Scrotal Scintigraphy in a Case of Acute Scrotum

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Introduction

Testicular torsion is considered in any patient who complains of acute scrotal pain and swelling. The delay in diagnosis of acute scrotum leads to loss of testicular function in a case of torsion, prompting some urologists to recommend operative exploration in all cases [1]. This exposes a large number of patients to unnecessary surgery and its attendant risks. In 1973 Nadel [2], introduced scrotal scintigraphy as a means of differentiation of non perfused testicle of acute torsion from the hyperemic tissues seen in epididymo-orchitis.

Case Report

A 28 year old patient presented with acute right scrotum of few hours duration. On examination he had a swollen and tender right sided spermatic cord and testis (Prehns' sign present, Cremasteric reflex present, lie of testis – vertical and scrotal skin- normal). He was exhibited conservative management as a case of acute epididymo-orchitis.

Special investigation like colour doppler flow imaging (CDFI) of testes revealed right testicle- 4 x 3.3 x 3 cm, left testicle – 3.1 x 2.1 x 2.4 cm, right epididymis – 16.4 x 3 mm, left epididymis – 7.4 x 1.5 mm, normal echotexture of both testes, minimal hydrocoele right, arterial and venous spectral tracings appeared normal, with an increased vascularity of right epididymis. On the next morning, the patient had acute pain in the right testis with negative Prehns' sign. An urgent CDFI revealed mildly reduced flow and echotexture of the right testes as compared to the left, however torsion could not be excluded. Complete blood count revealed neutrophilic leucocytosis (27100/cmm, polymorphs 88%) with toxic granules.

An urgent scrotal scintigraphy done revealed an early right hemiscrotal and spermatic cord vascularity in the dynamic images with increased radiotracer activity in the lateral aspect of the right testes with a gradual build up of radioactivity in the region of the right hemiscrotum. There was no evidence of Rim sign. Right testis was larger in size than the left. The findings were suggestive of Epididymo-

orchitis (Right) /detorsion (spontaneous) testes right. (Fig. 1). The patient improved with conservative management and had an uneventful recovery in the next five days.

Discussion

The yearly incidence of testicular torsion is estimated at 1:4000 males younger than 25 years [3]. There are two distinct peaks of incidence in newborns and in teenagers (between 12-16 years) [4]. In comparison, inflammatory scrotal disorders are more common than torsion [5]. Neonatal testicular torsion is thought to occur as a result of general laxity of the gubernacular attachment of the testis to the scrotal floor [6]. Changes in tissue and testicular function are closely related to the duration of torsion. Several studies suggests that testicular salvage rate are approximately 80% if operated within six hours of the onset of pain and about 20% if operated around ten hours. Salvage is negligible in those operated after 24 hours [1,4,6].

Epididymo-orchitis is seen in young adults most commonly between 19 to 35 years of age, although it is not unusual to encounter infants, adolescents, and older men presenting with this malady [7].

The clinical indication for scrotal scintigraphy is differentiation of specific causes of acute and subacute scrotal pain, especially testicular torsion and epididymitis/orchitis. The procedure is not indicated in evaluating cryptorchidism, tumours, or chronic inflammation.

In scrotal scintigraphy, technetium-99m sodium pertechnetate is the commonly used radiopharmaceutical agent. The other acceptable agent is technetium-99m (stannous) diethylenetriamine pentaacetic acid (DTPA). The usual adult dose is 15-25 millicuries (555-940 MBq), given intravenously.

A practical way of analysing the scrotal scintigram is to divide the images into three phases; spermatic cord flow in the early dynamic phase, hemiscrotal flow in the

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Fig. 1 : Scrotal scintigraphy: Increased tracer concentration suggestive of increased vascularity along the spermatic cord and in the right hemiscrotum in the early dynamic images with gradual build up of tracer concentration seen in the region of the right hemiscrotum in the sequential tissue phase.

late dynamic flow phase, and hemiscrotal static activity from the sequential tissue phase images. Blood flow is graded increased, decreased or equal with respect to blood flow on the asymptomatic side.

