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TORSION TESTIS: ROLE OF COLOR DOPPLER: A STUDY OF 50 CASES

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ABSTRACT: BACKGROUND: Torsion testis is one of the catastrophic conditions in children and young adults. Traditionally the diagnosis was made clinical presentation and suspicion. Critical decision making is essential to save the testis. **OBJECTIVE:** To study the usefulness and efficacy of Doppler ultrasound in correctly diagnosing acute scrotal conditions in children and young adults to save the testis and to avoid negative explorations. **METHODS:** Over a period of two years 50 patients with acute scrotum were admitted in general surgery department who underwent Doppler ultrasound scrotum and its efficacy in correctly diagnosing the pathology was analysed. **RESULTS:** 50 patients with age group <25 years were included in study. Scrotal pain was the most frequent presenting symptom of acute scrotum (98%) followed by Swelling of the hemiscrotum on the involved side present in 86% of the patients. Doppler ultrasound showed torsion of testis in 18 patients. On Scrotal exploration, torsion of spermatic cord was confirmed in 16 patients, one patient had torsion of appendix of testis and the other had Epididymo-orchitis. Thus the sensitivity and specificity of Doppler ultrasonography for testicular torsion was 86.9% and 92.6% respectively. 2 patients with equivocal Doppler findings, but strong clinical suspicion of testicular torsion were explored, and testis was found to be torsed in both two patients. Doppler ultrasonography showed Epididymo- orchitis in 22 patients, torsion of testicular appendage in 2 patients, Idiopathic scrotal edema in one, and in 5 pts no significant pathology found. All twenty patients of epididymo-orchitis, two patients of torsion of testicular appendage, and one patient of idiopathic scrotal edema were managed conservatively. At three weeks follow up, all the patients were free of symptoms. The sensitivity and specificity of Doppler ultrasonography for epididymo-orchitis was 95% and 100% respectively. **CONCLUSIONS:** color Doppler ultrasound is useful investigation in acute scrotum to confirm or to exclude torsion testis. **KEYWORDS:** Torsion testis, Epididymo-orchitis, Acute scrotal pain, Doppler ultrasound.

INTRODUCTION: Acute scrotum is undoubtedly the most common genitourinary tract emergency of childhood.¹ It is defined as a condition presenting with red, swollen and tender scrotum (unilateral or bilateral) associated with extreme pain.² Common causes of acute scrotum include, torsion testis or its appendages and epididymo-orchitis. Other causes are, testicular trauma, testicular tumors, testicular vasculitis, thrombosis of testicular vein, scrotitis and idiopathic scrotal wall edema.¹ Testicular torsion is the most common cause of acute scrotum in children and young adults accounting for 73% of cases with two separate and distinct ages of maximum incidence, the first year of life and around puberty.³ Even experienced paediatric surgeons and urologists may have sometimes difficulties in differentiating an ischemic from an inflammatory etiology solely on the basis of clinical signs and symptoms. When the diagnosis is

ORIGINAL ARTICLE

prompt and the surgery is timely, testicular salvage is the usual result. More recently, colour Doppler ultrasonography (CDUS) has often been used as an imaging modality for the evaluation of the acute scrotum with the purpose of detecting ischemia, thus reducing the need for explorative surgery.⁴ The role of colour Doppler and power Doppler sonography in the diagnosis of acute testicular torsion is well established.⁵ High frequency transducer ultrasonography using gray scale along with pulsed and colour Doppler is being evaluated as the imaging modality of choice for patients with acute scrotal pain.⁶

METHODS: This study was a prospective study, carried over a period of two years in the Department of general surgery government general hospital Vijayawada from 2012 to 2014. All patients of age group of <25 years with acute scrotum were admitted and subjected to detailed history and physical examination with emphasis on pulse, temperature, general and local examination findings. Baseline investigations involving haemogram, urine routine examination, urine culture with sensitivity and KFT were carried out in all patients. All patients were subjected to immediate Doppler ultrasonography scrotum.

Scrotal Doppler ultrasonography was performed with the patient lying in a supine position and the scrotum supported by a towel placed between the thighs. (Optimal results were obtained with 7 to 14 MHz high-frequency linear-array transducers). The testes were studied in two planes (along the longitudinal and transverse axes). The size and echogenicity of each testicle and the epididymis was compared with that on the opposite side. In patients being evaluated for an acute scrotum, the asymptomatic side was scanned initially to set the gray scale and colour Doppler gains to allow comparison with the affected side. Colour Doppler and pulsed Doppler were optimized to display low-flow velocities, and blood flow in the testis and surrounding scrotal structures was documented, including the Spectral Doppler recording of the intratesticular arterial flow in both testes. The patients were categorized into two groups. Group A comprised the patients who were on the basis of history, physical examination, laboratory investigations and Doppler ultrasonography (suggestive of testicular torsion) needed immediate surgical exploration. Group B comprised the patients who on the basis of history, physical examination, laboratory investigations and Doppler ultrasonography (suggestive of epididymo-orchitis, etc.) were managed conservatively.

