6.4
Testicular and scrotal problems

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Overview

Excluding dermatological conditions, testicular and scrotal lesions include hydrocele, hernia, spermatocele, varicocele, tumours, haematocele, and two painful conditions, epididymitis/orchitis and torsion of the spermatic cord ('testicular torsion'). These problems are commonly encountered by primary care physicians. For instance, acute epididymitis is one of the leading causes of disability of men in the military, and had been one of the leading urological diagnoses requiring hospitalization. Testicular torsion affects one in 4000 males under 25 years of age. Varicoceles are rare before puberty, but affect 15 per cent of the adult population. Testicular tumours have variable incidences in different races, but typically afflict young men in the productive years of life.

History and physical

The initial management of scrotal and testicular problems relies heavily on the history and physical examination since the correct diagnosis can often be arrived at without extensive invasive investigations. The patient may have been asymptomatic and the abnormality noted on routine self-examination. Dysuria, microhaematuria, or urethral discharge may suggest epididymo-orchitis. Sudden onset of severe pain would suggest testicular torsion. Any history of trauma and constitutional signs and symptoms should be elicited. 'Referred pain' to the scrotal area from other sites should be kept in mind.

Scrotal and inguinal examination should be conducted in a warm room, both with the patient standing and supine. Attention should be paid to the size of any mass, its location, and its relationship to the normal anatomical structures. Note should be made of the size, shape, consistency, and orientation of *both* testes. The cremasteric reflex should be elicited in cases of painful scrotal masses, since if the reflex is present, testicular torsion unlikely (vide infra). Transillumination of the scrotum should be performed (to assess the presence and nature of fluid collections) with a flashlight placed under the scrotum in a darkened room. Clear fluid collections, as in hydroceles and spermatoceles, should transilluminate as a 'glow' whereas blood and solid lesions will not (vide infra).

Cryptorchidism

An undescended or ectopic testis may have arrested or strayed from the normal descent route. The most common ectopic location is the prepubic area, superficial to the external oblique aponeurosis. Cryptorchid testes, often dysgenetic, are clinically important because of a much higher incidence of malignancy than a normally descended testis, and may also compromise fertility potential. There may be pain with spontaneous torsion in their abnormal location. If a cryptorchid testis is discovered under the age of 5, hormone therapy (human chorionic gonadotrophin) to induce descent is first instituted and if unsuccessful,

orchiopexy should be performed. Although the risk of malignancy is not lessened by orchidopexy, the testis in the intrascrotal location would be more amenable to monitoring for malignancy.

Varicocele

A varicocele is the dilation of the pampiniform plexus of spermatic veins, usually occurring on the left side due to difference in gonadal venous drainage between the two sides. This occurs in up to 15 per cent of men and is usually asymptomatic. Some patients complain of a dragging sensation. The typical appearance is that of a bag of worms within the superior aspect of the scrotum. The testis may be atrophic. Although large varicoceles are evident in the supine position, the subtle cases may only be elicited with the patient performing a Valsalva manoeuvre while standing. Presence of a right varicocele should increase the suspicion of possible venous obstruction from retroperitoneal lymphadenopathy (e.g. from lymphoma or testicular cancer) or tumour thrombus within the vena cava, most commonly from renal cell carcinoma.

Varicoceles may be associated with oligospermia and infertility. Possible explanations include venous congestion and unfavourably high temperature for spermatogenesis. Some fertile patients may have large varicoceles, whereas a sub-fertile male does not necessarily have one. Atrophy of the ipsilateral testis is suggestive of an infertility problem. If the varicocele is discovered during infertility work-up, surgical correction to decrease venous back-flow may result in improvement in semen analysis in approximately 60 per cent of cases, with subsequent improved fertility potential. Occasionally, varicocele surgery is performed for severe discomfort from testicular congestion.

Haematocele

A haematocele is a collection of blood between the tunica vaginalis and tunica albuginea. There often is a history of blunt trauma from sports injuries or other physical contact. There usually is significant discomfort with an expanding scrotal mass and possibly bleeding from scrotal skin violation. Haematoceles do not transilluminate. Testicular rupture from high-energy impact should be ruled out by careful examination of the testis, but since the testis is often obscured by haematoma formation, scrotal

ultrasound examination (if available) is recommended. Suspected testicular rupture expanding haematoma or penetrating trauma to the scrotum warrant surgical exploration.

