

## **Improving Ultrasound Diagnostics For Acute Spermatic Cord Cysts**

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**Annotation:** Testicular torsion is a surgical emergency that is caused by twisting of the spermatic cord and its content. This condition causes irreversible changes after 6 hours. Early recognition and management of testicular torsion is important for testicular salvage and preservation of fertility.

**Key words:** Cystic lesion, diagnostic tool, pathology, tumour, hypoechogenicity, torsion

After clinical examination, scrotal US is used as a first-line diagnostic tool in patients with symptomatic or asymptomatic lesions. Fluid-filled lesions with more or less well-defined margins are the most frequently seen pathologies, and this group includes both true cysts and fluid collections. Location of the lesion as well as the patient's age and symptoms are the basic elements for an anatomical and clinical classification of the lesion. Cystic lesions are diagnosed more rarely in children and adolescents than in adults and are usually of dysplastic or neoplastic origin. Gray-scale US possibly associated with Color-Doppler US and contrast enhanced US (CEUS) usually provide an accurate diagnosis permitting a correct therapeutic management.

### **Cyst of the testis**

Cysts of the testis are usually not palpable and are generally found incidentally during US examination due to other pathologies. They are most often single and rarely multiple. Usually they arise in connection with focal dilation of the seminiferous tubules due to malformation or as a result of an inflammatory episode. US diagnosis of simple cysts is based on the characteristic signs found in cysts located in other organs : anechoic appearance, clear margins and posterior wall

thickening . The rete testis is formed at the confluence of the seminiferous tubules and is located within the mediastinum testis where it extends to the testicular hilum. Obstruction of the ducts connecting the didymus and the epididymis may cause a progressive dilation of the rete testis which is bilateral in one third of patients . The etiology is still not well established, but the highest incidence occurs in patients over 50 years of age and in prostatectomized patients, thereby suggesting that the

These cysts are easily palpable, even if they are small; when they become larger they are painful and sometimes mistaken for tumors. They develop in the tunica albuginea and may be single or multiple; they are believed to arise from the mesothelial cells of the tunica itself. At US examination albuginea cysts appear well-defined; they develop in the virtual space of the vaginal cavity and cause signs of compression of the adjacent testicular parenchyma. They rarely present.

Testicular torsion (TT) is a surgical emergency caused by the twisting of the spermatic cord and its contents. The presentation is acute scrotal pain and early diagnosis is important to salvage the testis. Patients with scrotal pain are often seen by general practitioners and other specialists mainly surgeons and urologists. Acute scrotal pain is also caused by other conditions like torsion of testicular appendages, Epididymo-orchitis (EO), inguinal hernia, hydrocele, trauma, testicular tumours, varicocele. Testicular torsion, epididymo-orchitis, and torsion of the Testicular Appendix (TA) are the three most common causes of 'acute scrotum' in children. The most important aspect that treating doctors should be aware of is time. The need for early treatment of spermatic torsion to avoid testicular infarction is well recognized. Spermatic cord torsion reduces blood supply to the testis, which subsequently leads to haemorrhage, infarction, and necrosis. Many studies have shown that testicular infarction begins within the first 2 hours of spermatic cord torsion onset, irreversible damage occurs after 6 hours, complete infarction develops after 24 hours.

The annual incidence of TT is 3.8% in males aged <18 years. It has a bimodal distribution, with peaks in the perinatal period and in adolescence, which reflects the clinical distinction between extravaginal torsion in new-borns and intravaginal torsion in older children . History and clinical examination are important in diagnosing torsion testis and differentiating from other causes of acute scrotal pain. Short pain duration, nausea or vomiting, high position of the testicle, abnormal ipsilateral cremasteric reflex and scrotal skin changes have been identified, mostly in retrospective studies, as being associated with an increased likelihood of TT. Treating doctors resort to various investigatory test which includes urinalysis and color Doppler ultrasonography. Doppler ultrasonography has a high sensitivity (88.9%) and specificity (98.8%) preoperative diagnostic tool with a 1% false-negative rate [9]. Imaging studies such as MRI is a very accurate tool, providing sensitivity and specificity of 93% and 100%, respectively. However, it is very expensive and time-consuming, which will delay the treatment of TT. As a library, NLM provides access to scientific literature. Inclusion in an NLM database does not imply endorsement of, or agreement with, the contents by NLM or the National Institutes of Health. This is a retrospective study done on all patients who presented with acute scrotal pain from January 2013 to December 2017. The data collected included the patient's age, symptoms, the time duration between the onset, ultrasound, and surgery, ultrasound findings with Doppler and the surgical intervention. Statistical analysis was performed using SPSS 25.0. Data are presented as mean (SD) values. Differences between groups and predictive values were calculated using Chi-square, t-test and Mann-Whitney U-test and are expressed by value with 95% CI. The total number of patients who presented with acute scrotal pain were 88. Testicular torsion was diagnosed in 55 (62.50%) of the patients, 17 (19.32%) had epididymis-orchitis, 5 (5.68%) had torsion of appendage/cyst, and 11 (12.50%) had

normal testis. Ultrasound has a sensitivity and specificity of 88.24% and 68.40% respectively. It is a good tool to detect testicular torsion but it is operator dependent. Positive predictive value was 83.33% and negative predictive value was 76.47%. When ultrasound is combined with clinical findings the rate of negative exploration is reduced by 10%. Good medical history, appropriate clinical evaluation and performing an ultrasound of the scrotum are important in testicular torsion. US evaluation in cases presented after 24 hours does not change the outcome.

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The Ultrasound (US) was performed during office hours by experienced radiologists. The determination of the sonomorphology of the scrotum and epididymis, including echogenicity and echotexture, was done. The echogenicity was then described as, normal echogenicity (homogeneous pattern) and diffuse or focal hyper- or hypoechoogenicity (a heterogeneous and homogeneous pattern). The evaluation included measuring the bilateral testicular size and volume. Finally, central and peripheral perfusion of the testicle with colour Doppler US in comparison with the other side was assessed. Ultrasound diagnosis of TT was made if there was a reduce/absent perfusion or an abnormal echogenicity. Based on these clinical predictions and radiological findings, the eventual prediction was made before the surgical exploration took place. Statistical

analysis was performed using SPSS 25.0. Data are presented as mean (SD) values. Differences between groups and predictive values were calculated using Chi-square, t-test and Mann-Whitney U-test and are expressed by value with 95% CI. p value less than 0.05 were considered statistically significant.

Testicular torsion requires prompt diagnosis and it is a race against time in achieving testicular viability. With each passing hour, the blood flow to the testis diminishes thereby leading to higher chances of orchidectomy. Surgical exploration is done to ensure the definite cause in these patients. However certain conditions presenting as scrotal pain do not require surgical exploration and can be treated medically. For example, epididymo-orchitis closely resembles testicular torsion and is discovered in 19% of the patients who underwent surgical exploration in our study.

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