hospital and had two departments, Pediatrics and Pediatric Surgery, although pediatric surgery as a speciality did not existed for another nearly 20 years. Operations were performed by general surgeons. It was the first in the Balkan region. In Romania, in 1874, the Speciality of Pediatric Surgery and Orthopaedics appears by separation form General Surgery led by Professor Grigore Romniceanu. Grigore Romniceanu studied medicine at The National School of Medicine and Pharmacy after which he obtained his Doctor of Medicine degree in Paris in 1869. Was a surgeon at Children's Hospital in Bucharest and the Dean at the Faculty of Medicine in Bucharest between 1887-1894. (9)

**Pediatric surgery at Timisoara.** Children's hospital was founded in 1902 with the support of a businessman from Arad named Antal Sailer. In 1913-1914 Pediatric Surgery Department is established with 10 beds and having Dr. Titus Rusu as Head of Department. In 1945 the hospital becomes a Univesitary Clinic led by Dr. Iosif Nemoianu and the Pediatric Surgery Department becomes Pediatric Surgery Clinic. 1950 – all subunits unite under the name Unified Clinical Hospital Nr.3 for Children led by Dr. Rosianu Ioan – Pediatric surgeon. In 1994 – the name is changed to Louis Turcanu Clinical Children's Hospital and 2 operating theaters are being built with german sponsoring. In terms of professional activity and educational progress, the Clinic evolved very much under the leadership of Professor Dr. Vasile Fufezan, a true founder of the Pediatrc Surgery School. He was a true leader, revolutionized neonatal surgery in this Clinic and modernized didactic activity. Master and worthy teacher, was respected by collaborators, disciples, students and colleagues. Among his collegues in didactic and clinical activity we name Dr. Constantin Duică, Dr. Leonida Ionescu, Dr. Mircea Socoliuc, Dr. Aurel Bulucea, Dr. Eugenia Sberea, and Dr. Pavel Tepeneu (also Head of Department). Starting 2010, a new era of pediatric surgery begun – minimal invasive surgery. First laparoscopic operation in our Clinic was performed 8 years ago by Prof. Dr. Boia Eugen with the help of Dr. Pantea Steilian (from General Surgery). Today the Clinic is equipped with 4 individual laparoscopic systems, including a 3D one. Until 2017 we had 692 laparoscopic interventions. Since 2012, under the aegis of EUPSA (European Paediatric Surgeons' Association) we organize every year qualified course of Minimal Invasive surgery training with well-known personalities from around the world with hands-on sessions. Pediatric Surgery Department is part of Romanian and International Pediatric Surgery Associations, naming SRCP (Romanian Society of Pediatric Surgery), ARCPMI (Romanian Association for Minimal Invasive Pediatric Surgery), ESPES (European Society of Paediatric Endoscopic Surgeons), EUPSA, WOFAPS (World Federation of Associations of Pediatric Surgeons).

