

## Unusual presentation of more common disease/injury

## A novel false-positive cause in testis scintigraphy in the diagnosis of testis torsion

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**Summary**

Testis scintigraphy is the most reliable modality in the diagnosis of testis torsion since it directly reflects the vascularity of the testis. The 'rim sign' is considered as the pathognomonic sign of the missed torsion. However, there are some possible false-positive cases. In this case report, we would like to present an unexpected false-positive cause of the 'rim sign' in testis scintigraphy in an 18-year-old male patient.

**BACKGROUND**

Testicular torsion is one of the most important pathologies in differential diagnosis acute scrotal pathologies.<sup>1</sup> Testicular torsion leads to ischaemia usually in 1 h and the function of the organ is lost within 24 h, immediate therapeutic intervention is strictly necessary.<sup>2</sup> Testis scintigraphy can accurately discriminate testis torsion and epididymitis which is another cause of acute scrotum.<sup>3</sup> There are not many causes of false positivity in the diagnosis of testis torsion in testis scintigraphy. Our case is a novel case of false-positive cause of testis torsion on scintigraphy in which follow-up testis scintigraphy documented the improvement of testicular tissue after the surgical intervention.

**CASE PRESENTATION**

An 18-year-old male patient who presented with acute scrotal pain lasting for 1 week was admitted to our hospital. The patient's history was not specific except for left varicocelelectomy 1 year ago. Physical examination revealed tender and slightly enlarged left testis and no other sign. Colour Doppler ultrasonographic examination revealed the enlargement of left testicle and heterogeneity of parenchyma echo with a little fluid collection in the left scrotum. Ultrasonography revealed no arterial blood supply to the left testis, thus the prediagnosis was left testicular torsion. Dynamic testis scintigraphy by administration of 15 mCi intravenous Tc-99m pertechnetate was performed by the gamma camera equipped with a parallel collimator (figure 1A) and additional late-phase imaging was performed by parallel and pin hole collimator (figure 1B,C). The scintigraphy revealed the 'rim sign' which refers to the absent perfusion of the left testicle with preserved perfusion of the surrounding scrotal tissues. This imaging pattern was consistent with a missed torsion case showing the infarct of the tissue. Immediate surgical exploration was performed; however, there was no testicular torsion. Scrotal incision was extended to the inguinal region where towards the previous incision. The scar

