Ureteric injuries

Rupture of the ureter

- Result of a hyperextension injury of the spine.
- The diagnosis is rarely made until there is swelling in the loin or iliac fossa associated with a reduction of urine output.
- An excretion urogram or contrast-enhanced CT shows extravasation of contrast from the injured ureter.

Injury to one or both ureters during pelvic surgery

- Occurs most often during vaginal or abdominal hysterectomy when the ureter is divided, ligated, crushed or excised, usually inadvertently.
- Pre-emptive ureteric catheterisation prevents such accidents as the catheters make it easier to identify the ureters.

Injury recognised at the time of operation

- Ureterovesical continuity should be restored unless the patient's condition is poor.
- If the patient's condition is poor, then ligation of the proximal ureter and temporary percutaneous nephrostomy is the best course until the patient is well enough for a repair.

Injury not recognised at the time of operation

Unilateral injuries

- There are three possibilities:

• ***No symptoms***. Secure ligation of a ureter may simply lead to silent atrophy of the kidney. The injury may be unsuspected until the patient undergoes urological imaging some time later.
• ***Loin pain and fever***, possibly with pyonephrosis, occur with infection of the obstructed system. Urography shows no function, which will be permanent unless the obstruction quickly relieve by inserting a percutaneous nephrostomy.
• **A *urinary fistula*** develops through the ***abdominal or vaginal wound***. The urogram or contrast-enhanced CT shows extravasation with or without obstruction of one or both ureters. Nephrostomies may be inserted and repair postponed until oedema and inflammation have subsided. The traditional delayed repair leaves the patient incontinent.
Early repair is safe provided that the patient is fit for surgery.

Bilateral injury

- Ligation of both ureters leads to anuria. Ureteric catheters will not pass and urgent relief of obstruction by nephrostomy or immediate surgery is essential.

Repair of the injured ureter

- If the cut ends of the ureter can be apposed without tension, they should be joined by a spatulated anastomosis over a double pigtail catheter.

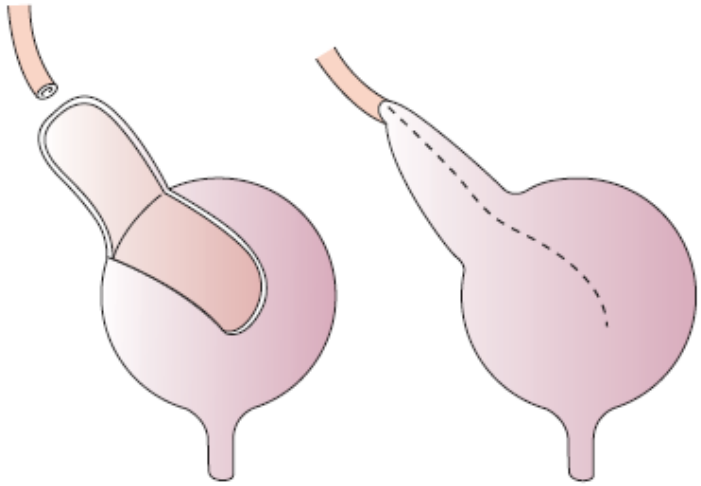
- If it is possible to insert a stent endoscopically past a partial ureteric obstruction, an open repair may be avoidable.
- If the division is very low down, the bladder may be hitched up so that the ureter can be re-implanted into it. Extra length may be obtained by mobilising the kidney.
- In the ***Boari operation***, a flap of bladder wall is fashioned into a tube to replace the lower ureter.
- The disadvantage of implanting the ureter end to side into the contralateral ureter (a transureteroureterostomy) is that it risks converting a unilateral injury into a bilateral one.
- Nephrectomy may be the best course when the patient's outlook is poor and the other kidney is normal.
- When conservation of all renal tissue is vital, replacement of the damaged ureter by a segment of ileum is necessary.

Ureteric injury during operation

■ The most common cause of injury to the ureters is surgical trauma during hysterectomy or other pelvic surgery

■ Preoperative catheterisation of the ureters makes them easier to protect during surgery

■ Injuries discovered at the time of surgery should be repaired immediately



Boari operation: a strip of bladder wall is fashioned into a tube to bridge the gap between the cut ureter and the bladder

Table: Methods for repairing a damaged ureter

If there is no loss of length	Spatulation and end-to-end anastomosis without tension
If there is little loss of length	Mobilise kidney Boari operation

If there is marked loss of length	Transureteroureterostomy Interposition of isolated bowel loop or mobilised appendix Nephrectomy

Repair of the injured ureter (Box)

When surgical damage to a ureter is discovered postoperatively:

■ Repair need not be delayed if the patient is fit

■ A variety of techniques may be needed to ensure successful repair, and surgery should be performed by a urologist

بسم الله الرحمن الرحيم

رَبِّ اشْرَحْ لِي صَدْرِي (٢٥) وَيَسِّرْ لِي أَمْرِي (٢٦) وَاحْلُلْ عُقْدَةً مِنْ لِسَانِي (٢٧) يَفْقَهُوا قَوْلِي

صدق الله العظيم

د مقداد فؤاد

السلام عليك يا أبا عبد الله