

False-positive halo sign on testicular scintigraphy in a 2-year-old boy with epididymo-orchitis

Mehdi Rajaeipour¹, Nasrin Mohammadi Aref², Nima Bakhtiari³

¹Urology Department Faculty of Medicine Dezful University of Medical Science, Dezful, Iran

²Student Research Committee, Islamic Azad University, Tehran Medical Branch, Tehran, Iran

³Pain Research Center Imam Khomeini Hospital Ahvaz Jundishapur University Of Medical Science, Ahvaz, Iran

[Received 4 VI 2019; Accepted 27 VI 2019]

Abstract

We reported a case of 2-year-old child where epididymo-orchitis was misdiagnosed as testicular torsion on scrotal scintigraphy. The scan showed that left hemiscrotum demonstrated a rim of increased activity with a photopenic center in the left testis (halo sign). At surgery, epididymo-orchitis was detected and there was no testicular torsion.

KEY words: testicular scintigraphy, torsion, 99mTc pertechnetate

Nucl Med Rev 2019; 22, 2: 94–95

Introduction

99mTc pertechnetate scintigraphy is routinely used to detect testicular torsion and differentiate this condition from acute epididymo-orchitis. However, differentiation of torsion from hydrocele and testicular or scrotal abscess may be difficult [1]. In this report, we present a 2-year-old child in whom epididymo-orchitis was misdiagnosed as testicular torsion on scrotal scintigraphy.

Case report

A 2-year-old boy presented to the urology clinic with a complaint of left hemiscrotal swelling, edema and local tenderness for 2 days. There was no history of fever, vomiting, agitation, inconsolable cry and poor feeding. On physical examination, right testis was normal; local tenderness and edema of left testis was obvious. Left testis was floating in the scrotal sac and epididymis was palpable. Cremasteric reflex was positive. In complete blood count (CBC) test results, white blood cell count was 17.9 ($10^3/\mu\text{L}$).

Doppler ultrasound (US) imaging showed left testicle was $13 \times 10 \times 8$ mm and had a coarse echotexture and left epididymis was enlarged and reactive hyperemia was seen in it and left para testicular region. The impression of US was 360 degree left testicular torsion.

Scrotal scintigraphy was then performed in anterior dynamic views immediately after intravenous injection of 7 mCi of 99mTc

pertechnetate up to 20 minutes post radio-tracer injection. Images showed that left hemiscrotum demonstrated a rim of increased activity with a photopenic center in the left testis (bull's-eye sign) and normal tracer uptake in the right hemi-scrotum (Fig. 1) the impression of scrotal scintigraphy was missed torsion of left testis.

A scintigraphic diagnosis of mid-phase testicular torsion of the left testis was made and the patient was immediately operated. However, it was discovered intraoperatively that the patient had epididymo-orchitis and not torsion of the left testis (Fig. 2).

Discussion

Acute epididymo-orchitis (the inflammation of one or both testes and epididymis) is a common urological diagnosis encountered by urologists and by emergency and primary care physicians. It should be differentiated from testicular torsion — a true urological emergency. Furthermore, acute epididymitis can be complicated by testicular abscesses or by testicular infarction, due to spermatic cord swelling and by the impairment of blood flow — conditions that should be easily recognized and properly treated [2].

The diagnosis of epididymo-orchitis is usually established based on clinical symptoms and physical examination, but also further examinations could be helpful in confirming the epididymo-orchitis diagnosis and in identifying complications. Differentiation between epididymo-orchitis and testicular torsion can sometimes be difficult. However, a referral to the urologist when testicular torsion is suspected should not be delayed by an ultrasonographic (US) examination [2].

Rapid diagnosis of testicular torsion is critical to preserve fertility. Imaging studies such as Doppler ultrasonography, and technetium 99mTc scrotal scintigraphy can be of use in the rapid diagnosis of testicular torsion [3–5].

Correspondence to: Nasrin Mohammadi Aref
Student Research Committee, Islamic Azad University,
Tehran medical branch, Tehran, Iran;
tel: +989126848496, e-mail: nasrinaref12@gmail.com



Figure 1. At surgery, epididymo-orchitis was detected and there was no testicular torsion

Differentiation by scintigraphy between acute torsion, hydrocele, testicular or scrotal abscess, or even inguinal hernia can be difficult, and images must be interpreted in conjunction with clinical findings from scrotal transillumination. In this situation, sonography can provide useful complementary information [6–9]. Santosh et al. presented a 5-year-old child in whom epididymitis with hydrocele was misdiagnosed as testicular torsion on scrotal scintigraphy [1]. In a previous study comparing scintigraphy and US in children with scrotal pain, Doppler US was able to provide the diagnosis of epididymo-orchitis in cases of false-positive scintigraphy [6]. A peri-testicular hyperemic rim on radionuclide scrotal scintigraphy is not pathognomonic of missed testicular torsion [10]. Epididymitis and hydrocele have also been reported to mimic testicular torsion on scintigraphy in adults [4, 11, 12]. The present study describes a halo sign appearance on scrotal scintigraphy caused by epididymo-orchitis in a clinical setting, suggestive of testicular torsion in a child.

References

- Santhosh S, Guha P, Bhattacharya A, et al. False-positive "halo" sign on testicular scintigraphy in a 5-year-old boy with epididymitis and hydrocele. *Indian J Nucl Med.* 2011; 26(3): 159–160, doi: [10.4103/0972-3919.104002](https://doi.org/10.4103/0972-3919.104002), indexed in Pubmed: [23326071](https://pubmed.ncbi.nlm.nih.gov/23326071/).
- Suciu M, Serban O, Iacob G, et al. Severe Acute Epididymo-Orchitis Complicated with Abscess and Testicular Necrosis—Case Report. *Ultrasound Int Open.* 2017; 3(1): E45–E47, doi: [10.1055/s-0042-122149](https://doi.org/10.1055/s-0042-122149).
- Wu HC, Sun SS, Kao A, et al. Comparison of Radionuclide Imaging and Ultrasonography in the Differentiation of Acute Testicular Torsion and Inflammatory Testicular Disease. *Clinical Nuclear Medicine.* 2002; 27(7): 490–493, doi: [10.1097/00003072-200207000-00005](https://doi.org/10.1097/00003072-200207000-00005).