**Pioneers of Pediatric Surgery in Romania.** *Professor Dumitru Vereanu (Bucharest)* was the first specialist in Pediatric Surgery in Romania and was the Head of Department at Pediatric Surgery and Orthopedics at Grigore Alexandrescu Children's Hospital. He recounts in his book "From the Memories of a Child Surgeon" his first experience in the European scientific world - a bridge made by participating in 1960 at the International Pediatric Surgery congress in Prague. It was hard to get his passport, although he was invited at the expense of the organizers. There he presented an original Romanian contribution: esophagoplasty with a gastric tube made of the greater curvature of the stomach. It was the Gavriliu procedure. There were presented the cases operated by Professor Dan Gavriliu in children, as well as those performed with very good results by Professor Vereanu. At the congress, he met many surgeons from around the world (some knew only from the literature). This was how the bridge was established and strengthened: knowing what was new in the clinics in Europe and presenting the Romanian experience. As a note, first esophagoplasty with stomach – the Gavriliu procedure, was performed in 1951 by Professor Dan Gavriliu in a child of 14-15 years old who had a burnt esophagus. Professor Vereanu was also the one who trained Professor Pesamosca. *Professor Gabriel Ionescu (Iasi)* was the Head of Department at Pediatric Surgery of St. Mary Children's Hospital form Iasi and the Dean of Grigore T. Popa University of Medicine and Pharmacy form Iasi in the '90s, after which he left Romania and went to South Africa where he promoted Romanian pediatric surgery school as the Head of Department at Pediatric Surgery form Pretoria Academic Hospital form South Africa. His name is linked to many inovations in surgical oncology and pediatric surgery. He got in the spotlight when in 1983 participated at the operation for separation of the conjoint twins *Lina* and *Gherghina* – 3rd case as complexity in the world up to this day. *Professor Vasile Fufezan (1928-2000, Timisoara)* was Head of Department at Pediatric Surgery in Timisoara between 1982 and 1994. He was a true founder of the Pediatrc Surgery School in Timisoara and not only. He was a true leader, revolutionized neonatal surgery in this Clinic and modernized didactic activity. Master and worthy teacher, was respected by collaborators, disciples, students and colleagues. It is best known for two personal surgical techniques, one is the use of azygos vein patch for enhancing the esophageal anastomosis in esophageal atresia repair and the other is the use of omphalocele membrane for staged closure of the defect instead of excising it and using synthetic membrane. *Professor Alexandru Pesamosca (1930 – 2011, Bucharest)* it is perhaps the most famous Romanian Pediatric surgeon. He was hated and loved at the same time by his colleagues as he used to operate any case leaving nothing for the rest, himself claimed to have operated over 45 000 cases during his lifetime. In 1970 had his doctoral thesis *Contributions in the diagnosis and treatment of ano-rectal malformations*. 1972-1984 is Head of Department at Pediatric Surgery in Grigore Alexandrescu Children's Hospital. Had written 390 scientific papers, 5 books and made 20 medical films. Between 1972 and 1975 he performed the first operations in Romania in the thoracic cavity of the newborn. Among the great Romanian and international medical personalities with whom he worked, we name Denis Pellerin, Bernard Duhamel, Ion Juvara, Dan Gavriliu and Marian Ionescu.

Performed 452 esophagoplasties with colon making it among the largest series of single institution specific procedure in the international literature. He has contributed to Portal Hypertension treatment by operating over 100 cases and performing spleen-renal, spleen-suprarenal, spleen – ovary/testis, spleen-mesenteric vascular shunts. He was a pediatric surgeon for the whole child. In the last period of his life he used to live in his office, never leaving the hospital. *Professor Iacob Iacobovici (Cluj)* was a general surgeon, but also operated children as at that time there were no pediatric surgeons. Was Head of Department at Pediatric Surgery in Grigore Alexandrescu Children's Hospital and is considered one of the founders of medical school in Cluj. He introduced the Iacobovici procedure – resection of the first rib and phrenic nerve. *Professor Alexandru Cosacescu (1887 - 1951)* was born in a town in Buzau county and he graduated medicine in Bucharest. Although he was a general surgeon, contributed to development of pediatric surgery as he published the first course of Pediatric Surgery and was Professor of Pediatric Surgery and Pediatric Orthopedics since 1942 in Bucharest. *Professor Tudor Zamfir* known for his personal procedure of triceps brachii disinsertion in the treatment of elbow ankyloses in children. This procedure is found in the International book Campbell's Operative Orthopaedics. Other outstanding personalities who had great contributions to Pediatric Surgery in our country *are Mircea Socolescu, Toma Dicescu, Nicolae Niculescu*, but there is little to none available information about. (10, 11)

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# HOLLOW VISCUS INJURY IN CHILDREN – A PRACTICAL REVIEW

**Flavius Bulgaru[1,2*], Constantin Tica[3], Florin-Daniel Enache[3]**

**Abstract**

Injuries in children have become a major cause of morbidity and mortality. The material used for this retrospective statistical study consists of a lot of 248 children, from whom 11 with hollow viscus lesions due to blunt abdominal trauma of different causes, hospitalized in the Clinic of Pediatric and Orthopedic Surgery of "St. Andrew" Emergency County Hospital of Constanta between 2011 and 2017. The methods of diagnosis and treatment were compared to those in the literature. We have studied over 150 articles from the literature using online search engines and PubMed, Med-Line, Clinical Key, Ovid databases.

Hollow viscus injuries are inconstant lesions after blunt abdominal trauma in children. A solitary lesion of an abdominal organ has a better prognosis then multiple injuries. The morbidity and mortality increase with more organ lesions. A severe prognosis is associated with brain injuries and coma.

