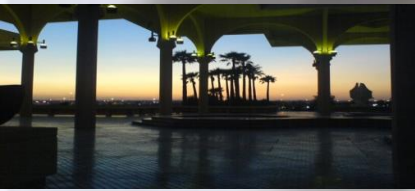


Urolithiasis

Mohammad Alomar MD, FRCSC
Assistant professor of surgery
Consultant Urologist



Tutorial Objectives

- Quick epidemiology
- Clinical presentation
- Investigations and Imaging
- Treatment options
- Prevention

Quick Epidemiology

- Life time renal stone expectancy 20.1%
- Chance of recurrent episode (if untreated) 50%
- Recurrence ↓ by 50% after Rx.
- Because of these factors counselling is important
 - Urologist
 - Nephrologist

Clinical presentation

- Conservative
 - Small stone, < 5mm
 - Analgesia
 - Hydration
 - Antiemetic
 - Medical expulsive therapy (alpha blockers)

Clinical presentation

- A 60-year-old male presented with Rt flank pain for 2 days.



- Next?

Differential Diagnosis

- **Radiculitis (pseudo-renal)**
- **Leaking abdominal aortic aneurysms**
- **Pneumonia**
- **Myocardial infarction**
- **Ovarian pathology (e.g., twisted ovarian cyst)**
- **Acute appendicitis**
- **Testicular torsion**
- **Inflammatory bowel disease (Crohn's, ulcerative colitis)**
- **Diverticulitis**
- **Ectopic pregnancy**
- **Burst peptic ulcer**
- **Bowel obstruction**

History

- Pain
- Urinary symptoms
- Eliminate differential diagnosis



Physical Examination

- General examination
- Abdominal examination
- Flank tenderness



Investigations and Imaging

Always be systematic and order what you need to reach a diagnosis and or change your management.

Think (Urine < Blood, imaging, others)

- Urine Dipstick
- Urinalysis
- Urine C&S
- Renal Profile
- Complete Blood count

Management of Renal Stones

- Indication for intervention
 - Solitary kidney / bilateral ureteric obstruction
 - Renal impairment
 - Pyelonephritis
 - Intractable pain

Results

Results	29/03/2020 09:50 AST
UA Analysis	
<input type="checkbox"/> UA Spec Grav	1.016
UA Bili	Negative
<input type="checkbox"/> UA pH	5.0
UA Urobilinogen	Normal
UA Blood	Trace (0.3)
UA Glucose	Negative
UA Ketones	Negative
UA Protein	Trace (10-20)
UA Nitrite	Negative
UA Leuk Est	Negative
<input type="checkbox"/> UA WBC	3
<input type="checkbox"/> UA RBC	5

Results	29/03/2020 09:50 AST
Routine Chemistry	
<input type="checkbox"/> ALT	19.0
<input type="checkbox"/> AST	14 (L)
<input type="checkbox"/> Albumin	39.08
<input type="checkbox"/> Alk Phos	62
<input type="checkbox"/> BUN	4.3 *
<input type="checkbox"/> Creatinine Lvl	130 (H)
<input type="checkbox"/> Bili Direct	2.93
<input type="checkbox"/> Bili Indirect	9
<input type="checkbox"/> Bili Total	12.30
<input type="checkbox"/> CO2	26
<input type="checkbox"/> Calcium	2.47 *
<input type="checkbox"/> Chloride	103
<input type="checkbox"/> Glucose	8.65 * (H)
<input type="checkbox"/> Potassium	4.6 *
<input type="checkbox"/> Sodium	138 *
<input type="checkbox"/> Total Protein	77 *
<input type="checkbox"/> GGT	25
<input type="checkbox"/> Corr Calcium	2.49 *
<input type="checkbox"/> Phosphorus	1.05 *
<input type="checkbox"/> Osmolality	289
<input type="checkbox"/> Glucose Fasting	
<input type="checkbox"/> Hgb A1c	
<input type="checkbox"/> Lactic Acid	
<input type="checkbox"/> Uric Acid	

Results	29/03/2020 09:50 AST
General Hematology	
<input type="checkbox"/> WBC	5.200
<input type="checkbox"/> RBC	6.0
<input type="checkbox"/> Hgb	129.0 (L)
<input type="checkbox"/> Hct	39.8 (L)
<input type="checkbox"/> MCV	66.8 (L)
<input type="checkbox"/> MCH	21.6 (L)
<input type="checkbox"/> MCHC	323.0
<input type="checkbox"/> RDW	15.8 (H)
<input type="checkbox"/> Platelet	190.0

