

CASE FOUR

SHORT CASE NUMBER: 3_9_4

CATEGORY: CHILDREN & YOUNG PEOPLE

DISCIPLINE: PAEDIATRICS_SURGERY

SETTING: EMERGENCY DEPARTMENT

TOPIC: COMMON SURGICAL CONDITIONS IN CHILDREN

Case

Harper Jones, aged 6 months, presents with a painful mass in his groin region.
Harper has started vomiting and looks unwell.

Questions

1. Outline your management of Harper.
 2. How do the following conditions present: inguinal hernia, hydrocele, undescended testes and torsion of the testes.
④ How to differentiate from torsion of testicular appendage.
④ Differentiate between direct & indirect
 3. Summarise using a table, the common abnormalities of the umbilicus in children. (g)
 4. In point form, differentiate between the following conditions: smegma, balanitis, phimosis, paraphimosis and hypospadias.
 5. What are the key arguments for and against routine circumcision?
 6. A 3 month infant presents with a midline neck swelling. In a table, summarise your diagnosis and differential diagnosis and how you would distinguish between these on clinical examination.
 7. What is torticollis and how do the causes differ in younger compared to older children?
- ④ How to differentiate between undescended testes and retractile testis.*
④ What is the medical term.

Suggested reading:

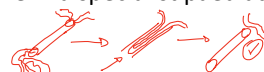
- Beasley, S.W. & King, K.K. (2012) Surgical conditions in older children. In. M. South & D. Isaacs (Eds.). *Practical Paediatrics* (7th Ed) (pp 266 – 274). Edinburgh: Churchill Livingstone/Elsevier.

ANSWERS

1. Outline your management of Harper.

Obtain a complete history and perform a physical examination to establish a diagnosis. The most likely diagnosis in this case is a **strangulated inguinal hernia**. An immediate attempt should be made to reduce the hernia manually. This is done by first disimpacting the hernia at the external inguinal ring, and then reducing it along the line of the inguinal canal. Fortunately, most hernias that become stuck can be reduced manually; the hernia can then be repaired as an elective procedure within a few days. This is best done in a specialist paediatric surgical centre.

① **Manually reduce** (Push hernia back through external/superficial inguinal ring) → then up along inguinal canal. *Alleviates immediate symptoms*



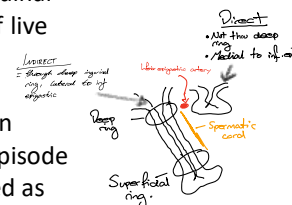
② **Surgically repair** *Prevents recurrence*

2. How do the following conditions present: inguinal hernia, hydrocele, undescended testes and torsion of the testes?

Inguinal hernia

A widely patent proximal processus vaginalis allows bowel (and, in girls, the ovary as well) to enter the inguinal canal, producing a reducible lump in the groin called an indirect inguinal hernia. This occurs in about 2% of live male births but is less frequent in girls. The greatest incidence is in the first year of life.

The usual presentation is that of an **intermittent swelling**, overlying the **external inguinal ring** that has been noticed by a parent. At times it may appear to cause **discomfort**. It is most likely to be obvious during an episode of crying or straining, and in infants may be seen during nappy changes. Inguinal hernias should be repaired as soon as practicable.



Strangulation of inguinal hernias is common, particularly during the first 6 months of life. **Strangulation** can be recognized **when the groin swelling becomes irreducible** and can be associated with **irritability and crying** (due to pain and abdominal cramps) and vomiting. If left untreated, a strangulated hernia may damage the incarcerated bowel and, occasionally, by compressing the testicular vessels may lead to testicular atrophy.

Hydrocele:

A hydrocele presents as a painless cystic swelling around the testis in the scrotum. It contains peritoneal fluid that has tracked down a narrow but patent processus vaginalis. It transilluminates brilliantly. When the hydrocele is lax, the testis can be felt within it. The upper limit of the hydrocele can be demonstrated distal to the external inguinal ring, distinguishing it from an inguinal hernia, where the swelling extends through the external inguinal ring. There is no impulse on crying or straining. Hydroceles are common in the first few months of life, do not cause discomfort and usually disappear spontaneously. Surgery is only indicated if the hydrocele persists beyond 2 years of age.

Undescended testes

Undescended testis (or cryptorchidism) is a term used to describe the testis that does not reside spontaneously in the scrotum. Undescended testes occur in about 2% of boys, being more common in premature infants.

Spontaneous descent of the testis is **unlikely beyond 3 months post-term**. Cryptorchidism is important to detect because it will result in reduced fertility if left untreated. It is suspected that the higher temperature to which an undescended testis is subject impairs spermatogenesis.

The diagnosis is made by examining the inguinoscrotal region. Normally, the testis should be found within the scrotal sac. In cryptorchidism the **scrotum looks empty**. The testis is 'milked' down the line of the inguinal canal towards the scrotum and is pulled gently towards the scrotum. If the **testis cannot be brought into the scrotum or will not remain there spontaneously** it is considered undescended.