**Keywords:** blunt abdominal trauma, abdominal injury, hollow viscus injury, children

**Introduction**

Trauma is the main cause of morbidity and mortality in children [1]. Abdominal lesions represent 10% of the causes of death, the other 90% are due to road accidents, sports or child abuse [2]. Blunt abdominal trauma is the most frequent cause of injury in children due to traffic accidents [3]. Blunt trauma may be caused by direct blows, crushing lesions, blast and deceleration forces. Any abdominal organ may be affected without any superficial evidence of trauma [4]. Injury of the stomach, duodenum, small intestine, bowel or bladder are infrequent during blunt trauma of the abdomen. The interval of hollow viscus injury in children is between 1% to 8.5% [5,6]. In these cases there is always a delay in diagnosis which goes to an increase in morbidity and mortality, especialy when a head trauma is associated [7].

**Purpose**

A review of hollow viscus injury in children and a comparative study was carried out between the literature and the methods of therapeutic management used in the Clinic of Pediatric and Orthopedic Surgery of "St. Apostol Andrei" Emergency Clinical County Hospital of Constanta. There were reviewed all cases of blunt and penetrating abdominal trauma with injury of hollow viscus like the stomach, duodenum, small intestine, bowel and urinary bladder.

**Material and methods**

We have studied over 150 articles from the literature using online search engines and PubMed, Med-Line, Clinical Key, Ovid databases. Terms such as *abdominal trauma, blunt abdominal trauma, abdominal injury, hollow viscus injury* have been used. Scientific articles, controlled randomized trials, protocols, meta-analyzes, and reviews have been checked. This review allowed us to make a synthesis of the methods of therapeutic management for hollow viscus injury in children used in the Clinic of Pediatric and Orthopedic Surgery of "St. Apostol Andrei" Emergency Clinical County Hospital of Constanta.

**Results**

We've made a retrospective statistical study between 2011-2017 on a group of 248 cases of abdominal trauma in children between 0-18 years of age. From these casee, 11 of them had an associated hollow viscus injury.

The study was conducted using data from the observation sheets and the operator protocol attached to them.

The history, symptoms, and clinical signs of peritoneal irritation syndrome, and possibly internal bleeding (in case of lesional associations of parenchymal organs), are directed to the diagnosis. Abdominal pain, central symptom, muscle contracture, pathognomonic sign or the most prominent form of muscle contraction were reported in 11 patients, evoking peritoneal irritation syndrome.

The etiological spectrum of the cases investigated in this study can be summarized as follows:

- road accidents – 5 (45%);
- falls from heights – 4 (36%);
- direct blow – 2 (19%).

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As in adults, first place in the ehiological causes of children trauma is occupied by road accidents, followed in frequency by falls from heights and direct blow (play accidents or aggression).

Given the fact that road traffic accidents have the highest share as the cause of trauma in general and abdominal injuries in particular, there was a predominance of urban patients. Globally, out of the 11 cases of hollow viscus injuries, 8 (73%) came from urban areas and 3 (27%) from rural areas. I this group 7 cases were boys and 4 cases were girls.

Distribution by age group shows that the most affected age groups are those of pre-school and school children when they are no longer under the direct supervision of parents, being more exposed to accidents of any kind (Table 1).

Of the 11 cases studied, 55% were solitary hollow viscus injury, and 45% of cases were associated with other lesions, abdominal or extra-abdominal. The distribution by age groups from this point of view is presented in Figure 1.

The frequency of associated lesions in the 11 cases studied is as follows (Table 2).

Table 1. Age group distribution of hollow viscus injuries.

| Age group | 1-3 years | 4-6 years | 7-10 years | Over 10 years |
|---|---|---|---|---|
| No. of Cases | 1 | 2 | 8 | 0 |

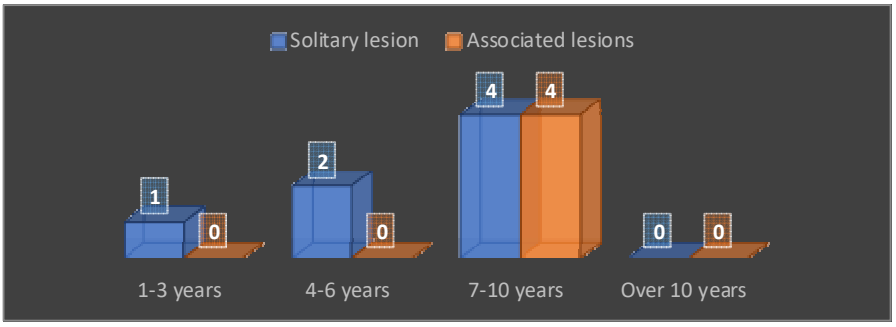


Figure 1. Lesions by association and age group.

