

67.1 The general method

A blow in a patient's loin can injure his kidneys. Mild kidney injuries are common. They cause a small break in the renal capsule, a small haematoma, and haematuria. More severe kidney injuries tear the renal capsule, pelvis, and calyces; they can tear away the poles of a patient's kidneys, and pulp them, or they can tear his kidneys from their pedicles. Fortunately, you can treat all but the severest kidney injuries conservatively.

After a closed injury the perirenal fascia usually keeps the escaping blood close to the injured kidney, unless the patient is a child. But after an open injury blood tracks in all directions and may enter the peritoneal cavity. If an extensive retroperitoneal haematoma forms, it may be accompanied by ileus.

Haematuria is the major sign; it is usually mild, and stops spontaneously. If a patient passes blood in his urine after an accident, but has no other signs, it is probably coming from his kidneys. If bleeding is more severe, blood may clot in a ureter and block it, so that the passage of blood stops. This may lead you to think that the patient is recovering, when really he is getting worse. Secondary haemorrhage and severe haematuria can occur up to three weeks later, so observe even minor kidney injuries carefully.

Kidney injuries do not usually cause much shock, so if a patient is severely shocked, suspect some other disaster also, such as a rupture of his spleen, or liver.

The loin over a patient's injured kidney is tender, and if he has a large haematoma round it, his loin may be flattened. You will not find a renal haematoma easy to feel in the early stages, because of the tenderness and guarding of the abdominal wall over it. Feel gently, or bleeding may start again.

THE GENERAL METHOD FOR A KIDNEY INJURY

This extends Section 51.3 on the care of a severely injured patient. If the patient also has a severe abdominal injury, this takes precedence over his injured kidney. Treat him conservatively and only operate on the indications listed in the next section (67.2).

THE CONSERVATIVE TREATMENT OF KIDNEY INJURIES

RESUSCITATION Transfuse the patient as necessary.

OBSERVATION Record his pulse every 15 minutes initially, and less often later. Examine his abdomen often for a gradually increasing loin mass.

X-RAYS An intravenous pyelogram is useful, so take one. The only contraindication to it is a low blood pressure which will allow insufficient excretion to give you a useful film. Do a pyelogram as soon as you can, without waiting for haematuria to stop, and before gas in the patient's gut has had time to obscure the films. Give him a double dose of contrast medium, but otherwise take the pyelogram exactly as usual, except that you should not compress his abdomen. Take a control film, followed by films at 5 minutes and 15 minutes; take another film at 30 minutes if you do not see the normal kidney well at 5 and 15 minutes.

Look for: (1) A functioning kidney on the other side, (2) delayed or absent function on the injured side, and (3) blood clots in the calyces. A normal pyelogram does not necessarily mean a normal kidney. You may also see fractures of the transverse processes of the lumbar vertebrae, which are often associated with kidney injuries, and obliteration of the psoas shadow.

URINE Save a sample of all the urine the patient passes, so that you can compare succeeding specimens. If his injured kidney is healing, his urine will change from red to brown. If it becomes red again, further bleeding has started.

FLUIDS AND GASTRIC ASPIRATION Adequate fluid and electrolytes will help him to pass clots without too much pain. Paralytic ileus is a risk in severe cases and may complicate the administration of fluid (10.14).

If there is no indication for an operation, and no distension which might indicate ileus, give him plenty of fluids by mouth.

If you have to operate, or there are signs of ileus, pass a nasogastric tube and aspirate it repeatedly, as long as there is any fluid to aspirate. Give him fluid intravenously.

Keep him quiet in bed for at least a week until all bleeding has stopped, and his pyelogram shows no gross abnormality. If necessary, sedate him thoroughly. Observe him for 3 weeks if necessary.

67.2 Operations for kidney injuries

Should you operate on a patient with an injured kidney? Probably not. If you transfuse him adequately, he will probably recover, even if he has severe haematuria, a large mass in his loin, and a falling blood pressure. This is fortunate because the kidneys are difficult to get at, and trying to ap-

SOME KIDNEY INJURIES

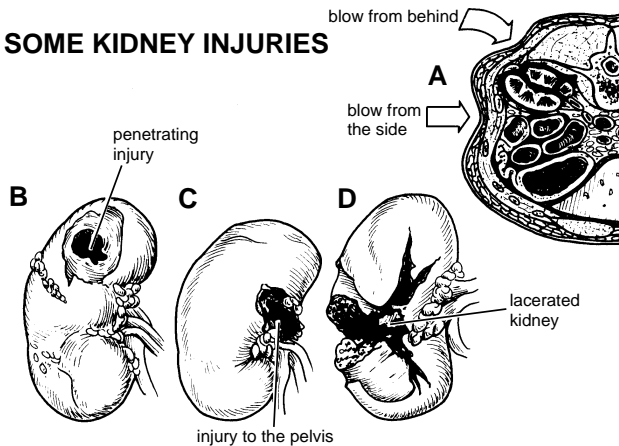


Fig. 67.1: INJURIES OF THE KIDNEYS. A, a blow from the side can drive the kidney against the transverse processes of the lumbar spine; a blow from behind can drive the twelfth rib into it. B, a penetrating injury. C, an injury of the renal pelvis. D, a severe laceration. Adapted from an original painting by Frank H. Netter, M.D. from the CIBA Collection of Medical Illustrations, copyright by CIBA Pharmaceutical Company, Division of CIBA-GEIGY Corporation. With kind permission.