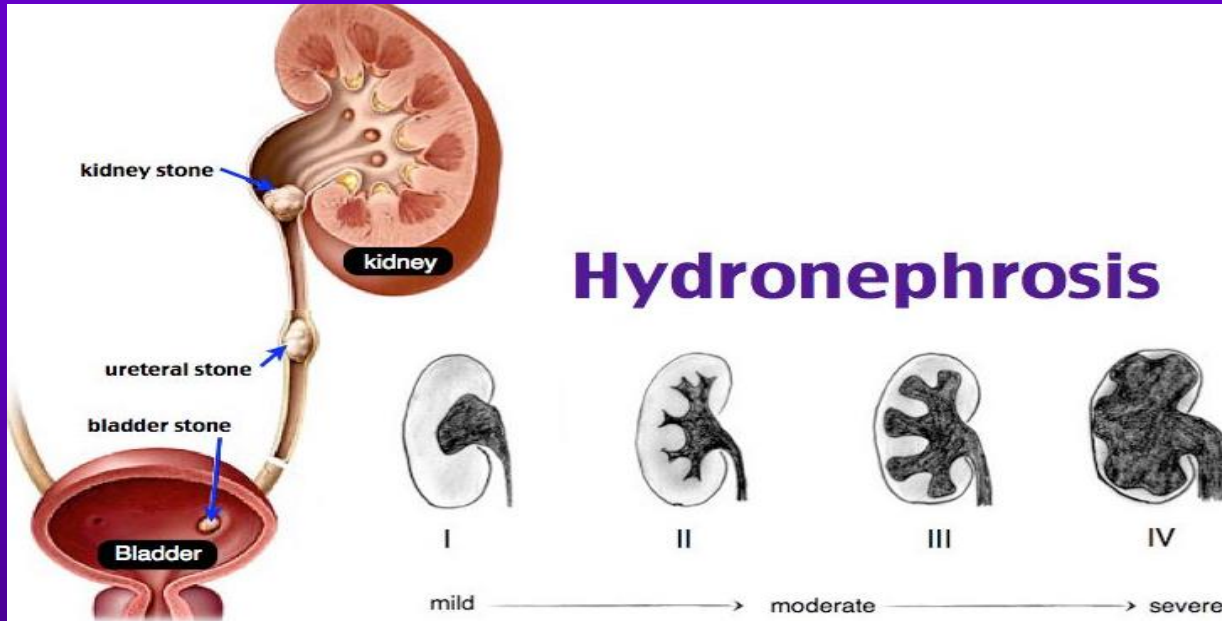
Results	29/03/2020 09:50 AST	11/11/2019 08:42 AST
Bacteriology		
Urine Culture	NEG	NEG

Coagulation	
<input type="checkbox"/> PT	13.40
<input type="checkbox"/> INR	0.95
<input type="checkbox"/> APTT	27.30