Clinically, it may be difficult to distinguish a retractile testis from an undescended testis. In most normal boys the testis resides in the bottom of the scrotum, but the cremasteric reflex, which is prominent during mid-childhood, may cause it to move upwards, sometimes completely out of the scrotum. A **retractile testis** found outside the scrotum initially can be **brought down into the normal position** and should **stay there spontaneously**, at least until the cremasteric reflex is stimulated. An undescended testis will not stay in the scrotum spontaneously and

Differentiate between undescended and retractile testis.

usually cannot even be coerced beyond the neck of the scrotum. It is often **smaller than a normal testis on the other side.**



Torsion of the testes
 Similar presentation but resolves spontaneously or not. If can't rule out then must assume full torsion & go in for surgical exploration.

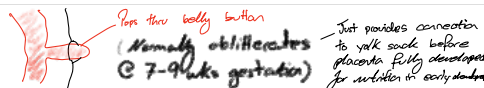
There are a number of conditions that cause an acutely painful or enlarged scrotum of which torsion of a testicular appendage is the most common, and torsion of the testis itself the most important. In both conditions the boy complains of severe pain in the scrotum. In the early stages of torsion of a testicular appendage, a blue-black 'pea-sized' swelling which is extremely tender to touch may be seen through the skin of the scrotum near the upper pole of the testis. Palpation of the testis itself causes no discomfort. Later, a reactive hydrocele develops, the tenderness becomes more generalized and the clinical features may make it difficult to distinguish from torsion of the testis. Where torsion of the testis has occurred, both the testis and the epididymis are exquisitely tender (unless necrosis has already occurred) and the testis may be lying high within the scrotum. In older boys the pain radiates to the ipsilateral iliac fossa and may be associated with nausea and vomiting, producing symptoms similar to those of appendicitis, which highlights the importance of always examining the scrotum in boys presenting with lower abdominal pain.

→ Torsion Mx:
 ① Urgent surg review
 ② Fasting/clear fluids until surg review
 ③ Analgesia

3. Summarise using a table, the common abnormalities of the umbilicus in children.

Abnormalities of the umbilicus

Abnormality	Comment
Exomphalos (U.S. NOT! Exomphalos) egg-on-pinkies ② → ③	Large defect at umbilicus containing bowel and liver covered by a sac Co-existing heart and kidney abnormalities common Requires surgical closure
Gastroschisis ③ No sac	A small defect immediately to the right of the umbilicus through which bowel (and sometimes the gonads) herniated Requires surgical repair
Umbilical hernia	Common, most resolve, but can reappear during pregnancy Asymptomatic Skin covered
Umbilical sepsis ('omphalitis')	Serious condition requiring treatment with intravenous antibiotics
Umbilical granuloma (Cluster of immune cells around umbilicus)	Often pedunculated Common, treat with silver nitrate
Ectopic bowel mucosa	Treat with silver nitrate
Patent vitellointestinal duct	Sinus opening at umbilicus Communication with ileum Discharges faecal fluid and gas
Patent urachus	Communication with bladder and discharges urine



Urachus connects fetal bladder to allantoic sac to drain urine. Closes off before birth to become median umbilical ligament.

4. In point form, differentiate between the following conditions: smegma, balanitis, phimosis, paraphimosis and hypospadias.

Smegma

- Smegma accumulates beneath the adherent foreskin.
- Smegma is normal, and is released spontaneously as the foreskin separates from the glans penis. When it is released, it may be associated with some redness and irritation of the foreskin for a day or so: this, too, is a normal process.
- It appears as asymmetrical accumulations of yellow-tinged material predominantly in the coronal groove beneath the foreskin. There may be sufficient smegma to produce a noticeable swelling, which may be misdiagnosed as a dermoid cyst or tumour. It is often misinterpreted as being mid-shaft because a small child's coronal groove may be a long way from the tip of the foreskin.

Balanitis = infection ('itis')

- Infection can develop beneath the foreskin and, if severe, pus may appear from the end of the foreskin.

- Balanitis is often associated with phimosis. Infection may cause considerable redness and swelling of the penile shaft, necessitating treatment with either topical or oral antibiotics.

Phimosis

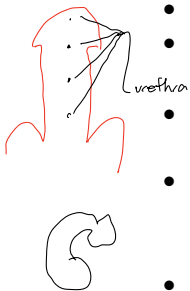
- In phimosis the opening at the tip of the foreskin has narrowed down to such a degree that the foreskin cannot be retracted. The external urethral meatus is not visible.
- Phimosis must be distinguished from the normal adherence of the foreskin to the glans.
- In most boys, phimosis can be treated by application of steroid ointment (e.g. betamethasone valerate ointment) to the tight, shiny part of the foreskin. This usually obviates the need for circumcision. However, marked previous inflammation, infection, skin splitting and balanitis xerotica obliterans can lead to marked scarring of the foreskin and phimosis, and in many of these children the only reasonable treatment is circumcision.
- Sometimes the severity of phimosis is such that there is ballooning of the foreskin on micturition, and on rare occasions it may even cause urinary retention with a distended bladder.
- A degree of phimosis is common in infancy but tends to resolve spontaneously in the first few years of life, and is not considered abnormal in this age group.

