TUTORIALS

PG Residency
Urology

Smart Notes. Better Scores.

Defining the Obstructed Kidney: PUJO Mechanics

Definition:

- Functional impairment of urinary transport at the kidney-ureter junction leading to obstruction.

Diagnostic Standard:

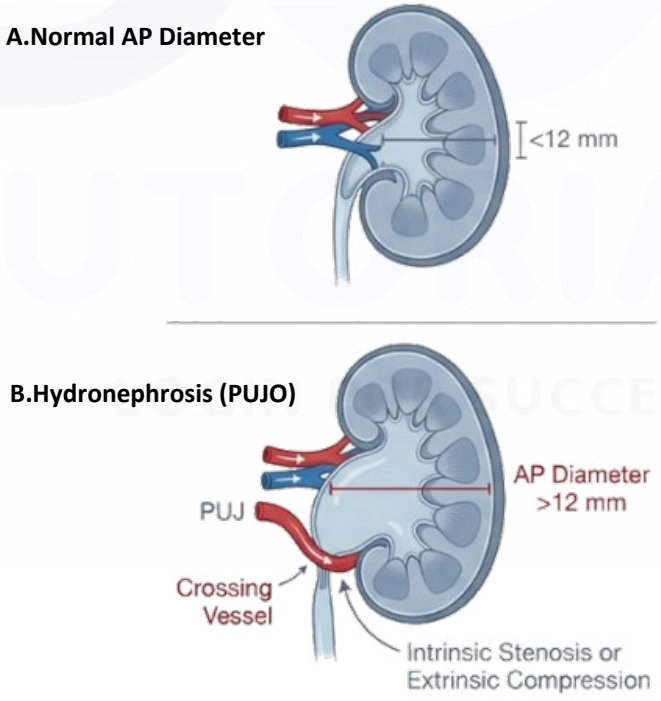
- Functional impairment of urinary transport at the kidney-ureter junction leading to obstruction Hydronephrosis defined as Antero-Posterior (AP) diameter >12 mm of the intrarenal pelvis on Ultrasound (USG).

Congenital Etiology:

- **Intrinsic Defects** :Abnormal smooth muscle/peristalsis, decreased interstitial cells of Cajal, cytokineoverproduction, or mucosal valves.
- **Anatomical:** Crossing vessels present in 63o/o of PUJO cases (vs. 20% in normal kidneys).

Acquired Differential:

- Stones, strictures, neoplasms, post-op fibrosis.



Pathogenesis and Clinical Presentation

Mechanisms of Obstruction

Intrinsic Stenosis

Luminal narrowing due to muscle defect.

Crossing Vessel

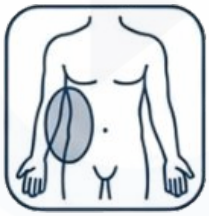
Duplex Systems: Lower moiety commonly obstructed.

Clinical Timeline Infographic

Neonate/Infant

Flank Mass (Prenatal USG finding)

Child/Adult



- **Dietl's Crisis** (Intermittent Pain)
- Flank pain (e.g., left loin), Nausea, Vomiting
- Rare: Hematuria, Hypertension

Intraoperative Reality
Surgeons typically encounter a grossly dilated pelvis.

The Diagnostic Hierarchy: Anatomy and Function

Diagnostic Funnel

Screening

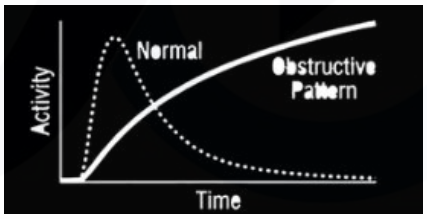
Ultrasound (USG)
Detail: First-line screening modality

Anatomical Definition

ComputedTomography(CT)
Detail: Assesses anatomy, parenchymal thinning, and identifies crossing vessels

Functional Confirmation

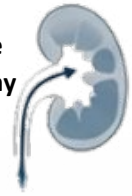
Renogram Curve



Diuretic Renography (MAG-3)
Detail: MAG-3 preferred over DTPA. Assesses split renal function and drainage dynamics.

Side Note Box

Retrograde Pyelography (RGP)



Detail: Performed intraoperatively to visualize anatomy dynamically immediately prior to incision.

