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## ABDOMINAL PAIN SYNDROME IN GIRLS, ADOLESCENTS AND YOUNG WOMEN WITH TUMOR-LIKE FORMATIONS OF THE UTERINE ADNEXA

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### Abstract

The article presents the clinical features of the complicated course of tumor-like formations of the uterine adnexa in girls, adolescents and young women. The characteristic symptoms of adnexal torsion are described. Topographic and anatomic features leading to torsion of ovarian cysts and uterine appendages, features of the surgical treatment of patients with complicated adnexal torsion are presented.

**The aim** was to study the frequency of occurrence of ovarian tumor-like formations and their complicated course in girls, adolescents and young women, improve early diagnosis and develop optimal methods of conserving surgical treatment of this pathology.

**Material and methods.** The study included 90 girls, adolescents and young women. Patients were divided into three groups. 1 group included 30 young women; the 2nd group consisted of 35 adolescents 13-17 years; 3 group consisted of 25 girls from 2 to 12 years. Diagnostic complex included clinical, special gynecological, comprehensive laboratory, ultrasound (including doppler ultrasound) research, computer and magnetic resonance imaging (if indicated).

**Results and discussion.** The final diagnosis of “Ovarian cyst” was verified in 46 of 90 patients (51,1 %): group 1 – 26 of 30 (86,6 %), in 2 – 18 of 35 (51,4 %), in 3 - 2 of 25 (8 %). It is established that the torsion of the uterine adnexa was detected in 44 of 90 patients: in 1 group – 13,3% of cases (4 of 30 young women), in 2 group – 48,5 % (17 of 35 adolescents), in 3 group – 92 % (23 of 25 girls). 76 surgeries were performed by laparoscopy with preservation of the ovarian reserve, 12 patients were treated conservatively with final diagnosis “Ovulatory syndrome” and “Retention cyst of the ovary”.

**Conclusions.** Ovarian cyst as the cause of abdominal pain is significantly more often diagnosed in young reproductive age than in patients of prepubertal and pubertal age. In girls and adolescent girls with symptoms of acute abdomen the torsion of intact uterine adnexa was significantly more common than in adult patients, due to anatomical features of the internal reproductive organs and more a mobile lifestyle inherent in this age group. Optimal treatment of functional ovarian cyst is complex conservative therapy, surgical treatment of ovarian cysts at a young age is conducted under strict indications, treatment of choice is laparoscopy.

**Key words: ovarian cyst; uterine adnexal torsion; girls; adolescents; young reproductive age; laparoscopy.**

The article presents the features of clinical manifestations and complications of urgent pathological conditions associated with acute abdominal symptoms in girls, adolescents, women of young reproductive age and optimal approaches to the choice of tactics for their diagnosis and treatment. One of the most common causes of abdominal pain syndrome among gynecological nosologies in patients of this population are tumors and tumor-like processes of the uterine appendages. The leading place among them is occupied by tumor-like formations of the ovaries (50–60% of cases); true benign ovarian tumors are less common (40–49.5%). Malignant tumors are relatively rare - 1.3% [1].

All patients with ovarian formations, which manifested with acute abdominal pain, require urgent differential diagnostic measures and surgical treatment, the main focus of which is organ-preserving operations.

Retention ovarian cysts are not an indication for surgical treatment, since both the follicular cyst and the corpus luteum cyst are dyshormonal diseases that develop against the background of increased production of gonadotropic hormones. The reason for the high frequency of operations in the presence of these formations is the frequent complications in the form of torsion and rupture of cysts due to the thinness of their structure with the

formation of either an ovarian hematoma or with the development of intra-abdominal bleeding [2].

The frequency of adnexal torsion accounts for 2-3% of all causes of acute abdominal pain. It can occur at any age, however, in children adnexal torsion without an organic cause is significantly more common than in adult patients, due to the anatomical features of the internal reproductive organs (the small size of the uterus and the relatively high location of the ovaries in the small pelvis) and physiological features (premenstrual hormonal activity, bladder overflow, juvenile constipation, increased intestinal motility), a more mobile way of life inherent to this age group. Torsion of intact ovaries is less common in women of young reproductive age - 1-2 per 100 thousand women. Its main causes are excessive length of the fallopian tube, funnel-pelvic ligament and the ovarian's own ligament, tortuosity and elongation of the mesosalpinx vessels, abdominal trauma, previous gynecological surgery and the presence of hydrosalpinx or pyosalpinx. Retention cysts, paraovarian cysts, teratoid formations etc. can be organic causes that contribute to the torsion of the uterine appendages. According to various authors, benign ovarian formations increase the risk of torsion by 11%. Malignant ovarian tumors carry a lower risk of torsion - only 2%. Due to the bending of the vascular bundles, the venous outflow is initially disturbed, but the arterial blood flow is preserved, therefore the ovary can remain viable from several hours to several days from the onset of the disease. This explains the low sensitivity of color Doppler imaging in assessing the degree of ischemia. There is a pronounced edema, hemorrhagic permeation of the ovarian tissue. Clinical manifestations are nonspecific, and children are not always able to formulate their complaints, this complicates the diagnosis [3, 4].

