Pelviureteric junction obstruction

Incidence unknown – often silent
Male > females
Left > right
Peak presentation 20-40yrs

Aetiology

Controversial - has been a/w intrinsic and extrinsic causes:

(i) Intrinsic

Functional stricture	Impaired peristalsis due to **aperistaltic segment**. Normal circular fibres replaced by longitudinal muscle or fibrous tissue Tortuosity and kinking previously thought to be a cause of ureteric obstruction: however now believed to be 2' to intrinsic stricture
Anatomical stricture	
Congenital	Less common vs. functional. Abnormal musculature with high collagen content on EM
Traumatic	2' to stone or previous ureteroscopy

(ii) Extrinsic

Crossing vessel	40% patients with PUJO cf. 20% normal population. Probably coincident to intrinsic lesion (Lawler 2005), although Keeley reported improved function in patients with division of vessels alone (1996)
External cause	RPF, sarcoma, lymphoma etc.

Presentation (in adulthood)

Asymptomatic
Loin pain
Haematuria
UTI/pyonephrosis
Dietl's crisis
    Severe loin pain a/w decompensation of PUJO, often after fluid load
Hypertension
Renal impairment

Diagnosis

Ultrasound
IVU +/- diuretics
CT urogram
    3D planning extremely helpful, esp for lap and minimally invasive approaches
Diuretic renogram
    May be F-15, F0 or F+15
    < 15% function on affected side indicates non-salvageability
    Value of F-15 emphasised by English et al 1987

Whitaker study (1973)
- Rarely performed
- Invasive requiring nephrostomy
- Catheter and infusion at 10ml/min into renal pelvis
- Pressure* < 15cm unobstructed
  15-22cm equivocal
  > 22cm obstructed
- * Renal pressure minus bladder pressure
- Particularly valuable in patients with very large hydronephrosis or those with severe renal impairment – avoids reliance on GFR for excretion

Management

Indications for intervention
- Symptoms
- Overall renal impairment
- Progressive deterioration of affected unit
- Recurrent UTI
- Development of calculi
- ?New-onset hypertension

(i) Conservative Mx
- Legitimate in the elderly and in asymptomatic patients without renal impairment, UTI, calculi or hypertension
- Natural history unknown – must explain (and document) the theoretical risk of life-threatening pyonephrosis

(ii) Open pyeloplasty
- **Open pyeloplasty (usually dismembered) gold standard**
- Dismembered preferable as allows complete excision of the affected ureteric segment, easy reduction pyeloplasty and transposition anteriorly – only method recommended for crossing vessels
- Dismembered pyeloplasty a/w 95% resolution of symptoms and 91% patency on IVU (probably higher on diuretic renography)
- Multiple different techniques reported (see appendix)

Anderson-Hynes	dismembered standard approach
Culp-deWeerd	large renal pelvis
Foley V-Y plasty	high insertion of PUJ
Fenzerplasty	Heineke-Miculicz

- Irrespective of technique, similar surgical principles
  - Good tissue handling
  - Prevention of ischaemia
  - Tension-free anastomosis
  - Watertight
  - Funnel-shaped anastomosis
  - Dependent drainage

(iii) Laparoscopic pyeloplasty
- First performed by Schuessler 1993

Equivalent success rates to open pyeloplasty with reduced morbidity, blood loss, inpatient stay and recovery
4 techniques reported
- Standard transperitoneal
- Anterior extraperitoneal
- Retroperitoneal
- Robotic

NB. For all patients important to confirm diagnosis by performing cystoscopy and RPG prior to placement in lateral decubitus position
Outcome >90% success rates on follow-up
70% of failures successfully Rx with endoscopic procedures

(iv) Endoscopic management
Originally described by Ramsay in 1984
Multiple techniques
- Retrograde
  - Accusize balloon
  - Laser endopyelotomy
- Percutaneous antegrade laser endopyelotomy
  - Good for concomitant pelvicalyceal stones and short stricture
  - Must confirm diagnosis by prior cystoscopy and RPG before turning into lateral decubitus position

May have a role in some patients
Contraindications
- Long stricture > 2cm
- Active infection
- Untreated coagulopathy

Minimally invasive; a/w shorter IP stay and recovery
Overall outcomes do not approach those of open surgery: **67% long-term patency rates; most recurrences within 2.5 yrs** (Albani 2004)
Outcome worse in patients with crossing vessel (make incision posterolaterally)