Hydrocele

A hydrocele is a fluid collection between the visceral and parietal layers of the tunica vaginalis. The etiology is often idiopathic. However, rapid enlargement would suggest an underlying infectious or malignant process. A hydrocele usually covers the anterior testicular surface and may extend into the spermatic cord area. However, the examining fingers should be able to reach above the swelling as opposed to a hernia where the swelling continues up along the spermatic cord. Careful palpation of the testis and epididymis is important. Hydroceles should transilluminate. If the tense swelling precludes adequate testicular examination, scrotal ultrasound examination, if available, should be

performed. Aspiration of the fluid for diagnostic purposes risks bleeding, infection, and possible tumour spillage and is not recommended unless ultrasonography is not available. An asymptomatic ‘idiopathic’ hydrocele may be treated conservatively with observation. Definitive treatment, if necessary, should be by open surgery to avoid reaccumulation of fluid, which would occur with transcutaneous needle aspiration.

In an infant or child, hydroceles usually indicate patency of the processus vaginalis with communication between the scrotal sac and peritoneal cavity, associated with an indirect inguinal hernia. Typically, these hydroceles fluctuate in size. The parents may notice a sudden increase in the scrotal swelling when the child cries. If the communication has not closed by 1 year of age, surgical repair is recommended.

Spermatocele

A spermatocele is a usually painless spherical cystic mass distinct from the testis, typically arising near the junction of the ‘testis proper’ and the head of the epididymis. Occasionally, a large spermatocele may mimic a hydrocele or hernia. The whitish fluid of a spermatocele should be transilluminable. Surgical excision can be undertaken if the lesion has become large and causes limitation to physical activities.

Epididymo-orchitis and epididymitis

The main challenge is to distinguish this painful lesion from testicular torsion. Epididymo-orchitis usually occurs in sexually active young men and older men with urinary difficulties. Torsion more commonly occurs in adolescents although there is overlap between the two age distributions. Epididymitis usually presents with gradual onset of pain, often without clear precipitating events. Associated urinary tract symptoms may include dysuria, frequency, and urethral discharge. The epididymis is tender and may be very swollen while the testis is non-tender. In contrast, testicular torsion has a rock-hard consistency and has a horizontal lie. Although relief of pain with scrotal elevation has been described as a sign suggestive of epididymitis and conversely aggravation of pain as suggestive of torsion, this (‘Prehn's’) sign is considered unreliable. Urinalysis and smear of urethral discharge are useful diagnostically. If one cannot clinically differentiate with reasonable certainty between the two, Doppler scrotal ultrasound (if available) is helpful. In torsion, there should be no flow in the affected testis whereas there is high flow from inflammation in epididymo-orchitis. Nuclear scintigraphy (scrotal scan) is a more labour-intensive alternative in assessing blood flow. Testicular torsion is a urological emergency (see below). With epididymitis, the recommended treatment includes antibiotics (see Chapter 6.6) and avoidance of strenuous physical activities. In some countries, tuberculosis infections may involve the epididymis and testis, often presenting as draining sinuses or scrotal abscesses.

Testicular torsion

Testicular torsion is associated with abrupt onset of pain typically affecting pre-pubescent or adolescent boys although adults may also be afflicted. There may have been previous episodes which settled spontaneously. The testis lies horizontally, instead of vertically, due to a developmental anatomic deficiency in anchoring to the inferior scrotum. The defect is

often bilateral. The ‘freely hanging’ testis is prone to rotate on its axis, either spontaneously or with provocation, ‘twisting’ the cord and becoming elevated. Venous flow is obstructed first with ongoing arterial inflow, engorging the testis. Eventually arterial flow ceases. Testicular infarction results if blood flow is not re-established within 6–8 h. The presence of the cremasteric reflex indicates that there is *no* torsion. The diagnostic challenge of a painful non-traumatic scrotal mass is to distinguish between testicular torsion and epididymitis (vide supra). If testicular torsion is suspected, urgent exploration is imperative. If confirmatory imaging studies are not available in equivocal cases, surgical exploration is indicated.

One may attempt manual de-torsion prior to surgical exploration. With the examiner standing on the supine patient's right side facing him cephalad, the left testis is manually turned clockwise and the right testis counter-clockwise. Even with successful de-torsion, subsequent formal bilateral orchidopexy to prevent future recurrences is indicated.

Torsion of testicular appendages

A vestigial remnant of the Wolffian or Mullerian duct may suddenly infarct with torsion, usually in a child. This pea-sized lesion presents as a discrete tender spot near the epididymal head or tail. In fair-skinned children, a blue dot indicating haemorrhagic engorgement of the lesion may be evident. This condition can be treated conservatively. However, in the absence of definite clinical signs and when the diagnosis is uncertain, surgical exploration is indicated to rule out testicular torsion.