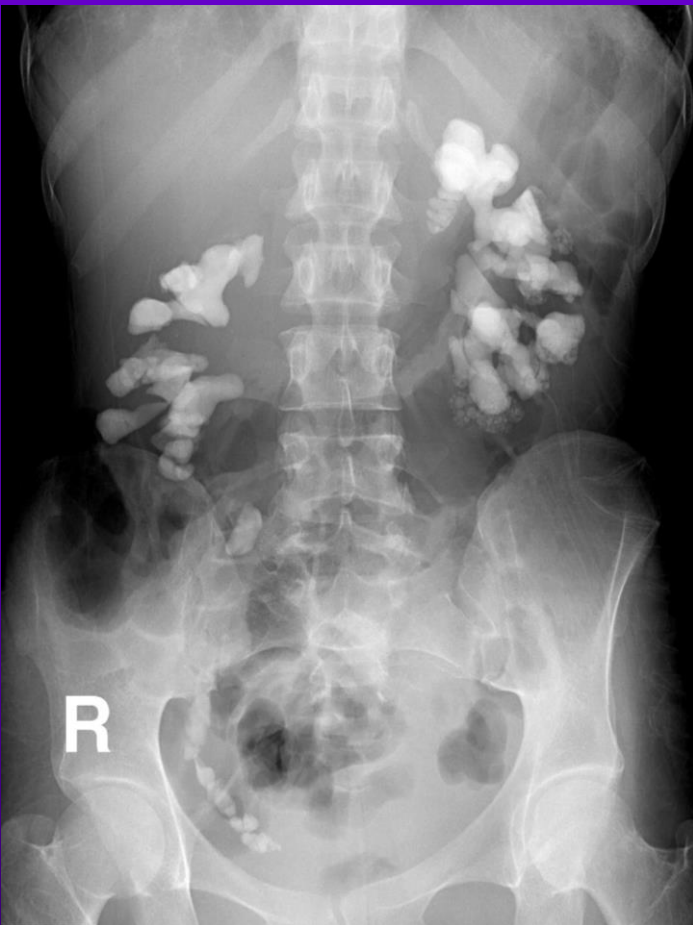
Imaging

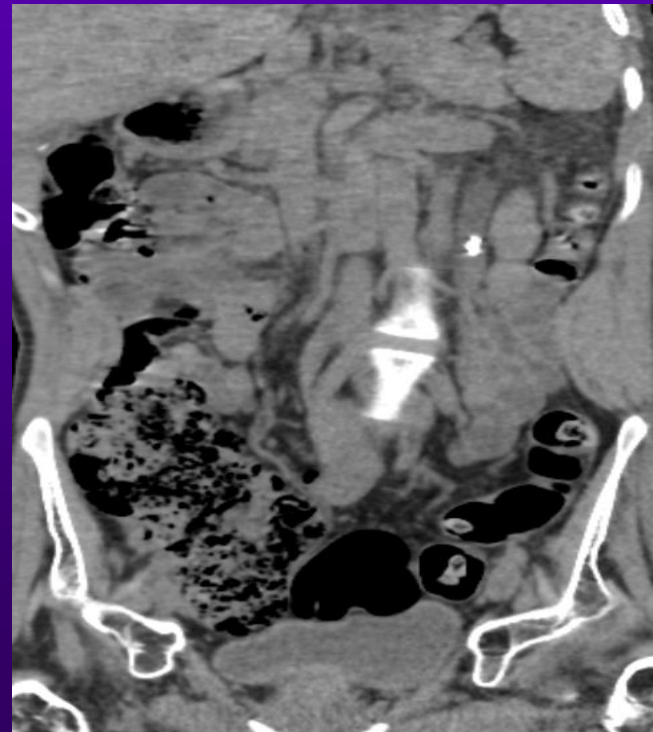
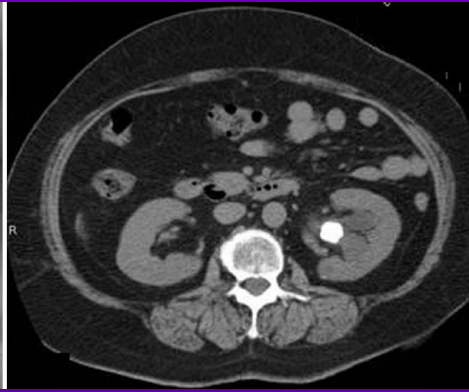
- Which one to do?
- U/S
- KUB
- CT