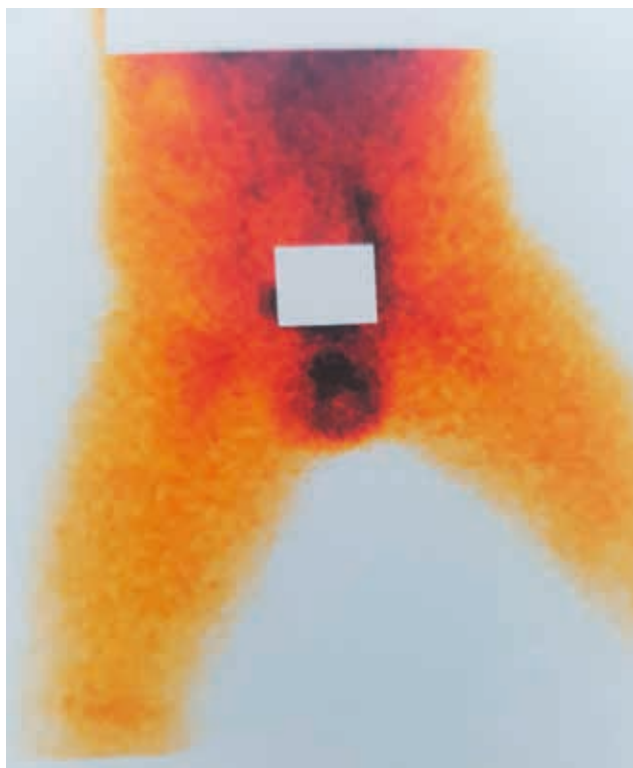


Figure 2. Scrotal scintigraphy was then performed in anterior dynamic views immediately after intravenous injection of 7 mCi of ^{99m}Tc pertechnetate up to 20 minutes post radio-tracer injection. Images showed left hemiscrotum demonstrates a rim of increased activity with a photopenic center in the left testis (arrows) and normal tracer uptake in the right hemiscrotum

- Erbay N, Brown S, Spencer R. Hydrocele Mimicking Testicular Torsion on Radionuclide and Ultrasound Studies. *CLINICAL NUCLEAR MEDICINE.* 1997; 22(8): 570–571, doi: [10.1097/00003072-199708000-00020](https://doi.org/10.1097/00003072-199708000-00020).
- Derebek E, Akgür FM, Kut O, et al. Ipsilateral Thigh Hyperperfusion During Acute Testicular Torsion. *Clinical Nuclear Medicine.* 1995; 20(6): 554–556, doi: [10.1097/00003072-199506000-00023](https://doi.org/10.1097/00003072-199506000-00023).
- Blasko ARN, Bulas D, Shalaby-Rana E, et al. Color Doppler sonography and scintigraphy of the testis: a prospective, comparative analysis in children with acute scrotal pain. *Pediatr Emerg Care.* 2002; 18(2): 67–71, indexed in Pubmed: [11973493](https://pubmed.ncbi.nlm.nih.gov/11973493/).
- Karadeniz T, Topsakal M, Ariman A, et al. Prospective comparison of colour doppler ultrasonography and testicular scintigraphy in acute scrotum. *International Urology and Nephrology.* 1996; 28(4): 543–548, doi: [10.1007/bf02550964](https://doi.org/10.1007/bf02550964).
- Yuan Z, Luo Q, Chen L, et al. Clinical study of scrotum scintigraphy in 49 patients with acute scrotal pain: A comparison with ultrasonography. *Annals of Nuclear Medicine.* 2001; 15(3): 225–229, doi: [10.1007/bf02987836](https://doi.org/10.1007/bf02987836).
- Paltiel HJ, Connolly LP, Atala A, et al. Acute scrotal symptoms in boys with an indeterminate clinical presentation: comparison of color Doppler sonography and scintigraphy. *Radiology.* 1998; 207(1): 223–231, doi: [10.1148/radiology.207.1.9530319](https://doi.org/10.1148/radiology.207.1.9530319), indexed in Pubmed: [9530319](https://pubmed.ncbi.nlm.nih.gov/9530319/).
- Vieras F, Kuhn CR. Nonspecificity of the "rim sign" in the scintigraphic diagnosis of missed testicular torsion. *Radiology.* 1983; 146(2): 519–522, doi: [10.1148/radiology.146.2.6294739](https://doi.org/10.1148/radiology.146.2.6294739), indexed in Pubmed: [6294739](https://pubmed.ncbi.nlm.nih.gov/6294739/).
- Palestro C, Finn C. Hydrocele and Epididymitis Mimicking Testicular Torsion on Scrotal Scintigraphy. *Clinical Nuclear Medicine.* 1993; 18(10): 910–911, doi: [10.1097/00003072-199310000-00021](https://doi.org/10.1097/00003072-199310000-00021).
- Rosenson A, Ali A, Fordham E, et al. A False-Positive Scan for Testicular Torsion and False-Negative Scan for Epididymitis. *Clinical Nuclear Medicine.* 1990; 15(12): 863–864, doi: [10.1097/00003072-199012000-00001](https://doi.org/10.1097/00003072-199012000-00001).