Paraphimosis

- Paraphimosis occurs when a mildly phimotic foreskin has been retracted over the glans and has become stuck behind the coronal groove, causing oedema of itself and the glans penis.
- It is a painful and progressive process.
- Treatment involves gentle manipulation of the foreskin forwards, which may require a general anaesthetic.
- Circumcision is not performed at this time, but a few children may need it subsequently if the phimosis does not respond to topical application of steroid ointment.

Hypospadias

- The foreskin looks square and hangs off the penis, and the shaft of the penis is bent ventrally.
- The two main problems in hypospadias are:
 - the location of the urethra (which can be found on the ventral side of the shaft of the penis, proximal to its correct position)
 - chordee (ventral angulation of the shaft and glans) Correction of chordee to straighten the penis is required to allow later successful sexual function.
- Circumcision is **absolutely contraindicated** in hypospadias because the skin of the prepuce is used during repair of the hypospadias.
- Severe hypospadias may be indicative of an intersex abnormality. For example, when there is penoscrotal hypospadias and a bifid scrotum, the scrotum should be examined carefully for testes, because some of these children may be females with congenital adrenal hyperplasia; the labioscrotal folds are labia rather than scrota, and the presumed urethral opening may in fact be the entrance to the vagina.



5. What are the key arguments for and against routine circumcision?

The indications for circumcision remain controversial.

Arguments for circumcision

- Circumcision lowers the risk urinary tract infection in the first year of life (1 in 500 in circumcised vs 1 in 100 in uncircumcised).
- Although a rare condition (1/100,000), the risk of cancer of the penis is reduced 10 fold in circumcised males.
- Studies are conflicting, but some report that circumcised males have a slightly lower risk of getting sexually transmitted infections. Only in Sub-Saharan Africa is the risk of HIV higher in uncircumcised males.
- Circumcision eliminates risk of balanitis.
- Circumcision eliminates the risk of phimosis
- Genital hygiene, which is particularly important in unsanitary conditions, may be easier after circumcision.

Arguments against circumcision

- The overall complication rate varies from 0.2-10%.
- Local infection and bleeding are the most common.
- Infection is usually minor, but septicaemia and meningitis have been rarely described.
- Damage to the meatus of the urethra leading to a meatal stricture.
- Secondary phimosis and secondary chordee.
- Problems with healing of the circumcision wound. - Wound dehiscence
- Almost all uncircumcised boys can be taught proper hygiene that can lower their chances of getting infections, cancer of the penis, and sexually transmitted diseases.
- Loss of penis (1/1,000,000).

Complications

- Infection
- bleeding
- Urethral damage
- Phimosis
- Wound dehiscence
- loss of penis (1 in a million)

6. A 3 month infant presents with a midline neck swelling. In a table, summarise your diagnosis and differential diagnosis and how you would distinguish between these on clinical examination.

Midline neck swellings	
Cause of swelling	Comment
Thyroglossal cyst	Most common (80% of midline neck swellings) Moves with tongue protrusion and swallowing Attached to hyoid bone
Ectopic thyroid	Less common May be only thyroid tissue present May be difficult to distinguish from thyroglossal cyst. Do thyroid isotope scan for diagnosis
Submental lymph node/abscess	Check inside mouth for primary infection Other cervical lymph nodes may be enlarged
Dermoid cyst	Small, mobile, non tender Yellow tinge through skin In subcutaneous layer
Goitre	Lower neck
Cystic hygroma	Hamartoma Usually evident from birth May be extensive

7. What is torticollis and how does causation differ in younger compared to older children?

Torticollis, or wry neck, is a condition in which the head is tilted to one side and the chin is elevated and turned towards the other side.

Causation in the younger children

Postural torticollis is a benign condition that present at birth and usually resolves in a few months and is due to intrauterine position.

A sternomastoid tumour is not present at birth and presents in the third week of life with a hard lump in the neck, or that the head cannot be turned to one side. The head is flexed slightly to the side of the shortened sternomastoid muscle, and is turned to the contralateral side. There may be a history of breech or forceps delivery.

Other conditions occurring at a younger age include cervical hemivertebrae and benign paroxysmal torticollis of infancy.

Causation in the older children

Causation in older children is generally due to acquired conditions or previously undetected congenital conditions. These include imbalance of ocular muscles due to strabismus, posterior fossa tumours, atlanto-occipital/axial subluxation following injury, Sandifer's syndrome – abnormal head tilt secondary to gastro-oesophageal reflux, and lateral cervical lymphadenitis.