Table 2. Associated lesions.

| Type of lesion | No. of cases |
|---|---|
| Cranio-cerebral | 4 |
| Facial | 1 |
| Pelvis fractures | 2 |
| Limb fractures | 3 |
| Sold organ injuries | 5 |

Associated trauma increase the severity of the case, so the combination of a cranio-cerebral lesion increases the risk of death of the child to over 30%, and if the brain injury is accompanied by coma, the risk increases to over 75% [7].

Of the 11 children with abdominal trauma that had cavitary organ injuries, 5 were hospitalized in a haemorrhagic shock and two other with coma of varying degrees, the rest not having any of the above.

In abdominal trauma with hollow viscus involvement, the site of the lesions was as follows (Figure 2).

The treatment used in these 11 cases was mainly conservative, with local sutures, with only one segmentary colectomy.

Abdominal CT scan correlated with clinical signs and paraclinical tests oriented the diagnosis and so, the time elapsed until surgical abdominal exploration was as short as possible (Table 3).

Postoperative evolution was favorable for healing in most cases, except for 2 cases, with severe injury which went to exitus in spite of all treatment efforts.

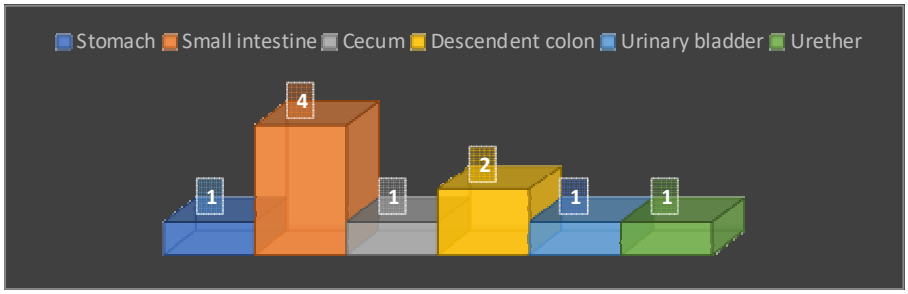


Figure 2. Hollow viscus injuries.

Table 3. Time elapsed until surgery.

| Time | 2 hours | 3 hours | 5 hours | 6 hours | 24 hours | 48 hours |
|---|---|---|---|---|---|---|
| No. of cases | 1 | 1 | 2 | 2 | 2 | 1 |

**Discussions**

Trauma represents the main cause of death among patients aged 12–45 years [8]. Injuries of hollow viscus organs after blunt abdominal trauma is an infrequent diagnosis [9].

There are three main mechanisms that can cause distinct type of lesion to hollow organs [10]:

a. a crush injury that occurs as the stomach, jejunum, ileum, or transverse colon is compressed violently against the spine. After this type of injury may appear hematomas, lacerations, or partial or complete transections;
b. shoulder-belt and seat-belt injuries are patterns of burst injury that occurs when rapid compressive forces are applied to a filled and distended hollow organ, without direct mechanical compression;
c. Rapid acceleration–deceleration may cause shear injury of an organ that is tethered at one end, such as the ligament of Treitz, ileocecal region, or rectosigmoid junction.

In case of blunt abdominal trauma, lesions of solid organs are diagnosed quickly because of hemodynamic instability, but injuries of hollow viscus are not usually discovered unless there are clear signs like peritonitis and hemodinamic instability due to sepsis [11-13]. A delay in diagnosis and in treatment may increase morbidity and mortality [12].

*Stomach*

There was one stomach injury caused by car accident that also caused liver haematoma and spleen laceration. The patient needed laparotomy and suture of the perforation and packing of the spleen. Good prognosis.

*Small intestine*

There were 4 cases of perforation of the small bowel. All except one were on the anti-mesenteric border. All of them were victims of motor vehicle accidents as passengers. One of them was brought to the resuscitation room in coma with GCS 3, multiple organ failure and exitus in less then 24 hours after admission. The other three were treated by laparotomy and direct suture of hte lesions, good prognosis after surgery. Broad-spectrum antibiotics were administered postoperatively.

*Bowel*

There were three patients with lesions of the bowel, one of the cecum – a serosal haematoma, which was treated conservatively and two patients with lesions of the descendent colon, one was a serosal haematoma and the other a small lesion, under 1 cm which was sutured.

