

Inflammation and infection

## Acute idiopathic scrotal edema in the adult: A case report

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### ABSTRACT

Acute idiopathic scrotal edema (AISE) is a self-limiting disease of uncertain etiology, more common in children. It is characterized by the rapid onset and progression of edema and erythema of the scrotal skin and dartos. Although AISE does not involve the underlying testis and paratesticular structures, on initial presentation it is challenging to differentiate from other causes of acute scrotum. It is a difficult but important diagnosis, as correct identification avoids unnecessary surgical scrotal exploration. We discuss a case of AISE in a 23-year-old patient, and highlight the clinical and sonographic features which, in retrospect, were indicative of the diagnosis.

### Introduction

Mr K is a 23-year-old patient who presented to our hospital with acute onset of bilateral scrotal swelling. We describe how clinical findings and investigations led to our diagnosis of AISE, and reflect on our approach to the acute scrotum particularly when a decision on potential surgical intervention has to be promptly made.

### Case presentation

In September 2018, Mr K, a previously healthy 23-year-old gentleman presented to the Emergency Department at 5.30am with bilateral scrotal swelling, which started 3 hours ago and had woken him up from sleep. The swelling had progressed rapidly, causing Mr K significant distress. He denied prior trauma to the testes and there was no pain, fever, or urinary symptoms.

Examination by the Urologist-on-call revealed an inflamed-looking scrotum. There was generalized scrotal swelling, with thickened, warm and erythematous scrotal skin. Both testes were palpable, of normal lie and non-tender.

Laboratory tests were unremarkable apart from leukocytosis (TWC  $17 \times 10^9/L$ ). Urinalysis was unremarkable.

The Urologist's impression was that Mr K's presentation was unconvincing for testicular torsion and did not warrant emergent surgical exploration. As the diagnosis was uncertain and 3 hours had elapsed since the onset of his symptoms, the decision was made for urgent ultrasonography.

Ultrasonography was performed, which revealed bilateral scrotal wall thickening, subcutaneous edema, and hypervascularity on Doppler

ultrasound. Importantly, there was homogeneity of testicular parenchyma and equal arterial supply to both testes (Fig. 1).

Mr K was managed conservatively. He was started on empirical oral antibiotics and non-steroidal anti-inflammatory drugs. Within 48 hours of admission the scrotal edema had almost completely resolved (Fig. 2) and he was discharged. He was seen in the outpatient clinic 2 months later, and was completely well with normal genitalia on examination.

### Discussion

The acute scrotum is a diagnostic conundrum, both in the pediatric and adult setting. Differential diagnoses include epididymitis, testicular torsion, torsion of the testicular/epididymal appendages, hydrocele and inguinoscrotal hernia.

AISE, often a diagnosis of exclusion, was first described by Qvist in 1959.<sup>1</sup> It is characterized by marked edema of the skin and dartos fascia, without involving the deeper layers, testes, or epididymis. AISE can be uni- or bilateral. Erythema of the perineum and inguinal region is seen in 50% of cases.<sup>2</sup>

The etiology of AISE is uncertain. It is postulated that AISE is a hypersensitivity reaction as eosinophilia is found in more than 40% of cases, and patients suffer from conditions like asthma and eczema.<sup>3</sup> An infective etiology has been proposed by Nicholas et al. - 13% of studied patients tested positive for beta-hemolytic *Streptococci* in their scrotal fluid culture. Recent reports have suggested that acute Epstein-Barr virus infection can precipitate AISE, although more information is required to validate this.

Scrotal edema is often the first clinical manifestation. It develops acutely, progresses rapidly and may be accompanied by intense scrotal