In early torsion, flow images may show no significant asymmetry in the spermatic cord phase or in the later hemiscrotal phase. Occasionally a small projection of activity medial to the iliac artery is seen on the affected side because of activity in the proximal portion of the obstructed spermatic vessels (nubbin sign). On the tissue phase a decreased activity may be seen in the region of the affected testicle.

In late torsion an increased perfusion is demonstrated on the affected side as a result of scrotal flow from the pudendal arteries. The ischemic testicle is seen as a cold area on the static tissue phase images. A distinct surrounding halo of increased activity develops from the hyperemia of the dartos. In missed torsion the hemiscrotal hyperemia, the nubbin sign and the dartos

halo become increasingly prominent.

The scintigraphic findings of epididymitis and epididymoorchitis, are usually different from those of torsion. The early dynamic phase images reveal increased activity in the spermatic cord vessels. Classically in the hemiscrotal phase a crescent configuration of increased activity is seen laterally to the epididymis. On static images there is diffuse increased activity in the region of the epididymis, but activity is normal within the testicle (i.e. epididymitis). With the involvement of the testicle there is increased tracer activity in the whole of the hemiscrotum (i.e. epididymoorchitis).

In torsion of the testicular appendages, the scintigraphic findings may be normal or may show evidence of low-grade inflammation mainly in the venous phase. Tissue phase may show a focal area of increased activity at the upper pole (clinically seen as the blue dot sign).

Testicular abscesses exhibits increased flow on the dynamic phase images along with a non specific halo sign in the tissue phase images as seen in the delayed or late torsion of testicle.

In varicocele the demonstration of late accumulation of activity in the venous structures is diagnostic [8]. Carefully performed scrotal scintigraphy has a sensitivity of 96% and specificity of 98% with an overall accuracy of 96% [9]. Because of its greater specificity than CDFI (98% versus 77%), scintigraphy may help to prevent unnecessary surgery when colour doppler ultrasonography shows an equivocal flow [10]. The remaining false negative cases are primarily due to spontaneous detorsion or incomplete torsion and the scan therefore reflects the actual state of perfusion at the time of examination. The positive predictive value of a cold lesion is 63%, reflecting the myriad of other processes, often identifiable by their clinical presentation [9]. Scrotal scintigraphy is a simple, accurate and functional imaging technique to diagnose acute scrotal pain giving the clinician a diagnostic edge.

Conflicts of Interest

None identified

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Book Review

SM Balaji, editor. Text book of Oral and Maxillofacial Surgery. India: Elsevier Publications. 1st Edition. Paperback & Soft bound. Pages-687, Price Rs.1200/- ISBN Number 13:978-81-3120-300-2.

This book presents a detailed and authoritative exposition of basic principles of Oral and Maxillofacial Surgery. From basic oral surgical procedures encountered by general practitioner to advance and complex surgical procedures that need to be referred to oral and maxillofacial surgery specialists, all are covered in sufficient detail with judicious mix of text and illustrations.

The features includes exodontia, dental implantology, management of medical emergencies, medicolegal consideration in oral surgery. It covers recent advances on alloplastic materials, bioresorbable plates, distraction osteogenesis, lasers in dentistry, piezoelectric surgery. Complete coverage of all important topics from examination point of view for both undergraduates and

postgraduate students is included. Case photographs illustrate the concepts and help the in grasping their significance, Practical and pictographic approach to explanation of surgical procedures provide an edge over the conventional method of learning. Colour illustrations, photographs, pathological pictures, flow charts, boxes and tables are profusely used throughout the text to make relevant clinical situations self explanatory. The emphasis is laid upon the language that is simple, understandable and exclusively designed for the students whilst maintaining its international standards.

This book is a must for undergraduate and postgraduate dental students and will prove to be useful for general practitioners also.

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