Appendix

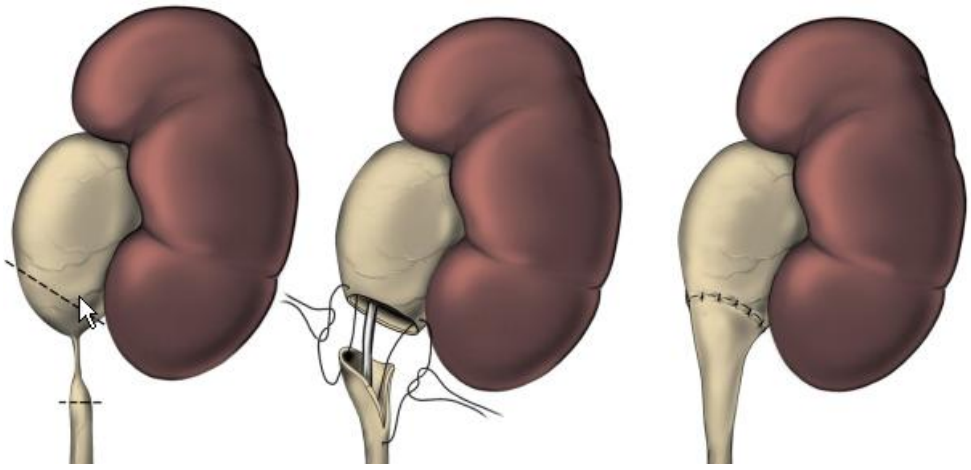
Antegrade endopyelotomy – technical consideraions
Posterior mid-pole or superior-lateral calyx
Wire across PUJ
Lateral incision devoid of crossing vessels
JJ stent insertion
Nephrostomy or tubeless depending on surgeon's preference and degree of bleeding at time of PCNL
Outcome – overall 67-73% long-term success (slightly higher reported in US centres). Outcomes only ~50% in those with combination of crossing vessel and moderate hydronephrosis. No difference for primary or secondary procedures.

Cautery ballon wire endopyelotomy
Accusize
Allows endopyelotomy under standard urology set-up
Thus performed under flouro; no direct visualisation
Contraindications
- Long stricture
- Stones
- Bleeding diathesis

Crossing vessels may be injured if cutting wire strays from a lateral attitude, and may impair outcome
Only 32-63% success rate in contemporary series

Optical retrograde endopyelotomy
Cold knife, cutting diathery or laser incision
Contraindications as above
?pre-op stenting
Drainage of renal pelvis
Semi-rigid URS with 200um or 365um laser fibre
Posterolateral incision
Outcome 75% patency rates at 5 years