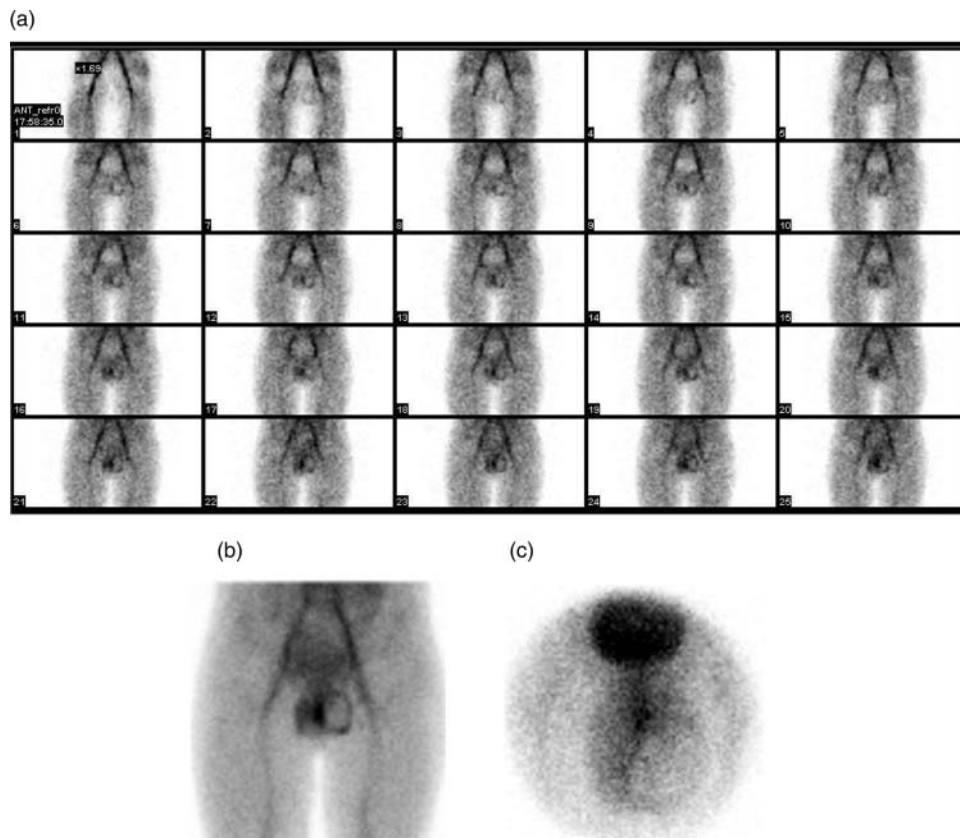
tissue remained from the previous varicocelelectomy procedure was removed. Careful dissection was performed and vas deference and spermatic cord was identified. Spermatic arteries and veins were identified as a separate package which was adhered beneath the fascia and a dense fibrotic band was observed over the cord. Vas deference was observed to be dissected previously. There was no sign of torsion but dense fibrotic bands as well as strict attachment of spermatic arteries to the fascia and underlying tissue due to the previous surgery was identified. Spermatic arteries and veins were freed from the surrounding tissues and vascular supply of the left testicle was restored. Control scintigraphy after 3 months showed complete improvement of perfusion in the left testis (figure 2A–C).

**OUTCOME AND FOLLOW-UP**

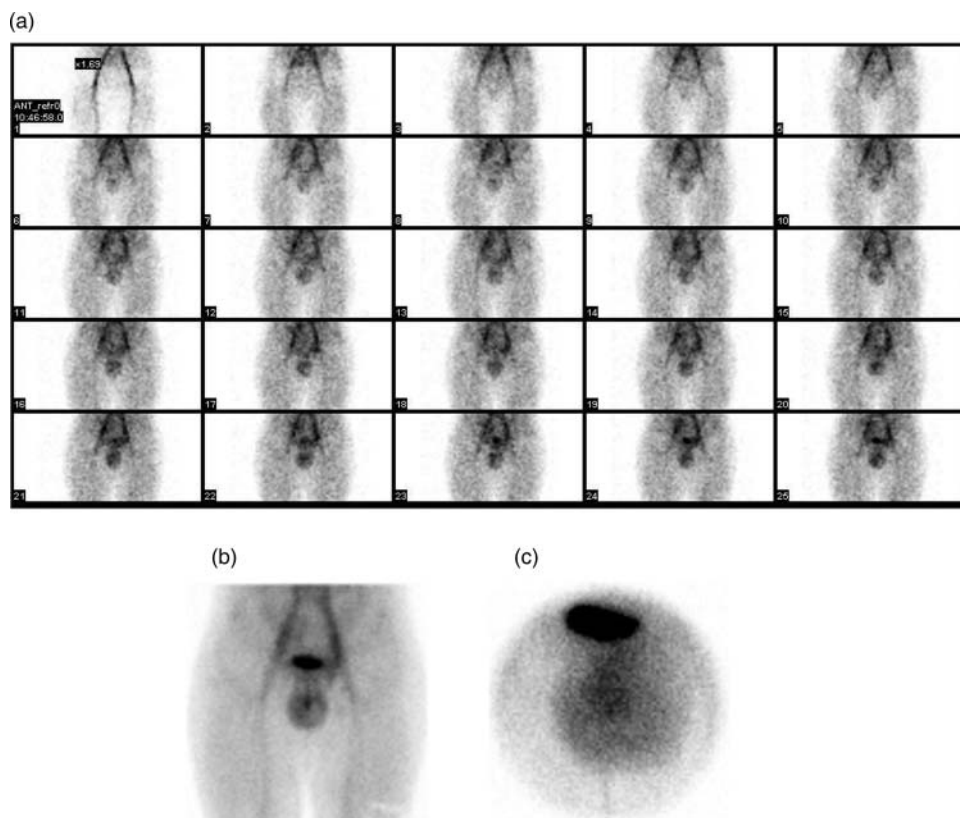
The blood supply of the left testis was restored by the surgical intervention.

