Our Experience in Treatment of Testicular Torsion in Children
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Abstract
The objective of the research was to analyze personal experience and world literature on the diagnosis and treatment of boys with testicular torsion and to improve the process of providing specialized care.

Materials and methods. The study included 141 boys with testicular torsion. 133 patients underwent emergency surgery, 8 patients underwent manual detorsion.

Results. Treatment was successful in 88 patients; in 53 cases, orchiectomy was performed.

Conclusion. Personal observations and the analysis of the literature on testicular torsion in boys indicate the need for early diagnosis and immediate surgery.

Keywords
testicular torsion; testicular detorsion; orchiectomy; orchiopexy; both testicle fixation

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1. Materials and methods of the research
The results of diagnosis and treatment of 141 children with TT who were treated in the surgical department of the Ivano-Frankivsk Regional Children’s Clinical Hospital over a period of 10 years (2007-2016) were analyzed. The patients’ age ranged within 1 month to 18 years. All the boys were hospitalized to the emergency department and examined: a complete anamnesis was collected, testicular examination and Doppler ultrasound examination were performed, the organs of the scrotum were palpated. In addition, all children underwent a standardized clinical examination.

Problem statement and analysis of the recent research
Testicular torsion (TT) is an emergency condition caused by twisting of the spermatic cord which results in strangulation of the blood supply leading to testicular infarction and organ loss [5, 9, 10, 14]. TT is one of the most common acute conditions accompanied by syndrome of hyperemic and swollen scrotum [1, 3, 4, 6]; it is reported to occur in approximately 90% of adolescents [2, 7].

The objective of the research was to analyze personal experience and world literature on the diagnosis and treatment of boys with TT and to improve the process of providing specialized care.

2. Results of the research and their discussion
There was a tendency toward the increase in the incidence of pathology during the following years (2007 - 9 cases, 2008 - 12 cases, 2009 - 13 cases, 2010 - 9 cases, 2011 - 18 cases, 2012 - 10 cases, 2013 - 11 cases, 2014 - 14 cases, 2015 - 19 cases, 2016 - 26 cases). Torsion of the left testicle was observed in 98 (70%) boys; torsion of the right testicle was found in 43 (30%) boys. Torsion of cryptococcal testicle was detected in 18 (12.8%) children. 1 (0.7%) child was at the age of 0 - 1 months; 15 (10.6%) children were at the age of 1 month - 1 year; 13 (9.2%) children were at the age of 1-3 years; 11 (7.8%) children were at the age of 3-6 years; 16 (11.3%) children were at the age of 6-12 years old; 85 (60.3%) children were at the age of 12-18 years. The degree of twisting of the testicle ranged from 180 to 10800. In 133 cases, surgery was performed (44 (33.3%) children underwent detorsion, ipsilateral and contralateral orchiopexy; 29 (21.9%) children underwent orchiectomy with contralateral orchiopexy, 24 (18.1%) boys underwent orchiectomy, 24 (18.1%) boys underwent orchiopexy and in 12 (9.09%) cases, detorsion was performed); manual testicular detorsion was attempted in 8 (5.7%) cases only.

Only 24 (17%) children were hospitalized timely (up to 6 hours). In this group, 18 boys were surgically treated, 3 boys underwent detorsion, and in 4 cases, manual detorsion was attempted.

64 (45.4%) children were examined 7-24 hours after TT. In this group, the auxiliary procedures including heating of the
testicle, injection of 0.5% solution of novocaine in the spermatic cord and dissection of the protein coat contributed to testicular viability. The following surgeries were performed: dystocia with the fixation of both testicles in 37 cases (including 2 boys with cryptorchidism); detoxification with the fixation of the ipsilateral testicle in 14 cases (including 4 boys with cryptococcal testicles); in 9 cases, detorsion was applied; in 4 cases, manual detorsion was attempted.

53 (37.6%) children were admitted more than 24 hours after TT. If treatment is delayed, adjuvant treatment is considered ineffective. In this group, only in 24 (including 4 cryptococcal testicles) cases, the testicles were saved, while in 29 (including 4 cryptococcal testicles) cases, orchiectomy alongside with the fixation of the opposite testicle was performed.

In the postoperative period, children received a comprehensive therapy program aimed at improving their hemoglobin level, strengthening the blood-testis barrier and spermatogenic epithelium, eliminating syndrome of testicular ischemia-reperfusion and testicular compartment syndrome, antibiotic therapy. There were no fatal cases among children with TT.

The success rate in treating TT depends on the disease awareness among the male population. Visiting a doctor in case of urgency is typical for patients as boys, especially adolescents, experience excessive shyness concealing their illness [8, 13]. Delayed treatment leads to late hospitalization and, consequently, the loss of the organ [11, 12]. The diversity of therapeutic tactics indicates the lack of a unified approach to treating patients with TT.

3. Conclusions

Physicians should always be attentive to boys with acute pain in the scrotum. Orchiectomy should not be the only procedure. It must be supplemented by the fixation of the contralateral testicle and the implantation of the testicular prosthesis when reaching puberty.

In the postoperative period, it is necessary to prescribe a comprehensive therapy program aimed at improving hemoglobin level, strengthening the blood-testis barrier and spermatogenic epithelium, eliminating syndrome of testicular ischemia-reperfusion and testicular compartment syndrome, antibiotic therapy.

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