U/S

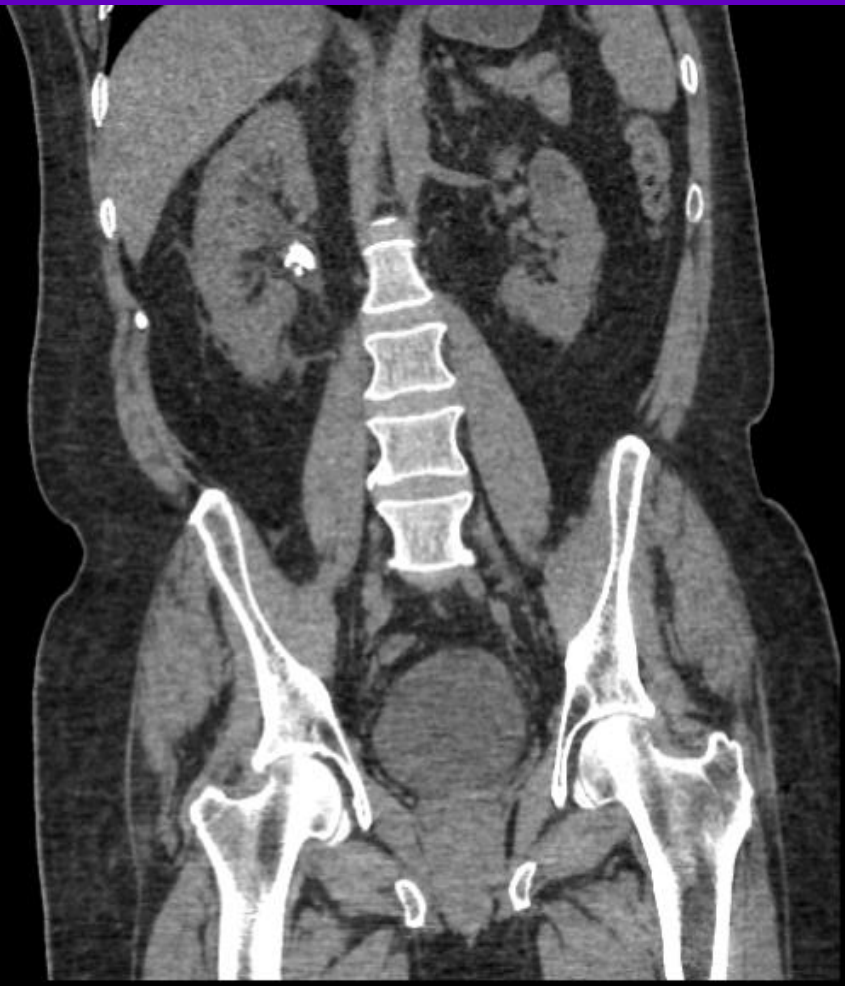


KUB





Our Patient result



Treatment

- Hydration
- Analgesia
- Medical expulsion therapy
- When do you admit/intervene?

Indications for Admission

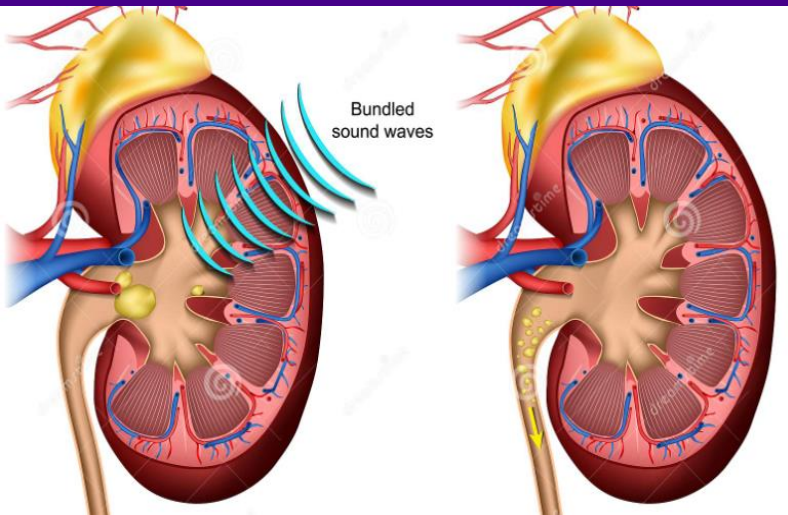
- Infection
- Renal impairment
- Solitary kidney
- Intractable nausea and vomiting
- Intractable pain
- Failure of medical therapy

Treatment Options

- Historically
 - Open Surgery
- Modern options
 - Extracorporeal shockwave lithotripsy SWL
 - Ureteroscopy
 - Percutaneous nephrolithotripsy PCNL
 - Laparoscopic/ Robotic
- Nephrectomy

