

# The Significance of Ultrasound Dopplerography of the Scrotum in the Diagnosis of Acute Scrotum and its Effect on Treatment Strategy

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**Annotation:** Pain and swelling of the scrotum is a pathological sign that indicates the presence of inflammatory diseases of the testicles. It can be epididymitis, orchitis, epididymo-orchitis, dropsy, inguinal hernia and other pathologies. Ultrasound will show the condition of the scrotum organs, will allow you to assess their structure, density, integrity, and will also provide an opportunity to assess the quality of blood flow in the vessels. Ultrasound with a Doppler allows you to accurately identify such a pathology as testicular torsion. With such a disease, the normal blood supply to the testicular tissues is acutely disrupted, which leads to severe ischemia and subsequent necrosis. Most often, this pathology is a consequence of trauma to the scrotum.

**Keywords:** ultrasound dopplerography, scrotum, hydrocele.

**Introduction:** Enlargement of the scrotum can be a sign of diseases such as inguinal hernia, hydrocele, varicocele and others. Also, in such a situation, it is possible to suspect the presence of malignant or benign formations inside this male genital organ. Timely scrotal ultrasound will help determine the nature of the disease (infectious, inflammatory and other) and make an accurate diagnosis. Enlargement of the scrotum can be a sign of diseases such as inguinal hernia, hydrocele, varicocele and others. Also, in such a situation, it is possible to suspect the presence of malignant or benign formations inside this male genital organ. Timely scrotal ultrasound will help determine the nature of the disease (infectious, inflammatory and other) and make an accurate diagnosis.

The organs of the scrotum have a rather fragile structure and many small capillaries. In case of blows, bruises or unsuccessful actions of the surgeon during surgery, the capillaries are easily damaged, which will lead to hemorrhage and disruption of blood supply to the scrotum organs. To determine how seriously the blood flow has been affected after mechanical action, ultrasound will help.

Anatomical and mechanical factors, hormonal failures, and hereditary and biological factors can provoke non-prolapse of the testicles. If none of these reasons is confirmed by the results of clinical tests or a simple ultrasound, doctors prescribe an additional study – ultrasound. It is often shown to children, since this pathology is most often manifested in childhood. Performing ultrasound, the specialist receives the following data on the state of the scrotum organs:

During the development of the embryo, the testicles travel a long way from the place of primary laying (in the lumbar region) to the scrotum. They move through the anterior abdominal wall and may linger within the abdominal cavity or in the groin. When the testicle is not palpable in the scrotum, the ultrasound will help you find out for sure whether it is there or not. Normally, both testicles should be in the scrotum cavity. In this case, most often the left sex gland is located just below the right one. When the asymmetry of the testicles exceeds the normal value, the performed ultrasound shows exactly where the testicle is located.

The presence and amount of fluid in the membranes of the testicles

The main function of one of the membranes of the testicle is the production of fluid. This fluid helps the testicle to move freely in the scrotum cavity. There is a certain balance between the production of liquid and its reabsorption. When this balance is disturbed and fluid production outstrips its absorption, dropsy may begin. Ultrasound will help determine the exact amount of fluid in the membranes of the testicle.

The anatomical shape of the testicles is one of the primary factors that determine various pathologies of the genital glands. With palpation, it will not be possible to accurately determine the shape, but the ultrasound will give full information about it. Information about the clarity of the contours and the size of the testicles, which is provided by ultrasound of the scrotum with a Doppler, helps doctors to draw conclusions about the presence or absence of inflammation of the genital gland. It also helps in the diagnosis of tumor diseases, scrotal vascular ultrasound does not require special training. A man only needs to carry out basic hygiene before the procedure. For examination, a man needs to lie down on a couch, on his back or on his side (as the doctor says). A contact gel is applied to the surface of the scrotum and then scanning begins by leaning against an ultrasound sensor.

Ultrasound of the scrotum with Dopplerography is performed without stimulation of an erection, without injections of a contrast agent. The results are given to the patient immediately after the examination. Ultrasound dopplerography of the scrotum effectively differentiates emergency surgical situations and other etiologies in 84% of children with acute scrotal pain, but in 16% the result of ultrasound remains unclear, which requires surgical examination. A study was conducted on the importance of ultrasound dopplerography of the scrotum (DUS) in the diagnosis of acute scrotum and its effect on treatment tactics.

**The purpose of the study:** To establish the values of ultrasound dopplerography of the scrotum in the diagnosis of acute scrotum and its effect on treatment strategy

**Materials and methods of the study:** Seventy-nine children (average age 9.2 years) with acute scrotum were prospectively studied. The protocol included anamnesis, clinical examination, scrotal DUS and standard laboratory analysis. Depending on the results of scrotal surgery, the children were treated either non-surgically (normal or increased testicular blood flow) or surgically (reduced or absent testicular blood flow). A follow-up examination 6 weeks after discharge included scrotal DUS.