**DISCUSSION**

The diagnosis of testis torsion primarily depends on physical examination; however, specificity of physical examination and role in differential diagnosis is relatively poor. Epididymitis is one of the important pathologies in differential diagnosis and there's usually pyuria during epididymitis. Nausea and vomiting are more frequent in testis torsion due to a reflex stimulation.<sup>3</sup> A history of precipitating event may favour the diagnosis of testicular torsion rather than other acute scrotum aetiologies.<sup>4</sup> Testis scintigraphy has been reported to have an approximately 100% sensitivity in detecting testis torsion.<sup>5</sup> Moreover, specificity of testis scintigraphy for diagnosis was shown to be higher within the first 12 h.<sup>6</sup> Colour Doppler ultrasonography is another important modality in differential diagnosis of testis torsion. Anatomic information provided by ultrasonography is essential to discriminate other accompanying factors such as hydrocele, tumour, etc. In addition, ultrasonography can reveal information regarding



**Figure 1** (A) Dynamic phase of testis scintigraphy in anterior projection. (B) Late-phase anterior projection parallel hole static image. (C) Late-phase anterior projection pin hole static image.



**Figure 2** (A) Dynamic phase of testis scintigraphy in anterior projection in follow-up. (B) Late-phase anterior projection parallel hole static image in follow-up. (C) Late-phase anterior projection pin hole static image in follow-up.

the vascularity of the testis which is important in decision-making of surgical management. Comparative studies with ultrasonography and scintigraphy have concluded that a combined evaluation of information obtained from two modalities reveal the best results.<sup>5-7</sup> MRI has been introduced as another alternative imaging modality in patients with inconclusive ultrasonography results.<sup>8</sup>

Although testis scintigraphy is an effective method, the unavailability of scintigraphy in every centre and absence of the nuclear medicine staff for 24 h results in the predilection of ultrasonography as a sole method in diagnosis. However, ultrasonography can miss testicular torsion in incomplete cases and in the presence of small testis. Thus, the sensitivity of the scintigraphy is higher than ultrasonography.<sup>9</sup> Although the sensitivity of scintigraphy is high, the specificity of the method can be influenced by some false positives. It is recommended that combination of the scintigraphic and ultrasonography in diagnosis may decrease false-positive results. In our case, ultrasonography was also consistent with torsion however, insufficient blood supply was due to entrapment of spermatic vessels rather than testicular torsion and previous surgery was the cause. This aetiology is not a usual one in insufficient or absent blood supply to the testis and it was not expected. Thus, we believe that this aetiology can be listed in the false-positive causes of testis torsion in testis scintigraphy. Our case also demonstrated that improvement of the flow to the testis postoperatively led to better perfusion of testis which was demonstrated by scintigraphy. Such an improvement was also shown in another study, previously.<sup>10</sup>

The 'rim sign' which is attributed to the testicular torsion can be demonstrated during a blockage of the blood supply due to a previous surgical intervention as appeared in our case. In the present study, preoperative and postoperative testicular scintigraphy revealed insufficient or absent blood supply to the testis and subsequent surgical restoration of arterial flow to the affected testis, respectively.

### Learning points

- ▶ Testis torsion can be accurately diagnosed by testis scintigraphy.
- ▶ Although the 'rim sign' usually refers to the miss torsion sometimes can be a result of insufficient or absent blood supply due to previous surgery.
- ▶ Testis scintigraphy may show improvement of testicular blood supply in the follow-up period.

**Competing interests** None.

**Patient consent** Obtained.

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