

Renal injury

- In civilian life, injuries to the kidney result most often from either blows or falls on the loin or crushing injury to the abdomen, typically in a road traffic accident.
- Haematuria *after trivial injury* to the kidney should suggest the possibility of a pre-existing disease, e.g. calculus, hydronephrosis or tuberculosis.
- The degree of injury varies considerably from :-
 - A. Small subcapsular haematoma
 - B. Complete tear through the kidney (laceration)
 - C. Avulsion of one pole
 - D. Avulsion of the renal pedicle.
- Closed renal injury is usually extraperitoneal.
- In young children who have very little extraperitoneal fat, the peritoneum, which is closely applied to the kidney, can tear with the renal capsule, leaking blood and urine into the peritoneum.

Haemorrhage

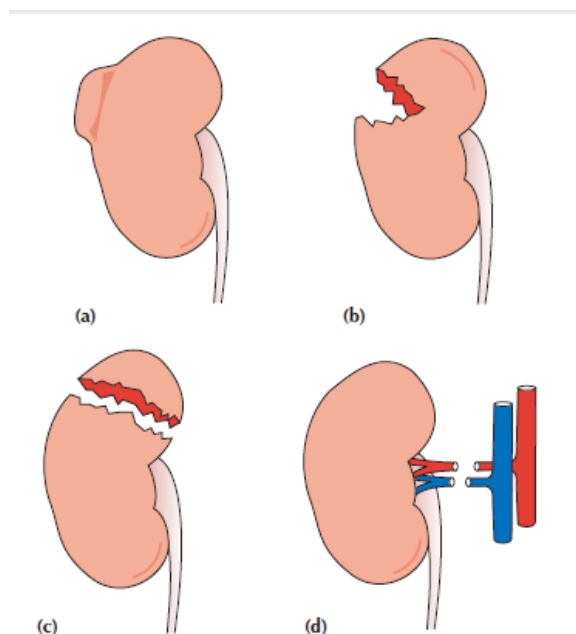
- Life-threatening haemorrhage is a serious risk in closed or open trauma to the kidney

Clinical features of closed renal trauma

Superficial soft-tissue bruising can be absent but there is local pain and tenderness.

Haematuria

- Haematuria is the sign of a damaged kidney but it may not appear until sometime after the injury. Profuse bleeding may cause clot colic.



Types of closed renal trauma:-

(a) subcapsular haematoma; (b) laceration; (c) avulsion of one pole; (d) avulsion of the renal pedicle.

Severe delayed haematuria

- Sudden profuse haematuria between the third day and the third week after the accident in a patient who appears to be progressing well is caused by a clot becoming dislodged.

Meteorism

- Abdominal distension 24–48 hours after renal injury is probably a result of retroperitoneal haematoma implicating splanchnic nerves.
- Meteorism is accumulation of gas in the abdomen or the intestine, usually with distension.

Management and treatment

- Conservative watchful treatment of closed renal trauma is usually successful. The possibility of injury to other organs must be considered at an early stage.
 - Blood should be cross-matched for transfusion if there is evidence of hypovolaemic shock or continuing haemorrhage.
 - Intravenous access should be established.
 - The patient should stay in bed while there is macroscopic haematuria and activity must be reduced for a week after the urine clears.
 - Morphine analgesia may be appropriate.
 - Hourly pulse and blood pressure charts must be kept.
 - Antibiotics should be given to prevent infection of the haematoma.
 - Each sample of urine passed should be checked for haematuria and the result charted.
 - Intravenous urography (IVU) or contrast-enhanced CT should be performed urgently to assess the damage to the kidney and to show that the other kidney is normal.
 - Blood should be sent for grouping and serum saved for crossmatching.

Surgical exploration

- Surgical exploration is necessary in less than 10% of closed injuries
- It is indicated if there are signs of **progressive blood loss** or there is an **expanding mass in the loin**.
- The aim is to stop bleeding while conserving as much renal tissue as possible
- A renal arteriogram performed preoperatively can be helpful in framing a strategy for doing this.
- A radiologist may be able to stop the haemorrhage by embolisation if a bleeding vessel can be identified.
- The possibility of damage to other abdominal organs is checked during a transperitoneal approach.
- Release of the tamponading effect of the perirenal haematoma can result in massive haemorrhage and the surgeon must be fully prepared for this.
- When the kidney is ruptured or avulsed from its pedicle, nephrectomy is the only course.
- Small tears can be sutured over a haemostatic sponge or a piece of detached muscle.
- Large single defect in the kidney are best dealt with by passing a tube nephrostomy through the defect and suturing the renal tissue around it.

- If the laceration is confined to one pole of the kidney, partial nephrectomy may be practicable.
- When a solitary kidney is sufficiently damaged to need exploration, it must be repaired. Failing this, the wound is packed firmly with gauze to stop the bleeding in the hope that some renal function may be retained when the ruptured kidney heals.

Clinical features of closed renal trauma (Box)

- There may be no external bruising
- Haematuria indicates that the kidney has been damaged and should prompt careful monitoring of vital signs and urgent investigation
- Delayed haemorrhage may occur days after injury

Surgical treatment in closed renal trauma (Box)

- Exploration of the kidney may be associated with massive blood loss as the haematoma is opened
- Nephrectomy is a possibility so it is important to establish that the contralateral kidney is functioning

Complications

1. Heavy haematuria may lead to clot retention requiring bladder washout through a catheter or a cystoscope.
2. Pararenal pseudohydronephrosis may occur over the course of a few weeks after injury as a result of a combination of complete cortical tear and ureteric obstruction caused by scarring.
3. Hypertension resulting from renal fibrosis may occur long after injury. It is often refractory to medical treatment and nephrectomy may be necessary.
4. Post-traumatic aneurysm of the renal artery is rare.
 - A. There is pain in the loin and a non-tender swelling may be felt if the aneurysm is large.
 - B. Congestion of the parenchyma leads to intermittent haematuria.
 - C. Aortography is diagnostic.
 - D. Excision or nephrectomy is urgently indicated to prevent fatal rupture of the aneurysm.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

رَبِّ اشْرَحْ لِي صَدْرِي (٢٥) وَيَسِّرْ لِي أَمْرِي (٢٦) وَاخْلُفْ عَقْدَةً مِنْ لِسَانِي (٢٧) يَفْقَهُوا قَوْلِي

صدق الله العظيم

السلام عليك يا أبا عبد الله

Muqdad fuad