Endourological Management: Endopyelotomy

Technique Indication: Short-segment PUJO.

Approaches:

- Percutaneous (antegrade) or Retrograde (via urethra).

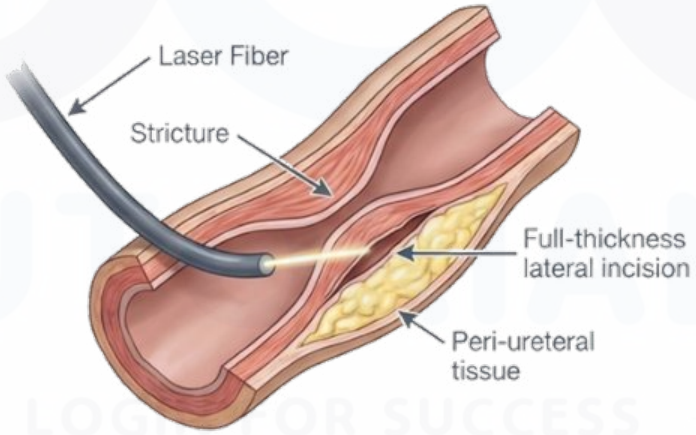
The Procedure:

- Flexible scope inserted via urethra.
- Full-thickness lateral incision using hook knife or Holmium laser (200µ fibre).
- Validation: Confirm patency via contrast extravasation.

Post-Op:

- Placement of 14x7 Fr stent. Follow-up imaging at 6 and 12 months.

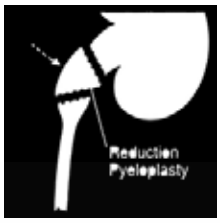
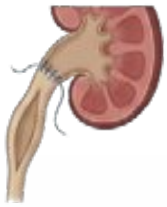
Visual Illustration:



Contraindications:

- Long strictures(>2 cm)
- Active infection
- Coagulopathy.

The Gold Standard: Anderson-Hynes Dismembered Pyeloplasty

1. Excision	2. Spatulation	3. Reduction	4. Anastomosis
			

Indications:

- Redundant pelvis, high ureteral insertion, or tortuous ureter.

Post-Operative Care:

- Stent placementrequired; removed after 4-6 weeks.

Limitations:

- Not suitable for long/multiple strictures or intrarenal pelvis.

Advanced Reconstruction: Minimally Invasive & Flap Techniques

Laparoscopic & Robotic Approaches:

- Preferred Route: Transperitoneal (familiar anatomy, better working space).
- Outcomes: Shorter hospital stay, lower complications, high success rate (>95%).

Flap Repair Matrix

Foley's Y-V Plasty

Indication: High ureteral insertion.

Spiral Flap (Scardino-Prince)

Indication: Long proximal ureteric strictures.

Vertical Flap

Indication: Box-shaped pelvis.

Priapism: Definition and Classification

Definition

- Full or partial erection lasting >4 hours without sexual stimulation or persisting beyond climax.

Type Ischaemic	Alternate Name	Key Characteristics
Non-Ischaemic	Low-flow, Veno-occlusive	**Medical Emergency.** Painful rigid, hypoxic. Painless, tumescent (semi-rigid). Often post-trauma.
	High-flow, Arterial	Intermittent, repetitive episodes. Strongly associated with Sickle Cell Disease.
Stuttering	Recurrent Ischaemic	

Ischaemic Priapism: The Veno-Occlusive Emergency

Clinical Data

- Helvetica Now Display Bold

Pathophysiology:

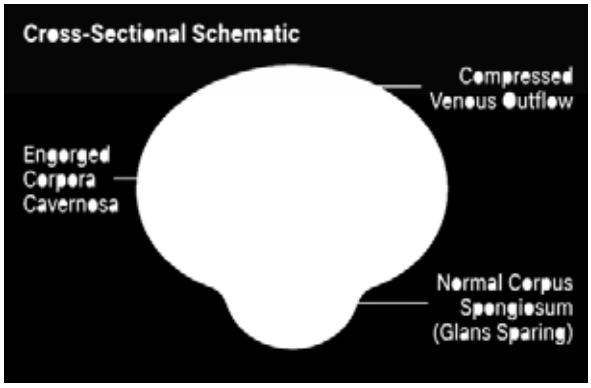
- Decreased cavernous arterial inflow-> Stasis -> Hypoxia/Hypercapnia/ Acidosis.