It is important to note that the central nervous system, starting from the antenatal period, controls the formation and development of the female reproductive system. One of the main critical periods in the formation of the female body and the functional state of its nervous system, neurohumoral relationships between the nervous and endocrine systems, is the period of puberty, in which complex neurohumoral changes occur, leading to the development of the reproductive function of the female body. Often, these changes under the influence of endogenous and exogenous influences lead to disturbances in the formation of physiological relationships in the hypothalamic-pituitary-gonadal system [5].

It should be noted that torsion of the uterine appendages occurs more often on the right, than on the left in a ratio of approximately 3:2. The increased risk of right-sided rotation is explained by the large amount of "free" space in the right side of the small pelvis compared to the left side filled with the sigmoid colon, the mobility of the cecum and ileum on the right.

The predominant localization of abdominal pain on the right side explains the high percentage of admission of patients with a preliminary diagnosis of acute appendicitis [6].

Despite the developed differential diagnosis programs, the correct diagnosis is timely established in only a quarter of patients.

The question of a choice of surgical tactics for the treatment of adnexal torsion is debatable. For a long time, the classical approach referred to carrying out organ-resecting surgeries, the rationale for which was a risk of thromboembolism after detorsion, dissemination in a malignant process, fears of malignancy of the affected ovary against the background of prolonged ischemia, as well as the opinion that purplish-cyanotic ovaries cannot recover in the post-operative period. Currently this issue is being widely discussed.

Analysis of the long-term observations has shown that risk of thrombosis, including pulmonary artery thromboembolism, at detorsion of twisted appendages is not higher than with removal of appendages without untwisting and is less than 0.2 % [7].

Having analysed the histotypes of ovarian tumors in girls after surgery for adnexal torsion, a number of authors from the USA noted an extremely low risk of detecting malignant tumors: only nine (1.5 %) cases of malignant tumors were identified out of 593 cases of ovarian neoplasms torsion [8].

Thus, at present guided by international experience and both taking into account upcoming motherhood of young patients some researchers recommend to use conservative treatment tactics for adnexal torsion whenever appropriate. Based on macroscopic data the restoration of tissue viability is carefully assessed after detorsion and adnexectomy or oophorectomy is performed in case of necrosis [9].

However, a number of authors adhere to the idea that the visual assessment of the adnexa after detorsion is biased for resolving the issue of adnexectomy, and today there are no objective methods that intraoperatively assess the viability of the uterine appendages after detorsion. Therefore, the question of the tactics of surgical treatment of adnexal torsion remains open.

Further study of this issue is required to clarify the state of the reproductive potential in girls, adolescents and young women with a history of torsion of intact/compromised uterine appendages.

**The aim** was to study the frequency of occurrence of ovarian tumor-like formations and their complicated course in girls, adolescents and young women, improve early diagnosis and develop optimal methods of conserving surgical treatment of this pathology.

**Material and methods.** The study included 90 girls, adolescents and young women. Patients were divided into three groups. 1 group included 30 young women (18-30 years old); the 2nd group consisted of 35 adolescents 13-17 years; 3 group consisted of 25 girls from 2 to 12 years. Diagnostic complex included clinical, special gynecological, comprehensive laboratory, ultrasound (including doppler ultrasound) research, computer (CT) and magnetic resonance imaging (MRI) (if indicated). The hormonal profile of the patients was studied. The levels of luteinizing hormone (LH), follicle-stimulating hormone (FSH), estradiol (E<sub>2</sub>), progesterone (PRH), anti-Müllerian hormone (AMH) were determined. Statistical analysis was carried out using the standard software packages “Stat graphics Plus 6.0” using the Student, Wilcoxon-Mann-Whitney, Fisher tests.

**Results and discussion.** All patients were admitted to the hospital with symptoms of an acute abdomen, the cause of which most often was assumed the presence of a tumor-like formation of the ovary. In the process of examination and differential diagnosis the final diagnosis of “Ovarian cyst” was verified in 46 of 90 patients (51,1 %). Moreover, in group 1 significantly more often than in groups 2 and 3: in 26 of 30 (86.6%), in 18 of 35 (51.4%), in 2 of 25 (8%), respectively ( $p < 0.05$ ). In younger patients of groups 2 and 3 acute abdominal phenomena were often caused by the presence of adnexal torsion, which was visualized by ultrasound as an ovarian cyst.

