

Diagnostic Imaging Pathways - Scrotal Pain (Acute)

Population Covered By The Guidance

This pathway provides guidance for the imaging investigation of male patients with acute scrotal pain.

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Quick User Guide

Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

Clicking on the **PINK** text box will bring up the full text.

The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

SYMBOL	RRL	EFFECTIVE DOSE RANGE
	None	0
	Minimal	< 1 millisieverts
	Low	1-5 mSv
	Medium	5-10 mSv
	High	>10 mSv

Pathway Diagram

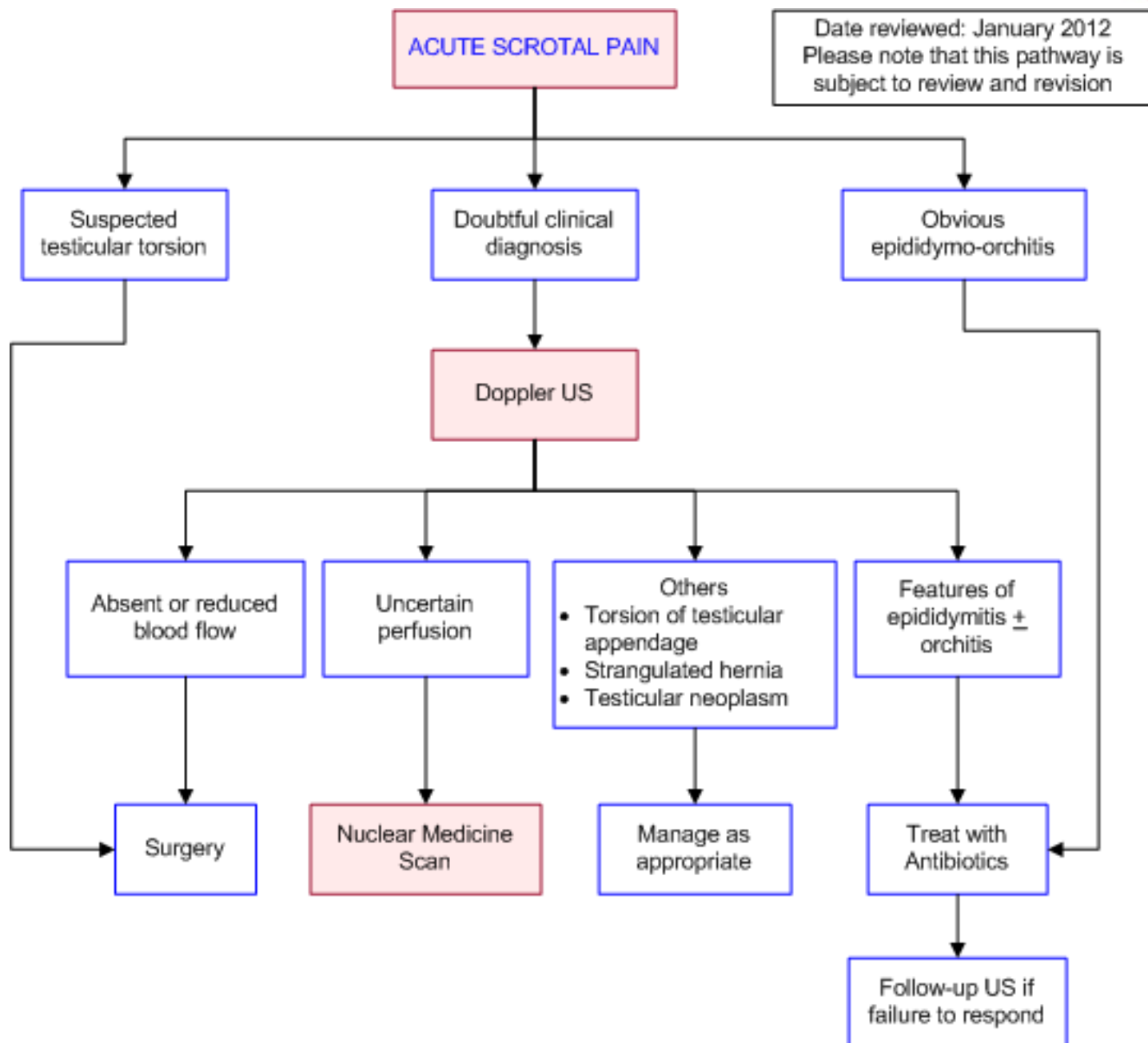
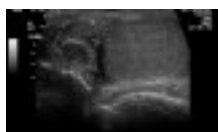


Image Gallery

Note: These images open in a new page

1



Epididymo-Orchitis

Image 1 (Ultrasound): Swelling of the right epididymis with associated mild orchitis. Doppler images (not shown here) demonstrate increased vascularity.

2

Testicular Tumour

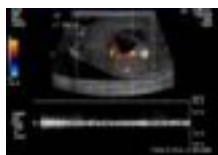


Image 2 (Ultrasound): Solid and cystic lesion with thick walls and marked vascularity in some areas. The appearances are consistent with a tumour.

3a



Testicular Tumour

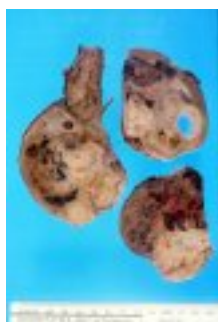
Image 3a: Orchidectomy specimen showing complete replacement of the normal testicular parenchyma with the classical "cut-potato" appearance of a seminoma. The tunica albuginea is intact.

3b



Image 3b (H&E, x2.5): Histological section of a seminoma showing groups of malignant cells with large nuclei and prominent nucleoli. There are also intervening fibrous bands with an infiltrate of lymphocytes and plasma cells.