In colon injuries, particularly if there is a delay, for sure there is a significant fecal contamination. Colostomy is necessary with a defunctionalized distal mucous fistula or a Hartmann pouch. If isolated colon injuries occur and are repaired early, with irrigation of the colon, bowel anastomosis, and antibiotherapy, avoid the complications

after surgery [10]. Broad-spectrum antibiotics and Metronidazole for anaerobic germs were administered after surgery. Good prognosis after surgery.

*Urinary bladder and urether*

One patient had urinary bladder lesion and one patient a rupture of the urether. The urether was ruptured at about 4 cm down to the pelvis of the kidney, with associated kidney dilaceration. A nephrectomy was mandatory. Good prognosis after surgery. The patient with urinary bladder trauma had also liver and spleen laceration, with massive haemoperitoneum, brain injuries and multiple fractures of the limbs, GCS 3, with exitus within a few hours after admission,

.

**Conclusions**

Hollow viscus injuries are inconstant lesions after blunt abdominal trauma in children. For a good prognosis, the diagnosis and therapy must be quick in order to avoid the disemination of bacetria in the peritoneal cavity and also the disemination of urine in case of urinary tract lesions, which may go to uroperitoneum.

Ultrasonography and CT scan after abdominal injuries are the imagistic methods of choice. They must be correlated with clinical signs and paraclinic tests.

A solitary lesion of an abdominal organ has a better prognosis then multiple injuries. The morbidity and mortality increase with more organ lesions. A severe prognosis is associated with brain injuries and coma.

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# OXIDATIVE STRESS AND MICROBIOLOGICAL ASESSEMENT IN AGGRESSIVE PERIODONTITIS - A CASE REPORT

**Simina Boia[1], Delia Muntean[2], Florin Horhat[2], Nicolae-Constantin Balica[3], Eugen-Radu Boia[3], Claudia Borza[4]**

**Abstract**

We present the case of a 17 years-old male with aggressive periodontitis who underwent periodontal therapy along with a 7-day antibiotic regimen.

**Keywords:** aggressive periodontitis, antibiotics, oxidative stress

**Introduction**

The oral cavity is a very complex and unique environment characterized by numerous interactions between different surfaces: soft and hard tissues, food, air and microorganisms (1).

Periodontal diseases are common inflammatory conditions which manifest as a loss of supporting connective tissue and alveolar bone around teeth, and if they occur in an aggressive form it can lead to tooth loss before the age of 20 years (2, 3). Aggressive forms of periodontitis usually affect young individuals at or shortly after puberty and presents a rapid rate of progression (4). It is recognized that the majority of periodontal tissue destruction is caused by abnormal host responses to microorganisms and their products (5), especially *Aggregatibacter actinomycetemcomitans (Aa),* which has been implicated in the etiology of in localized juvenile periodontitis and is associated with some forms of adult chronic periodontitis (6).

The non-surgical periodontal treatment (scaling and root-planing SRP) does not always lead to the microbiological changes necessary for maintaining the long-term stability of the clinical results. Therefore, the use of systemic antimicrobials as adjunctive to SRP have the potential to affect periodontal pathogens via gingival crevicular fluid at subgingival areas insufficiently reached by mechanical instrumentation (7). The combination of metronidazole and amoxicillin (AMX + MTZ) as adjunctive to SRP, has shown promising results in the treatment of both aggressive and chronic periodontitis (8-11). Combining AMX+ MTZ results in a synergisticbactericidal effect that in turn reduces the time and dosage level required to obtain optimal effect, and ultimately minimizes the toxicity of both drugs (7).

Oxidative stress (OS) arises when there is an imbalance between oxidants and antioxidantsand its increase is involved in the progression of diseases like diabetes mellitus, cardiovascular diseases and periodontitis (5). Recently, a method for measuring reactive oxygenmetabolites (ROM) in bloodsamples has been developed, which was recognized to be useful for the evaluation of oxidative stress in the organism (12).

**Case report**

We present the case of a 17 years-old young man, non-smoker and with no systemic disease who accused gingival bleeding and pain when brushing.The patient underwent a clinical and radiographic examination that assessed the following parameters: periodontal pocket depth, clinical attachment level [measureed at six sites per tooth (mesio-buccal, buccal, disto-buccal, disto-lingual, lingual, and mesio-lingual) at all teeth, to the nearest millimeter with a periodontal probe (PCPUNC 15, Hu-Friedy, Chicago, IL, USA), and using the cement–enamel junction as a reference point for the clinical attachment level], full mouth bleeding score and full-mouth plaque score. The evaluation results were recorded in a periodontal chart (http://www.periodontalchart-online.com/uk/) that was subsequently saved in a pdf format, printed, and attached to the patient's observation file. Based on the clinical findings, the periodontal diagnosis was localized aggressive periodontitis (4).