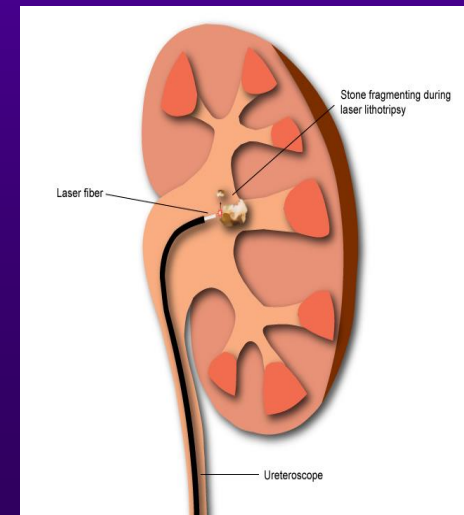
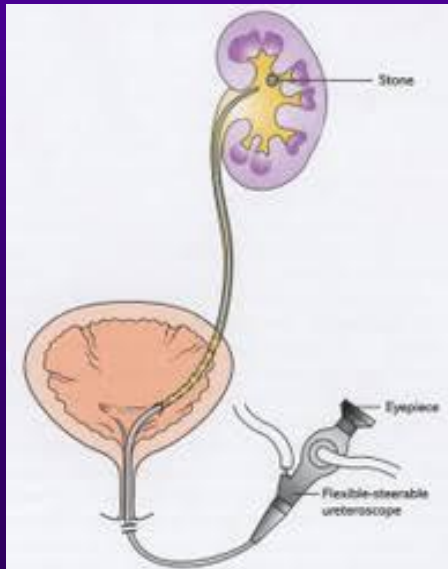
Extracorporeal Shock Wave Lithotripsy SWL