4a



Testicular Tumour

Image 4a (H&E, x2.5): Orchidectomy specimen showing a teratoma with areas of cyst formation and haemorrhage.

4b

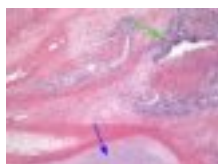


Image 4b (H&E, x2.5): Histological section of a teratoma (non-seminomatous germ cell tumour) showing hyaline cartilage and islands of columnar epithelium.

Teaching Points

- There are many causes of acute scrotal pain. Torsion of the testis, epididymo-orchitis and torsion of the testicular appendage are the most common
- Ultrasound with Doppler is the investigation of choice but is not routinely indicated in clinically suspected epididymo-orchitis
- Ultrasound is indicated if there is failure of response to treatment in epididymo-orchitis
- Doppler ultrasound is indicated in suspected testicular torsion. If there is a high clinical suspicion, surgery may be indicated without imaging

Acute Scrotal Pain

- Differential diagnoses include [1](#)
 - Torsion of the testis
 - Torsion of the testicular appendages
 - Acute epididymitis
 - Mumps orchitis
 - Strangulated hernia
 - Inflammatory type of testicular tumour

- Acute hydrocele
- Traumatic haemorrhage
- Imaging is useful in the investigation of acute scrotal pain [2](#)
 - If there is a clinical doubt as to the cause of the acute scrotal pain or
 - If there is failure to respond to treatment
- Acute testicular torsion is a clinical diagnosis and prompt diagnosis is critical, as it requires urgent surgical intervention. Radiological investigations should not delay surgery [3](#)
- If imaging does not provide a clear diagnosis, the patient should be surgically explored [3](#)

Colour Doppler Ultrasound

- "Gold standard" in the diagnostic imaging of testicular torsion (sensitivity 82-90% and specificity approaching 100%) [4,5,6](#)
- Reliably assesses blood flow within the testis. In testicular torsion, blood flow is markedly reduced or absent [4](#)
- Clinical correlation with imaging findings are essential as a spontaneous detorsion of a torqued testis can appear ultrasonographically identical to epididymo-orchitis
- In suspected epididymo-orchitis, US allows [2](#)
 - Confirmation of the diagnosis
 - Excludes testicular torsion
 - Scrotal assessment if there is difficulty in palpating the epididymis separately from the other intrascrotal structures
 - Monitor complications such as infarction or abscess, which may require surgical intervention
- US features of epididymitis include [2](#)
 - Epididymal enlargement
 - Hypoechogenicity
 - Skin thickening
 - Increased blood flow (hypervascularity of epididymis and/or testicle has a sensitivity of 91-100% for epididymitis +/- orchitis) [8](#)
- Helps localise a scrotal swelling (testicular or extra-testicular) [1,9](#)
- >98% sensitivity for testicular neoplasms (which may present with pain) [9](#)
- Limitations [4,6,10](#)
 - False negatives in incomplete torsion and in spontaneous de-torsion
 - Occasional inability to demonstrate flow in a normal testis
 - Discordant epididymal and scrotal flow in spermatic cord torsion
 - Flow in patients with testicular necrosis

Nuclear Medicine Scan

- Used to clarify the perfusion if there is uncertainty on the colour Doppler ultrasound [1](#)
- 90-100% sensitivity and specificity for distinguishing ischaemia from infection [11](#)
- Uncommonly requested nowadays given the high accuracy of colour Doppler ultrasound
- Limitations - slightly lower specificity in the diagnosis of ischaemia versus other photon deficient lesions, such as hydrocele, spermatocele, oedematous appendix testis and inguinal hernia that can be mistaken for an avascular testis [12](#)
- Disadvantages - requires interpretative experience and careful technique and must be performed in a timely manner



References

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. [Download the document](#)

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2. Lau MWM, Taylor PM, Payne SR. **The indications for scrotal ultrasound.** Br J Radiol. 1999;72:833-7. (Level II/III evidence)
3. Hendrikx AJM, Dang L, Vroegindeweij D, et al. **B-mode and colour-flow duplex ultrasonography: a useful adjunct in diagnosing scrotal disease?** Br J Urol. 1997;79:58-65. (Level II/III evidence)
4. Wilbert DM, Schaerfe CW, Stern WD, et al. **Evaluation of the acute scrotum by color-coded Doppler ultrasonography.** J Urol. 1993;149(6):1475-7. (Level II evidence). [View the reference](#)
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8. Horstman WG, Middleton WD, Melson GL. **Scrotal inflammatory disease: color Doppler US findings.** Radiology. 1991;179:55-9. (Level II/III evidence)
9. Guthrie JA, Fowler RC. **Ultrasound diagnosis of testicular tumors presenting as epididymal disease.** Clin Radiol. 1992;46:397-400. (Level II evidence)
10. Allen TD, Elder JS. **Shortcomings of color Doppler sonography in the diagnosis of testicular torsion.** J Urol. 1995;154(4):1508-10. (Level IV evidence)
11. Melloul M, Paz A, Lask D, et al. **The value of radionuclide scrotal imaging in the diagnosis of the acute testicular torsion.** Br J Urol. 1995;76(5):628-31. (Level II evidence)
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Further Reading

1. Pavlica P, Barazzi L. **Imaging of the acute scrotum.** Eur Radiol. 2001;11:220-8. (Review article)

Information for Consumers

Information from this website	Information from the Royal Australian and New Zealand College of Radiologists' website
<p>Consent to Procedure or Treatment</p> <p>Radiation Risks of X-rays and Scans</p>	<p>Radiation Risk of Medical Imaging for Adults and Children</p> <p>Ultrasound</p>



[Ultrasound](#)

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