

# Ultrasonological Evaluation of Acute Scrotum

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## ABSTRACT

**Introduction:** Acute scrotum is a common surgical condition. Ultrasound along with Doppler plays an important role in differentiating the various causes. Purpose of this study was to evaluate the role of ultrasound in identifying the various causes of acute scrotum.

**Methods:** All patients with history of acute scrotum presenting to the Department of Radiology were included in the study. Scrotal ultrasound was performed with a linear 7.5 to 12-MHz transducer with abundant acoustic gel. Imaging was done in longitudinal and transverse planes with Power Doppler and Color Doppler. The testes, epididymis, spermatic cord, scrotal wall and inguinal region were evaluated. Kidney, Ureter and Bladder region was evaluated for possibility of calculus. Final diagnosis was made based on clinical outcome, follow up, intra-operative findings and histopathology when available. Statistical analysis was done using SPSS version 18 for windows. Descriptive analysis was done. Non parametric correlation between side and torsion was done using Kendall Rank Correlation Coefficient.

**Results:** There were altogether 50 patients available for statistical analysis. Age of the patients ranged from 14 to 65 years with mean age of  $34.7 \pm 14.7$  years. Most common age group was 21 to 40 years. Inflammatory pathology was the most common pathology of actual scrotal pain. There was no significant correlation between side of pain and testicular torsion.

**Conclusion:** Inflammatory pathology was the most common cause for actual scrotal pain. The most common age group was 21 to 40 years.

**Keywords:** Acute scrotum, Epididymoorchitis, Testicular torsion, Varicocele.

## INTRODUCTION

Acute scrotum is a medical emergency, especially in childhood or adolescence. It presents with acute pain with or without swelling. Ultrasound along with Doppler plays an important role in differentiating the various causes. Causes of acute scrotal pain include inflammatory conditions like epididymitis, epididymo-orchitis or abscess, torsion of the testis or its appendage, testicular trauma, and rarely testicular cancer.<sup>1,2,3</sup>

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Ultrasound helps in accurate differentiation of many causes of scrotal pain. It is very important to diagnose surgical versus a nonsurgical cause of acute scrotal pain as early surgery to torsion of spermatic cord helps to salvage testes.<sup>4</sup> Advances in high-resolution gray-scale including tissue harmonic imaging and Color Doppler ultrasound have expanded the use of ultrasound in acute scrotum and have made it a suitable imaging modality for acute scrotum in differentiating the various causes.

Purpose of this study was to evaluate the role of ultrasound in identifying the causes and their prevalence in the patients with acute scrotum presenting to radiology department for ultrasound.

## METHODS

All patients with history of acute scrotum referred to the Department of Radiology at Manipal Teaching Hospital for ultrasound were included in the study. After reviewing the requisition and obtaining informed consent ultrasound scan was performed. Scrotal ultrasound was performed with a linear 7.5 to 12-MHz transducer with abundant acoustic gel. Imaging was done in longitudinal and transverse planes with Power Doppler and Color Doppler. The testes, epididymis, spermatic cord, scrotal wall and inguinal region were evaluated. Additional techniques such as the Valsalva maneuver or upright positioning were used for evaluating varicocele. After completing the scrotal examination, Kidney, Ureter and Bladder (KUB) region was evaluated using low frequency transducer. Color Doppler was used when required. Ultrasound was performed using GE logique P3 machine by a radiologist with 7 years' experience. Final diagnosis was made based on clinical outcome, follow up, intraoperative findings and histopathology when available. Those patients with history of scrotal trauma, not giving consent and those lost on follow up were excluded from the study. Prior approval from the institutional review committee was done. Informed consent was taken. Statistical analysis was done using SPSS version 18. Descriptive analysis was done. Non parametric correlation between side and torsion was done using Kendall Rank Correlation Coefficient.

## RESULTS

A total of 57 patients with acute scrotum were referred to the Department of Radiology for ultrasound examination between January 2014 and December 2014. Five patients with history of trauma were excluded from the study. Two patients were lost during follow up; hence they were also excluded from the study. Remaining 50 patients were included for statistical analysis. Age of the patients

ranged from 14 to 65 years with mean age of  $34.7 \pm 14.7$  years. Most of the patients were in the age group 21 to 40 years (Figure 1). Pain on left side of scrotum was seen in half of the patients (Table 1). Inflammatory pathology was the commonest etiology of acute scrotal pain accounting for 56% of patients. Varicocele was the second most common diagnosis. Testicular torsion accounted for only 6% of all cases of acute scrotum (Table 2). There was no significant correlation between side and testicular torsion with  $R = 0.1$  and  $P = 0.3$ . We had observed maximum number of cases of testicular torsion in less than 20 years age group and inflammatory pathology in 41 to 50 years age group. Varicocele was most common among 31 to 40 years age group. (Table 3)