Testicular tumours in adolescents and adults

Testicular cancer, most commonly germ cell tumour (GCT), comprises only 1 per cent of all malignancies in males, with a peak incidence at between 20–35 years of age. It is, apart from lymphoma, the most common malignancy at that age group in Caucasians. Overall incidence in Europe and North America is approximately five per 100 000 males. The condition is uncommon in Asians and rare in African races.

The most commonly accepted predisposing factor is cryptorchidism. GCTs are classified as seminomas and non-seminomas (embryonal cell carcinoma, yolk cell tumour, teratomas, and choriocarcinoma).

Clinical presentation

The most common presentation is an asymptomatic painless hard testicular mass. It may also be associated with a hydrocele. Patients occasionally present with systemic symptoms from metastatic disease. The first site of lymph node involvement is in the renal hilar area (presenting as an abdominal mass), subsequently spreading to iliac, mediastinal, and cervical nodes. The cancer also disseminates haematogenously to lungs and less commonly, liver and brain. Thus, patients may present first with pulmonary symptoms or a chest X-ray showing lung nodules and pleural effusions.

Physical examination

Neck, chest, abdomen, and both testes should be examined carefully keeping in mind

potential ectopic testicular locations. If a hydrocele precludes adequate testicular examination, scrotal ultrasound examination (if available) should be performed rather than needle aspiration.

Investigations

Initial investigations should include baseline blood serum markers [alpha feto-protein (*a*FP) and beta human chorionic gonadotrophins (*b*HCG)]

and chest X-ray. Elevated markers strongly suggest a diagnosis of germ cell tumour (seminoma or non-seminomas). However, normal markers do not preclude the possibility of a GCT. Seminomas do not have elevated *a*FP and rarely may have abnormal *b*HCG. Serum markers are invaluable for monitoring disease progress and response to treatment. Other useful markers include lactate dehydrogenase (LDH) and placenta-like alkaline phosphatase.

Management

Any suspicious testicular masses should be explored through an inguinal incision (not scrotal) with early control of the spermatic cord, to minimize possible tumour dissemination. Radical orchidectomy involves dividing the spermatic cord high at the internal inguinal ring area. Subsequent management is determined by: (i) tumour cell type; and (ii) stages of disease. Staging studies include computerized tomography of the abdomen and chest (if available). Seminomas are more radiosensitive than non-seminomas and both are chemosensitive. Management includes treatment of possible retroperitoneal lymph node involvement (even with a normal CT scan and serum tumour markers) and treatment of metastatic disease. Options include close surveillance, radiotherapy, retroperitoneal lymph node dissection, chemotherapy, or combinations thereof, depending on cell type and stage. The prognosis is favourable with expected 5 year survival of 99 per cent for tumours confined to the testis, 95 per cent for tumours with limited metastatic retroperitoneal disease, and 75–80 per cent for widespread distant metastatic disease. The main challenge is to minimize the treatment-related morbidity without compromising the therapeutic effect.

Testicular tumours in children

The majority of childhood testicular tumours occur under 2 years of age and comprise only 1 per cent of childhood neoplasms, 75 per cent of which are malignant. Most are GCTs, but a smaller percentage are stromal tumours, gonadoblastoma, leukaemia, and lymphoma infiltrates. GCTs, mostly yolk sac tumours, account for about 60–70 per cent. Leydig cell tumours are relatively common with typical presentation of precocious puberty and gynaecomastia. Yolk sac tumours have a more favourable prognosis if diagnosed and treated at less than 1 year of age. In many instances, radical orchidectomy with follow-up suffices. In more advanced cases, chemotherapy, radiation, and retroperitoneal lymph node dissection are also performed.

Paratesticular tumours

A solid non-tender mass in the epididymis suggests a neoplastic process when epididymitis

has been ruled out. Adenomatoid tumours are the most common, benign paratesticular tumours being most prevalent in ages 30–40 and are solid, spheroid masses, which are usually asymptomatic. Confirmation of the epididymal location can be made on ultrasound examination. Treatment is by local excision (epididymectomy).

Other common paratesticular neoplasms include sarcomas, most commonly rhabdomyosarcoma. Often, there is a delay in seeking medical attention, with the lesions being mistaken for hernias and hydroceles. One has to be suspicious of gradually enlarging painless scrotal swellings, especially if the presentation is atypical for a benign entity. Rhabdomyosarcomas disseminate lymphatogenously and haematogenously, involving lymph nodes, lungs, and liver.

Key points

- Detailed history and physical examination is crucial.
- Surgical exploration is mandatory for suspected torsion.
- Tumours are often asymptomatic hard masses.

Further reading

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