- Who
 - Small ≤ 2 cm
 - Radiopaque stones



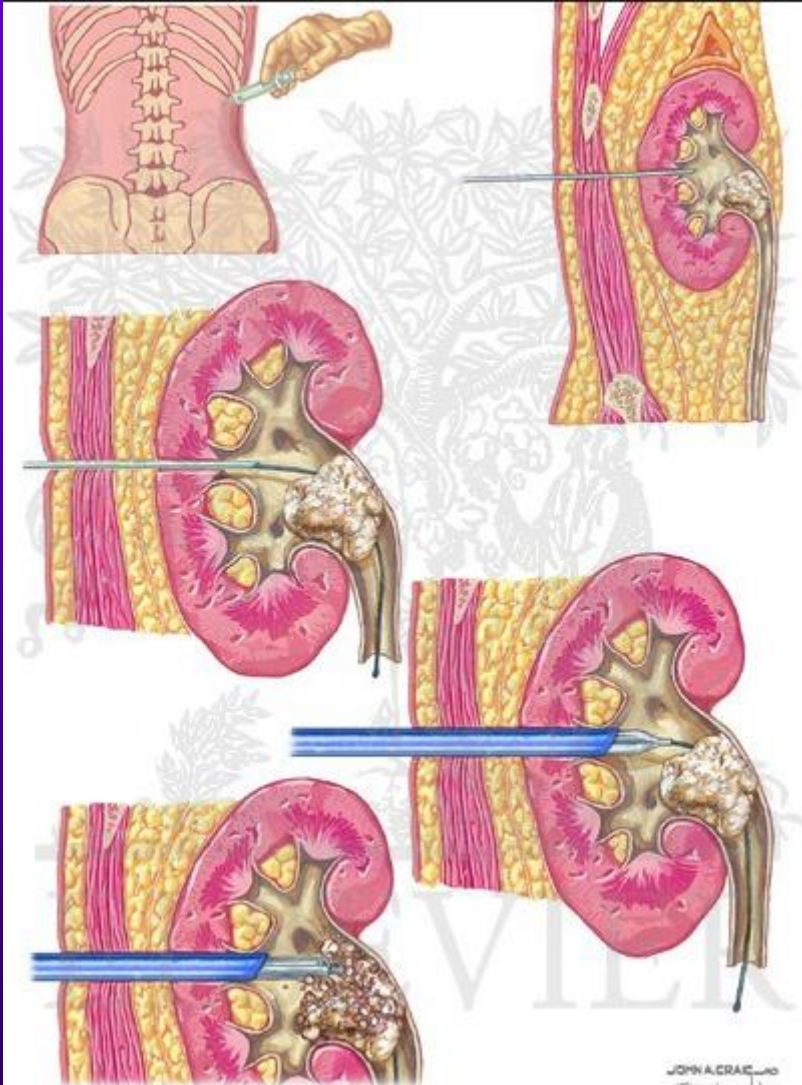
Ureteroscopy

- Renal stone $\leq 2\text{cm}$
- Ureteric stone



Percutaneous Nephrolithotomy

PCNL



1



2



3



4



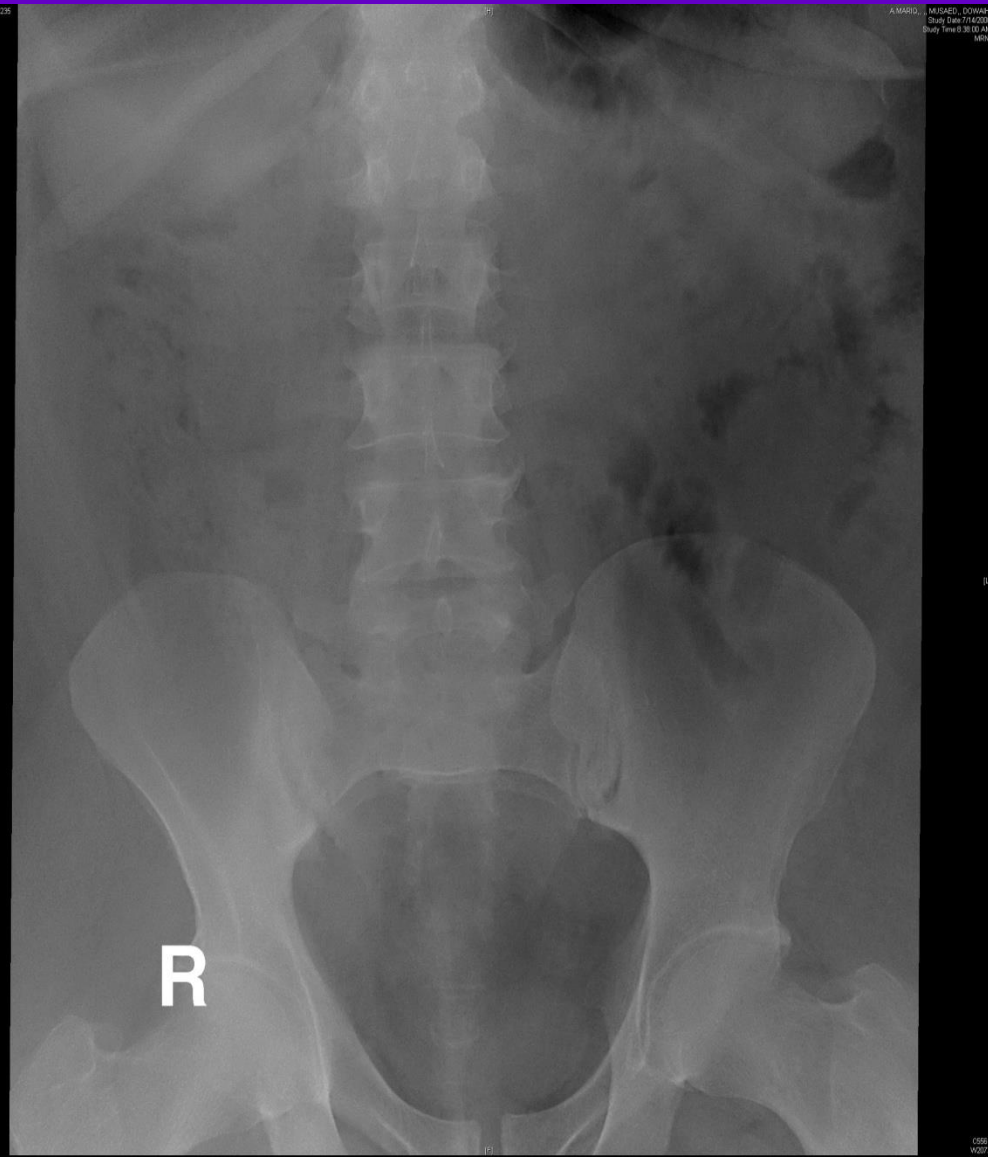
5



6



Post op



Pediatric PCNL

- Safe and Effective
- Almost replaced open stone surgery

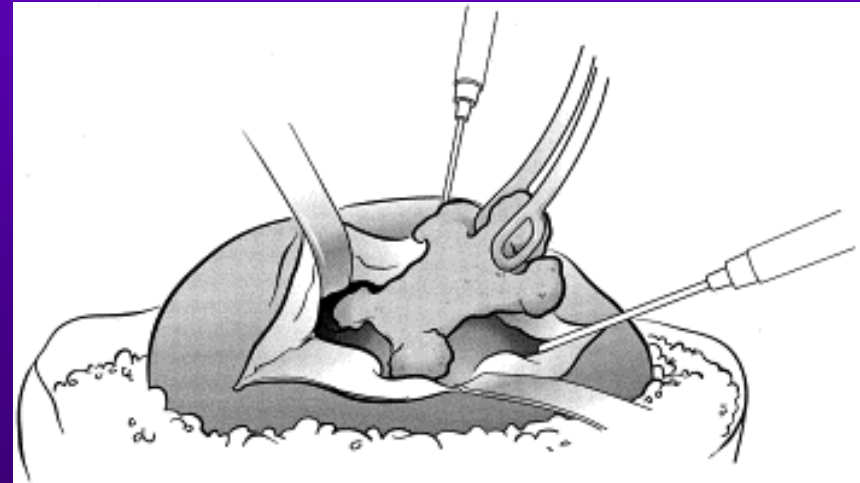
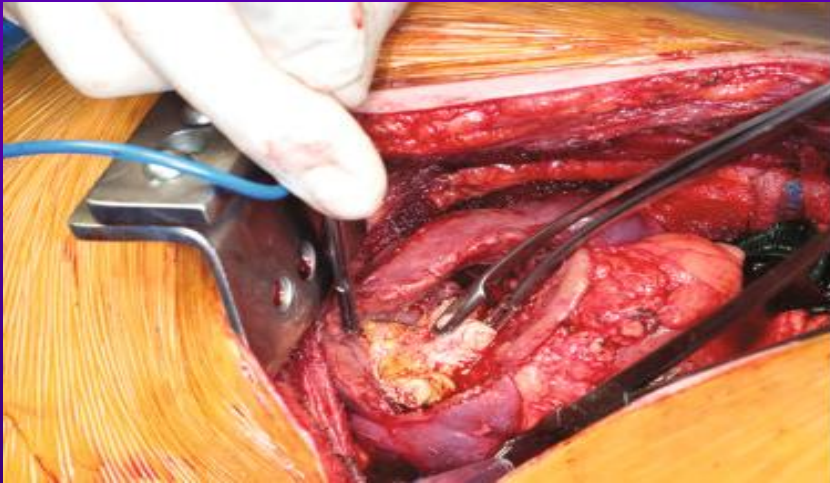
