Original Research Article

Role of color doppler ultrasonography in acute scrotum

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Abstract

Background: The study aimed to assess the relative importance of color doppler ultrasound (CDUS) in the evaluation of acute scrotal pain. **Method**: A total of 306 patients of acute scrotal pain were selected over a period of one and half year . The patients were scanned with gray scale ultrasound followed by CDUS. Follow up confirmation was done after scrotal exploration or by clinical follow up. **Result**: Majority were diagnosed as epididymo-orchitis 166(54,25%) and torsion 110 (35.95%).CDUS was 100% specific and 95.4% sensitive for epididymo-orchitis and for testicular torsion it was 100% specific and 94.8% sensitive. **Conclusion**: CDUS is an excellent and reliable method for diagnosis of conditions like epididymo-orchitis and testicular torsion.It reduces the number of unnecessary operative procedures.
Key words: Color doppler; Epididymo-orchitis; Torsion.

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INTRODUCTION

Color Doppler ultrasonography (CDUS) is an important tool for diagnosis of scrotal diseases because of its ability to depict anatomy and perfusion in real time.[1] Diagnosis of scrotal diseases has always been a challenge for the clinician due to a non-specific signs and symptoms.[2] Common acute causes are epididymitis, epididymo-orchitis, torsion of testies, torsion of testicular appendage, strangulated hernia and trauma. Incidence of epididymitis is 30% to 35% in patients with acute scrotal pain and 75% of acute intrascrotal inflammatory process.[3,4] The incidence of testicular torsion is 1 in 160 patients, present with acute scrotal pain that is difficult to differentiate from epididymo-orchitis. The onset of symptoms is usually spontaneous but may follow trauma.[5] Other causes of acute scrotal pain include idiopathic scrotal edema, Henoch Schonlein purpura, hydrocele, inguinal hernia are rare.[6] Ultrasound along with color doppler helps in accurate differentiation of surgical versus a nonsurgical cause of acute scrotal pain, as early surgery to torsion of testies helps to salvage testes.[7] For this we want to see the efficacy of CDUS so that surgeon can take early decision.

METHODS

The study included 306 patients in the age range of 13 to 70 years of old, attending the tertiary care centre in rural area of Kerala, with acute scrotal pain. The patients were examined using ultrasound equipment GE Logic Pro 400 with linear color doppler multi frequency (7-9MHz) transducer. Transverse and sagittal images were obtained. Additional oblique and coronal planes were also obtained, with the patient being upright and performing Valsalva Maneuver. The clinical presentation, outcome and CDUS results were analyzed.

RESULTS

We examined 306 patients presenting with acute scrotal pain by CDUS. The results of these imaging studies were correlated with final diagnosis established by surgery or clinical follow up. In our study, out of 306 patients, 110 were diagnosed to be having torsion testies by color doppler but surgical diagnosis revealed 116.The study demonstrated 100 % specificity and 94.8% sensitivity.

Positive and negative predictive value (PPV and NPV) for testicular torsion was found to be 100% and 96.9%.We diagnosed 166 patients as epididymo-orchitis by CDUS. Out of 166 positive diagnosis made by CDUS, eight were found to be false positive on clinical follow up. On clinical follow up of 306 patients,174 patients are found to be having epididymo-orchitis/funiculitis. The study demonstrated 100 % specificity's and 95.4% sensitivity for epididymo-orchitis. PPV and NPV for Epididymo-orchitis was found to be 100% and 94.3% respectively. In our study, we found eighteen case of obstructive inguino-scrotal hernia and combined twelve case of hydrocele and varicocele, diagnosed by ultrasound.

Table 1: Accuracy of CDUS in diagnosis of Testicular Torsion

Torsion	
Positive predictive value	100%
Negative predictive value	96.90
Specificity	100%
Sensitivity	94.80

Table 2: Accuracy of CDUS in diagnosis of epididymo-orchitis

Epididymo-orchitis	
Positive predictive value	100%
Negative predictive value	94.30
Specificity	100%
Sensitivity	95.40

Table 3: CDUS diagnosis in Acute scrotum

Condition	Number of cases	Number of Diagnosed by CDUS
Epididymo-orchitis, epididymitis,funiculitis	174	166
Torsion	116	110
Obstructed/Strangulated hernia	10	18
Hydrocele,varicocele	6	12

DISCUSSION

Acute Scrotum is a common surgical condition. Acute onset scrotal pain, swelling and redness constitute acute scrotum. Physical examination adds only a little information and limited by acute pain and discomfort for patient further limits the proper examination. In these situations ultrasound with color doppler is valuable in differentiating between medically treatable and surgical emergency scrotum avoiding unnecessary surgical exploration.[8] Now CDUS has become the imaging modality of choice for evaluation of acute scrotum. Testicular torsion is one of the most important cause of acute scrotum. Promt diagnosis is necessary because torsion requires immediate surgery to preserve the testies. The greay-scale ultrasound findings of acute and subacute torsion are not specific and may be seen in testicular infarction caused by infections or trauma.[9] CDUS shows absent blood flow in the affected testies[10] or significantly less than in the normal, contralateral testies. The spermatic cord immediately cranial to the testies and epididymis is twisted causing a characteristic "whirlpool pattern" on CDUS.[9,11] Epididymo-orchitis is the most common cause of acute scrotal pain. CDUS usually shows increased blood flow in the epididymis or testies, or both, compared with the asymptomatic side. If infarction occurs, the important distinction from testicular torsion is on spectral doppler. In epididymitis there is high flow and low resistive index in comparison to high resistive flow found in torsion of the spermatic cord .[9,12] Less common diagnosis for acute scrotum include idiopathic scrotal edema, Henoch Schonlein purpura, hydrocele, strangulated inguinal hernia.[6] Therefore, CDUS with its high sensitivity and specificity is the most important investigation in acute scrotum, presenting especially in emergency clinical setting. In our study we have found that CDUS is very efficient tool in investigating acute scrotum and may guide the surgeon to take management decision.

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