Clinical Presentation:

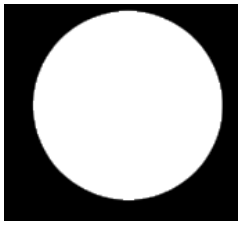
- Painful, rigid erection.
- Rigid shaft with a **soft glans (sparing).**

Diagnostic Markers:

- Cavernous Blood Gas: $\downarrow p0_2$, $\uparrow pC0_2$, $\downarrow pH$.
- Doppler: Demonstrates absence of arterial inflow.



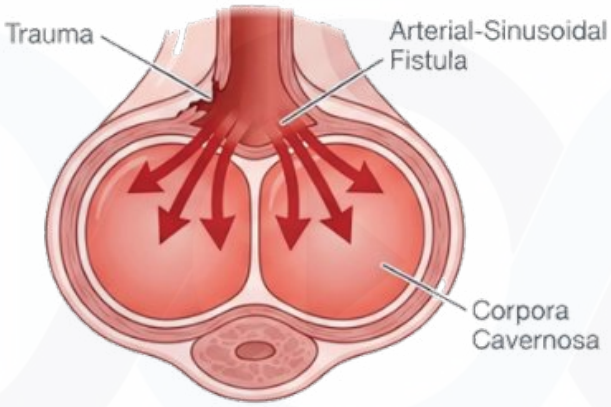
Urgency Graphic:



Critical Window: <36 Hours
Risk of irreversible fibrosis and potency loss.

High-Flow and Stuttering Variants

Non-Ischaemic (High-Flow)



- **Etiology:** Trauma (Straddle injury) Arterial - Sinusoidal Fistula.
- **Features:** Painless, non-rigid tumescence
  Normalblood gas
- **Management:** Conservative (Observation), Compression, or Selective Embolization.

Stuttering Priapism

- **Profile:** Recurrent ischaemic episodes, often starting in childhood.
- **Key Association:** Sickle Cell Disease.
- **Triggers:** Nocturnal erections, dehydration, fever.

Etiology: Pharmacologic and Systemic Triggers

Priapism

Drug-Induced
(Major Contributors)

- **Alpha-blockers:** Prazosin,Tamsulosin
- **Psychotropics:** Antidepressants (Sertraline, Bupropion), Anti psychotics (Phenothiazines)
- **Recreational:** Cocaine, Marijuana, Alcohol
- **ED Meds:** PDE-5 inhibitors (esp. with recreational drugs)

Hematologic

Sickle Cell Disease

- (Most common)
- Leukemia (AMUALL)
- Multiple Myeloma
- G6PD Deficiency

Other Causes

- **Trauma:** Straddle injury, pelvic trauma
- **Neoplastic:** Metastatic penile carcinoma (prostate/bladder origin)
- **Neurogenic:** Spinal

Sickle Cell Disease: The Molecular Mechanism of Stasis

Hemolysis		NO Scavenging	Vascular Effect	Clinical Consequence
	Release of Free Hemoglobin			
	Clinical Red	**Free Hb binds Nitric oxide** Arginase depletes L-arginine (No substrate)		
Rupture of sickled RBCs		↓ Nitric Oxide Availability	Impaired Smooth Muscle Relaxation	Venous Outflow Obstruction & Stasis

Clinical Note: Stuttering priapism affects 1 /3 of males with SCD. Triggers include sleep, cold, and dehydration.

Iatrogenic Causes and Clinical History

Intracavernosal Risk Stratification:

Agent	Risk of Prolonged Erection	Notes
Papaverine	High (~35%)	Monotherapy risk is significant.
Trimix	Moderate	Papaverine + Phentolamine + PGE1.
PDE-5 Inhibitors	Low	Risk increases if combined with recreational drugs or SCD.

Clinical Evaluation Protocol

Definitions

- Prolonged Erection: >4 hours.
- Priapism: Clinically >4 hours (Trial definition >6 hours).