**Table 1: Side of pain**

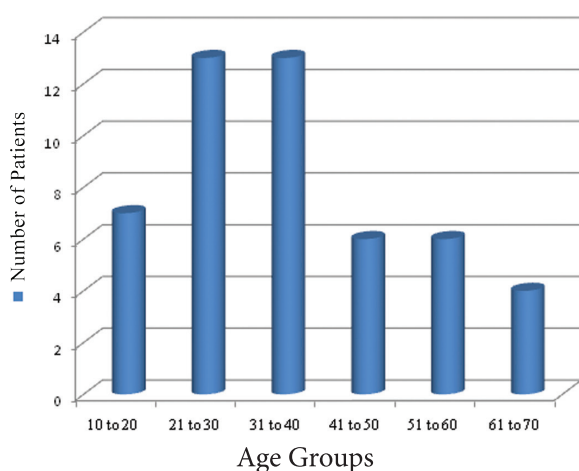
Side	Frequency	Percentage
Bilateral	3	6
Left	25	50
Right	22	44
<b>Total</b>	<b>50</b>	<b>100</b>

**Table 2: Etiology of acute scrotum**

Diagnosis	Frequency	Percentage
Calculus	5	10
Epididymal cyst	1	2
Hernia	1	2
Inflammatory pathology	28	56
Normal	5	10
Testicular torsion	3	6
Testicular tumor	1	2
Varicocele	6	12
<b>Total</b>	<b>50</b>	<b>100</b>

## DISCUSSION

Acute scrotum is a common surgical condition. Acute onset scrotal pain, swelling and redness constitute acute scrotum. There are many causes for acute scrotum but testicular torsion is one of the most important causes of acute scrotum. Testes cannot withstand ischemia for more than a short duration and a delay in the diagnosis of testicular torsion may lead to permanent loss of testis along with its function.



**Figure 1:** Distribution of patients according to age group.

We had lesser number of children in our study. Cavusoglu YH et al have evaluated only children in their study.<sup>5</sup> About half of our cases of acute scrotum were seen in left side. Khaleghnejad-Tabari A et al. have also observed the similar finding.<sup>6</sup>

6% of all cases of acute scrotum and this could be due to the lesser representation of children in our study. Cavusoglu YH et al and Mushtaq I et al have observed a higher rates of testicular torsion in 29% and 20%, respectively.<sup>5,7</sup> Testicular torsion is most commonly seen in neonates and in adolescents but it can occur at any age.<sup>8,9</sup> We had observed maximum number of cases of testicular torsion in less than 20 years age group.

There was no significant correlation between side and testicular torsion.

Torsion of the testicular appendages accounts for 24% to 46% of acute scrotal presentations, and it presents similarly to torsion of the testis. It often presents in 7- to 13-year-old children.<sup>1</sup> But there were no cases of torsion of testicular appendages in our study which again could be due to lesser number of children in our study.

Epididymo-orchitis is the most common cause of acute scrotum in post pubertal men. The age of peak incidence is 40–50 years.<sup>8</sup> We also observed that inflammatory pathology was most common among 41 to 50 years age group. In our study, inflammatory pathology was the commonest cause for actual scrotal pain accounting for 56% of cases of acute scrotum. Epididymo-orchitis was also found to be the leading cause of acute scrotum in studies conducted by other authors.<sup>5,10</sup>

Pain in the testis or scrotum could also be

**Table 3: Etiology with age group**

Age group	Calculus	Epididymal cyst	Hernia	Inflammatory	Normal	Testicular Torsion	Tumour	varicocele
10-20	0	0	0	5	0	2	0	0
21-30	3	0	1	5	2	1	0	1
31-40	2	1	0	6	1	0	1	3
41-50	0	0	0	5	0	0	0	1
51-60	0	0	0	4	1	0	0	1
61-70	0	0	0	3	1	0	0	0

The reported incidence of testicular torsion is around one per 4000 young males per year, it accounts for 25% cases of acute scrotum.<sup>2</sup> In our study testicular torsion accounted for only

referred from visceral or somatic structures. The pain may radiate to the testes because of referred pain via the genitofemoral nerve.

Stone or other pathology causing upper ureteral distension may cause referred pain to the testis whereas lower ureteral distension may cause ipsilateral scrotal pain.<sup>11</sup> In our study, Calculus accounted for 10% of the cases of acute scrotum and those were the cases of calculus in the ureter and vesicoureteric junction.

The swellings of varicoceles are usually painless but exceptionally large ones can ache after exercise or after prolonged standing.<sup>12</sup> In our study, varicocele was found to be the second most common cause for acute scrotum.

The less common diagnoses for acute scrotum include testicular infarction, strangulated hernia, testicular tumor, and idiopathic scrotal edema.<sup>13</sup> The other less common causes of acute scrotum in our case were epididymal cyst, strangulated hernia and testicular tumor.

## CONCLUSION

Inflammatory pathology was the commonest cause for actual scrotal pain, followed by varicocele. The most common age group for testicular torsion was 21 to 40 years and for epididymo-orchitis was 41 to 50 years. However, a longer study including larger number of patients would give a true picture of the problem.

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