**The results of the study:** In 66 children (84%), the DUS result determined the treatment tactics; 26 children with hyperperfusion (epididymitis and orchitis), 18 children with testicular appendix torsion (ATT) and 9 children with normal perfusion (edema and hematoma) were treated nonoperatively. The control examination did not reveal testicular atrophy and confirmed the primary diagnosis. Ten children without testicular perfusion and suspected torsion and 3 children with orchitis and pyocele were examined surgically, and the initial diagnosis of DUS was verified again. In the remaining 13 patients (16%), the result of the ultrasound examination was unclear. Of these, 6 children did not comply with the requirements and refused to undergo ultrasound. Another 4 children were examined due to the persistence of symptoms. Testicular tumor was suspected in 3 more patients. All these 13 children underwent surgical examination, as a result of which inflammation (epididymitis) was detected in 6 children and acute ATT in 4 children, while suspicion of a tumor manifested itself in the form of post-acute ATT in 3 boys. In 84% of children with acute scrotal pain, acute surgical situations and other etiologies were differentiated. In 16% of our pediatric patients, the DUS remained unclear, which required surgical examination.

**Conclusions:** Thus, the introduction of additional stimulating or contrasting drugs by piercing the skin of the scrotum is not required for ultrasound. Harmful ionizing radiation does not affect the genitals during the examination. It follows that the procedure is safe and harmless. It can be prescribed to young children in the first year of life. The frequency of testicular ultrasound can be any, because this examination is safe. This is important when it is necessary to periodically assess the condition of the scrotum during treatment, because, for example, such types of diagnostics as CT or MRI are not allowed to be used often.

### List of used literature:

1. Akselrov, M. A., Minaev, S. V., Razin, M. P., Yusupov, Sh. A., Tsap, N. A., Tarakanov, V. A., ... & Grigorova, A. N. (2023). Treatment of cryptorchidism in pediatric surgical practice: a multicenter study. *Bulletin of Urology*, 11(1), 13-25.
2. Yusupov, S. A., & Khakimova, L. R. (2022). Modern information technologies in the service of quality education in the field of medicine. In *Topical issues of modern medical education: improving the training of medical personnel* (pp. 63-65).
3. Yusupov, Sh. A., Shamsiev, A.M., Shakhriev, A. K., Yusupov, Sh. Sh., & Sataev, V. U. (2022). Clinical justification of decompression of the small intestine in common appendicular peritonitis in children. *Experimental and clinical gastroenterology*, (1 (197)), 62-68.
4. Yusupov, S. A., Mukhammadiev, A. A., & Dzhalolov, D. A. (2020). Clinical and diagnostic features of Meckel's diverticula in children. In *Topical issues of modern science and education* (pp. 169-172).
5. Yusupov, S. A., Kurbaniyazov, Z. B., & Zayniev, A. F. (2018). Higher education institution of the shield-like deposit. the problem camp (a look at the literature). *Visnik naukovikh doslizhen*, (1).
6. Yusupov, S.A. 2024. Acute hematogenous osteomyelitis in children. *Educational Research in Universal Sciences*. 3, 2 SPECIAL (Jan. 2024), 330-335.
7. Makhmudov, O., & Yusupov, S. (2013). The possibilities of orthopantomographs in predicting the eruption of the lower heat of their molars. *Journal Bulletin of the doctor*, 1(4), 106-109.
8. Yusupov S. A. Diagnostic significance of ultrasound sonography in appendicular peritonitis in children // *BMJ*. 2009. No.3.
9. Shamsiev A.M., Yusupov Sh.A. Reproductive function of women who suffered from widespread appendicular peritonitis in childhood // *Avicenna's Bulletin*. 2019. №3.5. Yusupov, Shukhrat. "The diagnostics of postoperative abscesses of abdominal cavity in children." *Medical and Health Science Journal*, vol. 3, July 2010, pp. 56
10. Yusupov Shukhrat Abdurasulovich Assessment of the effectiveness of ultrasound sonography among children with appendicular peritonitis // *European science review*. 2017. №1-2.:
11. Shamsiev, A. M., Yusupov, S. A., Muhammadieva, L. A., & Yuldashev, B. A. (2017). Генетичні механізми формування та діагностики хронічного бронхіту в дітей. *Вісник наукових досліджень*, (1).
12. Шамсиев, А. М., Саидов, М. С., Атакулов, Д. О., Юсупов, Ш. А., & Шамсиев, Ж. А. (2010). Хирургическое лечение аноректальных пороков у детей. *Врач-астирант*, 40(3.2), 210-214.
13. Шамсиев, А. М., Атакулов, Д. О., Юсупов, Ш. А., & Суванкулов, У. Т. (2009). Влияние озона на процесс спайкообразования при эксперимента льном перитоните. *Медицинский вестник Северного Кавказа*, 13(1).
14. Шамсиев, А., Махмудов, З., Атакулов, Д., Бургутов, М., & Зайниев, С. (2010). Тактика хирургического лечения при остром гематогенном остеомиелите костей тазобедренного сустава у детей. *Журнал проблемы биологии и медицины*, (2 (61)), 42-46.