History Checklist:

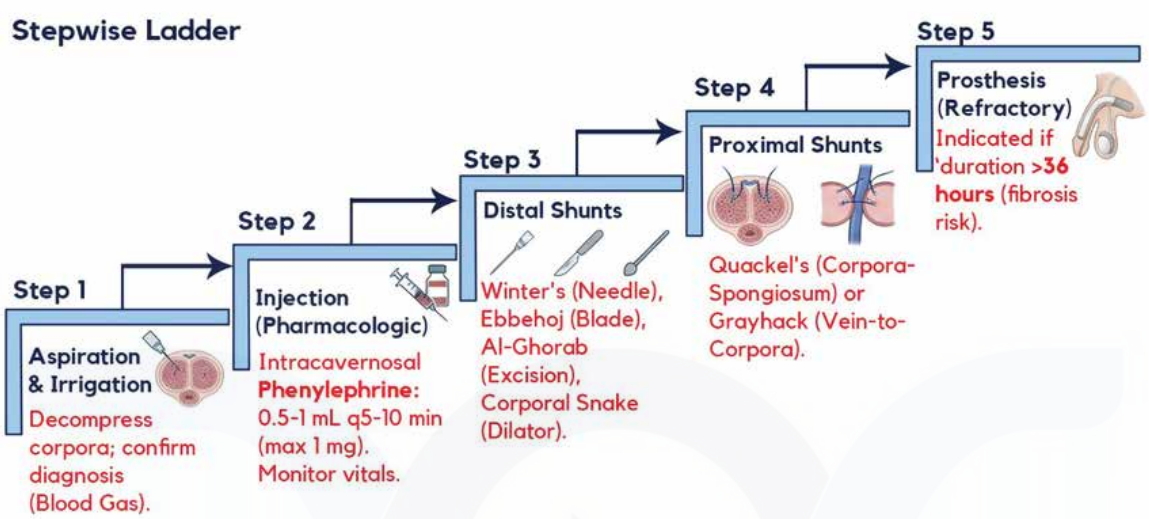
- Duration of erection?
- Presence of severe pain?
- Prior episodes (stuttering)?
- Drug use (Rx, Recreational, ED meds)?
- History of Trauma or Sickle Cell?

Iatrogenic Causes and Clinical History

Feature	Ischemic Priapism	Non-Ischemic Priapism
Rigidity	Fully rigid shaft, soft glans	Tumescent (not fully rigid) Absent
Pain	**Severe**	Bright red blood
Blood Appearance	Dark, viscous **"Crankcase oil"**	Normal
pH	Acidosis **(<7 .25)**	Normal
pO2	Hypoxia **(<30 mmHg)**	Normal
pCO2	Hypercapnia **(>60 mmHg)**	High flow/ Fistula visible
Doppler US	No arterial inflow	

Ischemic Management Algorithm: Aspiration to Shunting

Modern Clinical Atlas

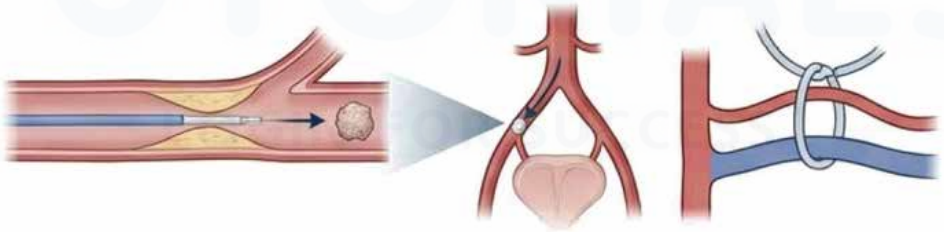


Managing Non-Ischemic and Stuttering Priapism

Modern Clinical Atlas

Non-Ischemic Management

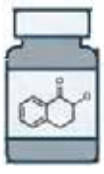
- Strategy: Often conservative due to spontaneous resolution.
- Interventions
  - Site-specificcompression.
  - Selective Arterial Embolization (Risks: Gluteal ischemia, ED).
  - Fistula Ligation.



Stuttering Priapism Management

- Goal: Prevention of ischemic recurrence.

Hormonal:
- GnRH agonists,
- Antiandrogens (Ketoconazole)



Non-Hormonal:
- Oral alpha-agonists (Pseudoephedrine),
- Baclofen (GABA agonist)

Paradoxical Therapy:
- Low – dose **PDE – 5 Inhibitors** (Sildenafil/Tadalafil) To downregulate NO pathway and nocturnal cycles.

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