After the clinical evaluation, samples of subgingival plaque were collected from the deepest periodontal sites in each quadrant using sterile paper points inserted into sterile sealed Eppendorf tubes and sent for polymerase chain reaction (PCR) testing that was performed with a commercial Micro-Ident® Kit (Hain Lifescience GmbH, Nehren, Germany). *Pg* and *Pi* were identified as well by this method along with *Aa.*

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In order to assess oxidative stess level, blood samples were collected from the antecubital vein, and transported to the laboratories of the Department of Pathophysiology of the Victor Babes University of Medicine and Pharmacy Timisoara, within one hour after the venipuncture. The d-ROM (derivatives reactive oxygen metabolites) test and BAP (biologic antioxidant potential) test were used to analyze reactive oxygen metabolites and biological antioxidant potential, respectively, by use of photometric methods (Diacron International®, Grosseto, Italy). d-ROM values of 658.9 U CARR indicated the prescence of very high level of oxidative stress and BAP values of 1507.3 µmol/L a high deficiency status of antioxidants.

After completing the measurements, all pockets with periodontal pocket depth ≥ 4 mm were scaled and root planed under local anesthesia with Gracey curettes (Hu-Friedy®, Chicago, IL, USA) and ultrasonic instruments (Piezon®250, Electro Medical Systems SA, Nyon, Switzerland) following the protocol used for One-Stage Full-Mouth Disinfection - OSFMD (13). As home care, the patients were advised to rinse their mouth twice daily for 2 min with a 0.2% chlorhexidine digluconate solution for 14 days and took a systemic antibiotic therapy consisting in AMX+MTZ, 500mg each, three times daily for 7 days.

After one month, the investigations were repeated. The patient was symptom-free, and no bacterial strains were identified. The patient reported no side ffects associated with the intake of the antibiotic treatment. d-ROM values decreased to 367.6 U CARR indicating a medium level of oxidative stress and BAP values increased to 2038.6 µmol/L, situtatig the patient near the optimal values of antioxidants.

**Disscussions**

*Aggregatibacter actinomycetemcomitans* is frequently associated with localized aggressive periodontitis, and is detected in higher numbers and frequency in aggressive than in chronic periodontitis (14). Its identification in our patient confirmed the clinical diagnostic. In the literature, there are strong indications that, *Aa* is resistant to mechanical treatment and its incomplete eleimination achieved by SRP only, may provide a poor clinical response (6, 15-17). Therefore, if identified, the adjunctive antibiotic threatment is compulsory for *Aa* suppression in the periodontal pockets.

Akalin et al. 2007 (18) showed that periodontitis patients have the tendency to be more inclined to a disproportion of pro-oxidants and antioxidants in comparison with healthy individuals. In this direction, a proper early diagnosis of the periodontal disease and the administration of the therapy, will help to obtain an improvement in both local and systemic control of the inflammatory precess.

In studies of D'Aiuto et al. 2010 (19) and Tamaki et al. 2008 (12) carried on chronic periodontitis patients, it was demonstrated that non-surgical periodontal treatment improved both periodontal clinical parameters and plasma d-ROM values, fact confirmed by our findings. Measuring systemic oxidative status in aggressive periodontitis patients may be useful for evaluating the effects of systemic stus on periodontal health.

**Conclusions**

Adjunctive antibiotic therapy to non-surgical periodontal treatment has a beneficial effect on suppressing bacterial load, improving clinical parameters and improving the oxidative balance.

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## MANUSCRIPT REQUIREMENTS

The manuscript must be in English, typed single space, one column on A4 paper, with margins: top – 3 cm, bottom – 2,26 cm, left – 1,5 cm, right – 1,7cm. A 10-point font Times New Roman is required.

The article should be organized in the following format: Title, Names of all authors (first name initial, surname), Names of institutions in which work was done (use the Arabic numerals, superscript), Abstract, Keywords, Text (Introduction, Purpose, Materials and Methods, Results, Discussions and/or Conclusions), References, and first author's correspondence address.