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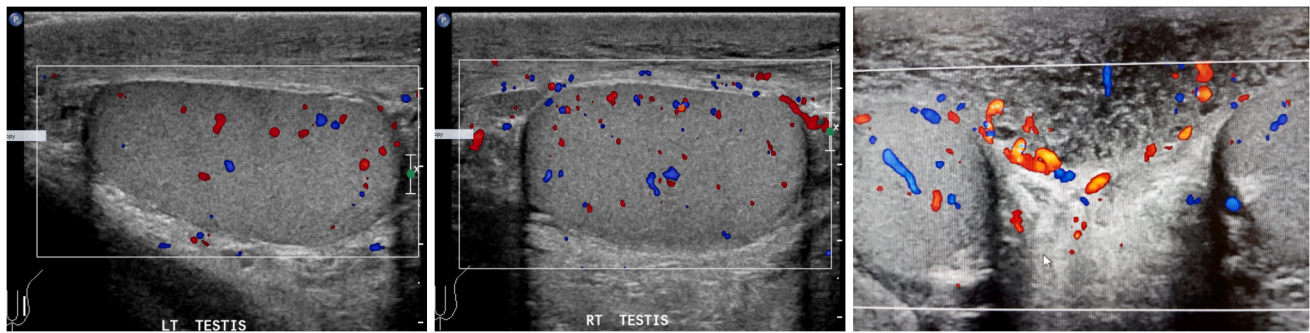


Fig. 1. Normal testicular parenchyma bilaterally with symmetrical vascular flow on color Doppler. There is thickening and hypervascularity of the scrotal wall.



Fig. 2. Complete resolution of scrotal edema and erythema within 48H of admission.

pruritus. Erythema of the affected area is common. The groin, perineum, penis, or suprapubic region may be involved. Pain may occur from acute stretching of the scrotal skin from edema, but is often not debilitating. Symptoms characteristically last for up to 72 hours. Subsequently,

Table 1

Differentials	US/Doppler Findings	Remarks
AISE	<ul style="list-style-type: none"> <li>Thickening/hypervascularity of scrotal wall</li> <li>Normal appearance/vascularity of testes</li> </ul>	
Testicular torsion	<ul style="list-style-type: none"> <li>Decreased arterial flow to testes</li> </ul>	
Epididymoorchitis	<ul style="list-style-type: none"> <li>Increased arterial flow to testes and/or epididymis</li> </ul>	
Scrotal cellulitis	<ul style="list-style-type: none"> <li>Edema/thickening of scrotal wall</li> </ul>	<ul style="list-style-type: none"> <li>May progress to Fournier's gangrene (esp if diabetic/immunosuppressed/obese)</li> </ul>
Systemic edema	<ul style="list-style-type: none"> <li>Normal</li> </ul>	<ul style="list-style-type: none"> <li>Look for underlying cause (cardiac/renal/hepatic failure)</li> </ul>

edema and erythema begin to recede, with complete resolution within 48 hours. Relapse occurs in up to 21% of cases, sometimes months to years after the initial event.<sup>4</sup>

It may be challenging to reach a conclusive diagnosis based on initial examination findings as the scrotum is globally inflamed. Ultrasonography is therefore a helpful adjunct, and in fact the imaging modality of choice to investigate the acute scrotum. Table 1 is a summary of differentials and key ultrasound findings for the acute scrotum. Edema, thickening and hypervascularity of the scrotal wall, with normal appearance and vascularity of the testes, are considered specific for AISE,<sup>5</sup> which was the case for our patient.

The "Fountain Sign", described by Geiger, is a finding on color Doppler interrogation highly suggestive of AISE. It is due to marked hypervascularity in the scrotal wall, which derives arterial supply from branches of the deep external and internal pudendal arteries. This finding was present in Mr K's ultrasonography, convincing our team of the diagnosis of AISE.

Other imaging modalities include Computed Tomography and Magnetic Resonance Imaging, though rarely done due to radiation exposure, and the demonstrated utility of ultrasonography. CT and MRI can be considered if a pelvic cause of scrotal edema is to be ruled out.

Management of AISE is conservative – barring contraindications, non-steroidal-anti-inflammatory drugs (NSAIDs) are recommended to relieve inflammation and pain. Empirical oral antibiotics minimize superimposed infection, but efficacy is not clearly proven. Symptoms usually resolve rapidly and completely within 5 days. Patients do not require long-term follow up but should be aware of the possibility of relapse.

**Conclusion**

AISE is uncommon but an important cause of acute scrotum. Physical examination and ultrasonography (especially with Fountain's sign) is

diagnostic. Correct diagnosis is crucial as it prevents unnecessary surgical exploration and its associated risks. While common in younger boys it can occur in the older population as we have demonstrated. In the evaluation of acute scrotal swelling AISE should remain in the list of key differentials.

## References

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