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
Pelvi-ureteric junction obstruction

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
  - Culp-deWeerd: standard approach
  - Foley V-Y plasty: large renal pelvis
  - Fenzerplasty: high insertion of PUJ
  - 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 considerations
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 balloon 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 diathermy 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 18-17** A, Intubated ureterotomy may be of value when a UJO obstruction is associated with extremely long or multiple uretal strictures. A split flap is outlined and developed as described in Figure 18-15. 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 avoid minimal dissection of the ureter to preserve its blood supply. In contrast to uncomplicated repairs, nephrostomy tube drainage is utilized routinely. A soft, retracting, soft, and internal ureteral stent is then placed and positioned proximally in the renal pelvis or lower intralobular and distally in the bladder. The apex of the flap is then brought as far down as possible over the stent in 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 brought through to close the stitcal at the ureter in association to the stent.