proach them through a mass of blood clot is not easy, even for an expert. The indications for operating are: (1) Persistent haematuria causing a continuing fall in the patient's haemoglobin. (2) A haematoma of the kidney which continues to enlarge. (2) Some open injuries, such as stab or bullet wounds. If possible treat these by packing.

If you have to abandon conservative treatment, you can: (1) Drain a perirenal haematoma. (2) Pack a patient's bleeding kidney. (3) Suture a tear. It is also possible to remove his entire kidney or part of it. This is a heroic task for an experienced operator. For an inexperienced one it is almost impossible, so it is not described here.

Drainage is the simplest operation, and is all that is indicated when there is extensive bleeding and no major damage to the kidney. When a patient's condition is poor, and you do not feel capable of suturing or excising either all or part of his kidney, an easier alternative is to insert a pack, and remove it at 48 hours.

OPERATING ON AN INJURED KIDNEY

INDICATIONS FOR EXPLORING THE KIDNEY *Avoid exploring a patient's injured kidney if you can.* Try to refer those patients who need an operation. if you cannot refer a patient you may have to operate on the indications given above.

EXPOSING THE KIDNEY FROM THE LOIN

POSITION This is critical. Lie the patient on his normal side, with his back near the edge of the table. Flex his hip and his knee on the side next to the table. Extend his upper leg and place a soft pillow between his legs. if your table does not have a kidney bridge to extend his loin, place a large sandbag under his normal loin. If possible, support his upper arm. This will relieve the pressure on his chest, and help to hold him in place.

Find your landmarks by feeling his vertebral column, his iliac crest, and his twelfth rib.

CAUTION ! Don't mistake his twelfth rib for his eleventh or you will incise too high and open his pleura. Sometimes the twelfth rib is very short, so examine his ribs on the films from his pyelogram.

Start the incision just medial to the angle between his erector spinae muscle and his twelfth rib. Deepen it to show the muscles. The tissue planes will be more easy to identify if you infiltrate them with adrenaline and saline.

In the upper half of the incision, cut latissimus dorsi in the line of the incision. In the lower half of the incision cut the patient's external oblique almost in the line of its fibres.

The next layer is the internal oblique. Cut this almost across the line of its fibres.

If you see his twelfth thoracic nerve, try not to cut it. Avoid clamping it with forceps when you clamp the artery that runs with it.

Place retractors under the edges of the incision, and you will see his transversals muscle anteriorly, attached to the dorsolumbar fascia posteriorly.

Incise the dorsolumbar fascia first, and use a gauze swab to push the peritoneum lying under transversalis forwards and laterally.

Complete the division of the dorsolumbar fascia and transversalis muscle in the line of the incision.

Underneath you will find the patient's perirenal fascia and the fat round his kidney.

DECIDING WHAT TO DO NEXT Base your decisions on the following indications.

Drainage There is a mass of blood clot which may be infected over the kidney.

Packing (1) You are not sure if the patient has a normal kidney on the other side, or not. (2) He is in such poor condition that he will not stand a further operation. (3) You are inexperienced, and have little help and few facilities.

Suturing tears Linear tears which can be sutured. **DRAINING A PERIRENAL HAEMATOMA** Avoid the patient's peritoneal cavity by approaching the mass well to the side. Incise its most fluctuant part. Scoop out the blood clot, then either pack the area or close it with a wide corrugated rubber drain.

PACKING A RUPTURED KIDNEY Clear the blood clot from the patient's perinephric space. Put one roll of gauze on the medial side of his kidney, and another on the lateral side. Fill the wound with a third roll of gauze. Tie them together so you can later pull them all out together.

Bring the skin edges together loosely, watch him carefully, and transfuse him as necessary.

If he has severe haematuria, or excessive oozing, reopen the wound immediately.

48 hours later, remove the packing in the theatre. His kidney will probably be dry and not bleeding. Insert a drain.

SUTURING A RUPTURED KIDNEY Pass catgut mattress sutures about 5 cm through the kidney tissue. Don't tie them too tightly or they will cut out, or strangulate the renal tissue. Tighten the knot steadily, and avoid a sudden jerk.

Put three further stitches through the kidney, one at the middle of the tear and one at either end. if you cannot control bleeding insert a pack. Alternatively, use haemostatic gauze.

Take a small corrugated drain down to the patient's renal pelvis, and leave it protruding from the wound.