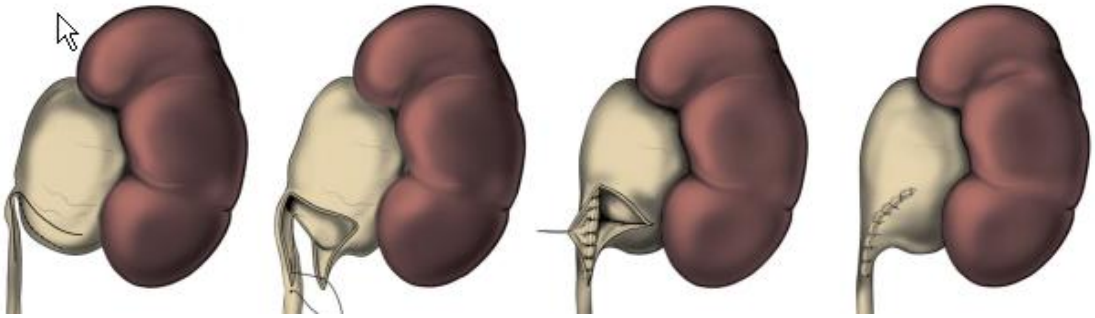
Dismembered pyeloplasty



Foley VY plasty

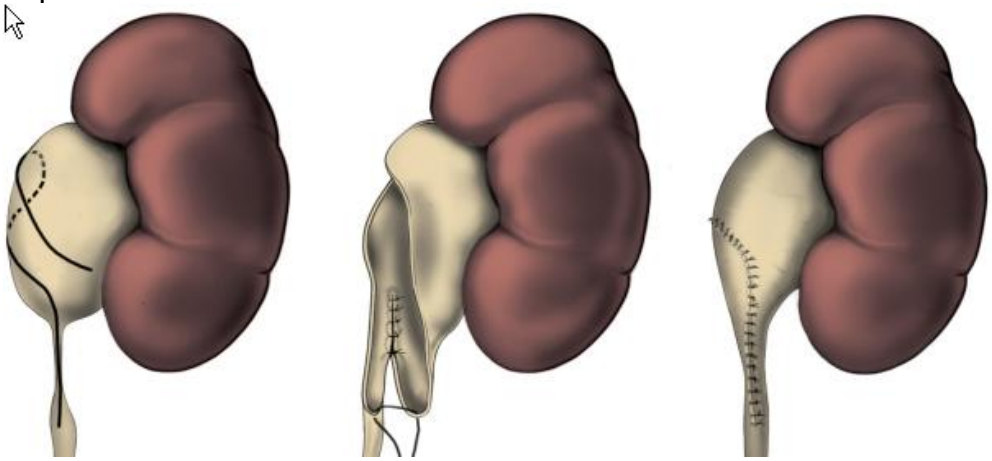
Good for high insertion of PUJ

The base of the V is positioned on the dependent, medial aspect of the ipsilateral renal pelvis and the apex at the UPJ. The incision from the apex of the flap is along the lateral border of the ureter.



Culp-deWeerd pyeloplasty

Spiral flap useful for patients with large extrarenal pelvis and already dependent ureter



Other techniques

(i) Scardino-Thompson pyeloplasty

Box-shaped pelvis with dependent ureter – uncommon

(ii) Davis intubated ureterostomy

Long ureteric stricture
Presumably failed ureteric dilatation
Nephrostomy drainage
Culp flap with 'open' incised ureter below
Allowed to heal by secondary intention

(iii) Ureterocalycostomy

Davis intubated ureterotomy

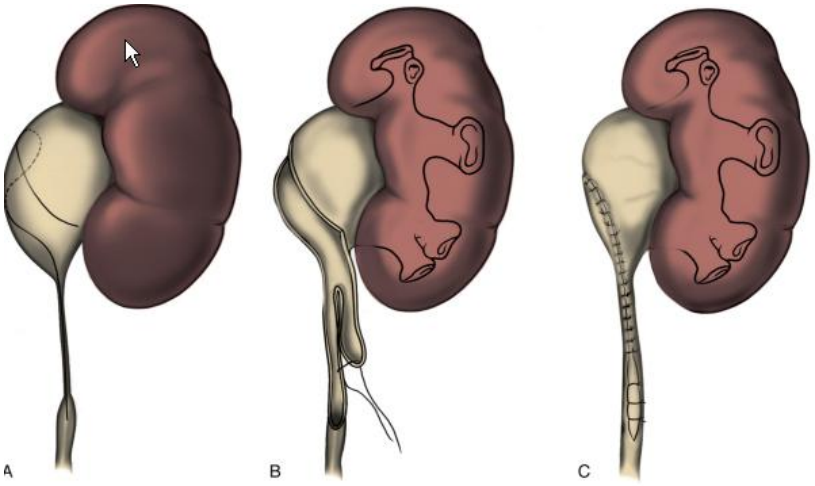


Figure 38-17 A, Intubated ureterotomy may be of value when a UPJ obstruction is associated with extremely long or multiple ureteral strictures. A spiral flap is outlined and developed as described in Figure 38-15 . The ureterotomy incision will be carried completely through the long strictured areas or through each of the multiple areas of stricture. **B,** The flap is developed, taking care to use minimal dissection of the ureter to preserve its blood supply. In contrast to uncomplicated repairs, nephrostomy tube drainage is utilized routinely. A self-retaining, soft, inert internal ureteral stent is then placed and positioned proximally in the renal pelvis or lower infundibulum and distally in the bladder. The apex of the flap is then brought as far down as possible over the stent on the ureterotomy, and the flap is closed with interrupted or running absorbable suture. **C,** The distal aspect of the ureterotomy is left open to heal secondarily by ureteral regeneration. A few fine absorbable sutures may be loosely placed to keep the sides of the ureter in apposition to the stent.