It is established that torsion of the uterine appendages was detected in 44 of 90 patients: in 1 group – 13,3% of cases (4 of 30 young women), in 2 group – 48,5 % (17 of 35 adolescents), in 3 group – 92 % (23 of 25 girls), respectively ( $p < 0.05$ ). Differential diagnosis was significantly complicated, since the clinical manifestations due to the presence of an ovarian cyst were nonspecific and similar to the clinical manifestations of an acute abdomen caused by adnexal torsion: lower abdominal pain of varying intensity (in 100% of cases), nausea (in 20% of cases), vomiting (in 30% of cases), an increase in body temperature to subfebrile, less often febrile numbers (in 20% of cases), tension of the anterior abdominal wall (in 60% of cases), positive peritoneal symptoms, palpation of a painful formation in the projection of the uterine appendages during gynecological examination (in 100% of cases), painful displacement of the formation. The leukocyte reaction was observed with approximately the same frequency (in 50-55% of cases) in all groups. In 12 (40%) patients of group 1 was revealed an increase in the level of C-reactive protein in the blood serum (patients with retention cysts against the background of exacerbation of chronic inflammation of the genitals). In patients of group 1 was established a decrease in E<sub>2</sub> (in 36.6%), PRH (in 40%), AMH (in 46.6%). Patients of group 2 showed a violation of the LH/FSH ratio (in

26.6%), an increase in the level of E<sub>2</sub> (in 20%) and a decrease in the level of PRH (in 73.3%). Hormonal disorders were found in adolescents with ovarian retention cysts on the background of menstrual dysfunction. In prepubertal girls the hormonal profile, as a rule, corresponded to age norms. Ultrasound showed an increase in the size of the formation (from 6.5×4.5 cm to 12×10 cm), a change in its structure and the presence of free fluid in the pelvic cavity or in the abdominal cavity, this complicated the differentiation of the ovarian cyst from the adnexal torsion. Doppler, CT, and MTP were used to confirm the preoperative diagnosis. Particular importance was attached to the results of assessing blood flow in pathologically altered tissues. Analysis of the autonomic nervous system state revealed sympatheticotonic, vagotonic, mixed types of autonomic dysfunction, the nature of which depended on the characteristics of the hormonal status and pathological changes in menstrual function. In the majority of patients, the clinical manifestations of autonomic dysfunction were expressed in the form of rapid heartbeat, headache, increased sweating, fluctuations in blood pressure, a feeling of coldness, numbness of the arms and legs, and a feeling of malaise. internal tremors, anxiety, hyperventilation disorders, increased fatigue, sleep disturbances.

In group 1 torsion of the ovarian cyst was observed in 4 patients, in the remaining 26 cases the acute abdomen was caused by cysts, 12 of which were retention. 18 surgical interventions were performed by laparoscopy, 12 patients were treated conservatively (anti-inflammatory treatment: antibiotics, non-steroidal anti-inflammatory drugs, - resorption, restorative therapy, hormonal drugs: combined oral contraceptives, gonadotropin-releasing hormone agonists, progestogens) with the final diagnosis “Ovulatory syndrome” and “Retention ovarian cyst”.

In group 2 isolated ovarian torsion was diagnosed in 8 patients, torsion of the paratubar cyst - in 3, torsion of the paraovarian cyst - in 4, torsion of the ovary and fallopian tube - in 2.

In group 3 isolated ovarian torsion was diagnosed in 18 patients, torsion of the paratubar cyst - in 2, torsion of the paraovarian cyst - in 2, torsion of the ovarian teratoma - in 1.

In groups 2 and 3 in 60% of cases torsion phenomena were observed on the right side, in 40% - on the left side. In groups 2 and 3 58 surgical interventions were performed by laparoscopy, 2 laparotomies (in torsion of teratoma of the right ovary and torsion with rupture of the cyst of the left ovary, complicated by intra-abdominal bleeding). Organ-preserving surgical treatment included intraoperative assessment of adnexal tissue status. Detorsion was performed provided with the saved blood flow and the absence of necrosis, whereas both absence of blood flow and the presence of necrosis regions led to the adnexal removal.

## Conclusions

1. Differential diagnosis of the causes of acute abdomen in girls, adolescents and young women should be carried out taking into account the age, clinical features, the results of a comprehensive examination with an assessment of the results of ultrasound, CT and MRI, which will contribute to the soonest adequate select of tactics of urgent gynecological care.

2. Ovarian cyst as the cause of abdominal pain syndrome is significantly more often diagnosed in young reproductive age than in patients of prepubertal and pubertal age.

3. In girls and adolescent girls with symptoms of acute abdomen the torsion of intact uterine adnexa was significantly more common than in adult patients, due to anatomical features of the internal reproductive organs and more mobile lifestyle inherent in this age group.

4. Clinical manifestations due to the adnexal torsion are nonspecific and similar to the clinical picture of an acute abdomen caused by the presence of an ovarian cyst, which complicates the differential diagnosis in urgent conditions.

5. The method of choice for treatment in urgent conditions associated with abdominal pain syndrome in girls, adolescents and young women should be considered minimally invasive surgery - laparoscopy with organ-preserving operations.

6. Further study of this issue is required to clarify the state of the reproductive potential in girls, adolescents and young women with a history of torsion of intact/compromised uterine appendages.

7. Considering that the prevalence of neurological and gynecological pathology in girls in recent years has increased significantly, the study of the features of the manifestation of neurological disorders in such patients is relevant and promising in terms of realizing the reproductive potential this contingent in the future.

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