In group A, on surgical exploration the findings were recorded and corroborated to Doppler USG findings.

The patients in group B were managed with antibiotics on the basis of culture and sensitivity tests of urine, anti-inflammatory drugs, rest, elevation of scrotum (scrotal support), proteolytic enzymes and follow up at weekly intervals for 1st two weeks and thereafter monthly for at least 3 months for any testicular atrophy. Records of patients not responding to conservative treatment or any complication during the conservative treatment and the intervention done were made. The data is tabulated and was subjected to appropriate Statistical tests.

RESULTS: 50 patients of acute scrotum presented to surgical department who were <25 years, over a period of two years comprising 0.17% among 29200 total patients attended the surgery department.

ORIGINAL ARTICLE

Patients presented with clinical features of pain in scrotum, swelling of hemiscrotum, nausea vomiting, fever, urinary symptoms, abdominal pain and tender scrotum with erythema. Most common presentation was scrotal pain and scrotal swelling 50 patients with age group <25 years were included in study. Scrotal pain was the most frequent presenting symptom of acute scrotum (98%) followed by Swelling of the hemiscrotum on the involved side present in 86% of the patients. Doppler ultrasound showed torsion of testis in 18 patients. On Scrotal exploration, torsion of spermatic cord was confirmed in 16 patients, one patient had torsion of appendix of testis and the other had Epididymo-orchitis. Thus the sensitivity and specificity of Doppler ultrasonography for testicular torsion was 86.9% and 92.6% respectively. 2 patients with equivocal Doppler findings, but strong clinical suspicion of testicular torsion were explored, and testis was found to be tersed in both two patients. Doppler ultrasonography showed Epididymo-orchitis in 22 patients, torsion of testicular appendage in 2 patients, Idiopathic scrotal edema in one, and in 5 pts no significant pathology found. All twenty patients of epididymo-orchitis, two patients of torsion of testicular appendage, and one patient of idiopathic scrotal edema were managed conservatively. At three weeks follow up, all the patients were free of symptoms. The sensitivity and specificity of Doppler ultrasonography for epididymo-orchitis was 95% and 100% respectively.

DISCUSSION: The youngest patient in this study was an infant of 10 months age and the oldest was 24 years. Predominant age group in this study was 10-15 years comprising of 15 patients (30%). Total number of patients with acute scrotum in the age group of 1 day to <25 years visiting the department of Surgery is 1.1/1000 of total patients. Scrotal pain was the most frequent presenting symptom of acute scrotum (98%) followed by Swelling of the hemiscrotum on the involved side present in 88% of the patients. Tenderness of the involved hemiscrotum and testis was the most frequent clinical sign of acute scrotum (94%). Scrotal erythema was present in 39 patients (78%).

These observations are in close agreement with the findings of Cavusoglu YH, et al. and Liu CC.^{7,8} Doppler ultrasound showed torsion of testis in 18 patients. On scrotal exploration, torsion of spermatic cord was confirmed in 16 patients, one patient had torsion of appendix of testis and the other had Epididymo-orchitis. Three patients with equivocal Doppler findings, but strong clinical suspicion of testicular torsion were explored, and testis was found to be tersed in all the two patients. In all these three cases spermatic cord was found to have a partial twist (180°). Thus the sensitivity and specificity of Doppler ultrasonography for testicular torsion was 86.9% and 92.6% respectively. This is in close agreement with the observations of Liu CC et al.,⁸ who reviewed 87 patients in the age group of <25 years of age with presentation of acute scrotum. The sensitivity and specificity of Doppler ultrasound in their study was found to be 87.9%¹ and 93.3% respectively.

Hod et al.⁹ reported 86% sensitivity and 95% specificity of DUS for testicular torsion.

Preoperative Doppler ultrasonography showed Epididymo-orchitis in 22 patients, torsion of testicular appendage in 1 patients, Idiopathic scrotal edema in one, All patients of epididymo-orchitis, two patients of torsion of testicular appendage, and one patient of idiopathic scrotal edema were managed conservatively. The sensitivity and specificity of Doppler ultrasonography for epididymo-orchitis was 95% and 100% respectively.

ORIGINAL ARTICLE

CONCLUSION: Acute testicular pain in children and young adults is a surgical emergency. Color Doppler examination method is very rapid, non-invasive and has a diagnostic accuracy is very good. Proper diagnosis and timely intervention can save testis and avoid unnecessary scrotal exploration. Color Doppler is an excellent modality of investigations which helps in correct diagnosis and timely intervention.

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