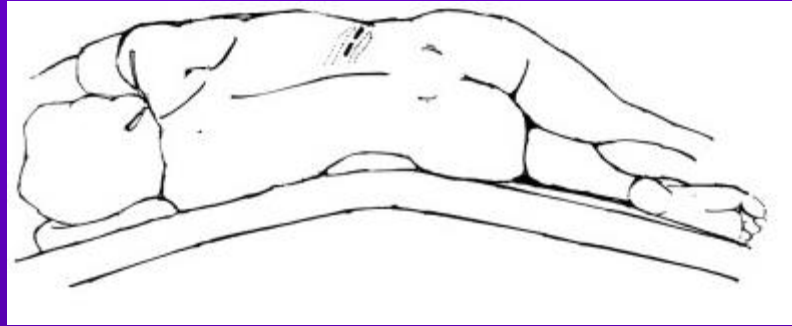


Percutaneous Nephrolithotomy

PCNL

- Large stone volume
- Staghorn calculi
- Cystine composition
- Associated distal obstruction (UPJO, Tic, etc)
- Renal anomalies (horseshoe, pelvic)
- Morbidly obese or orthopedic condition
- Certainty of result (Aviators, Struvite)
- Other modality failure

Anatrophic Nephrolithotomy

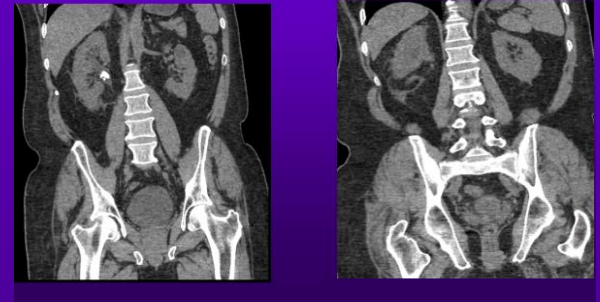


Management

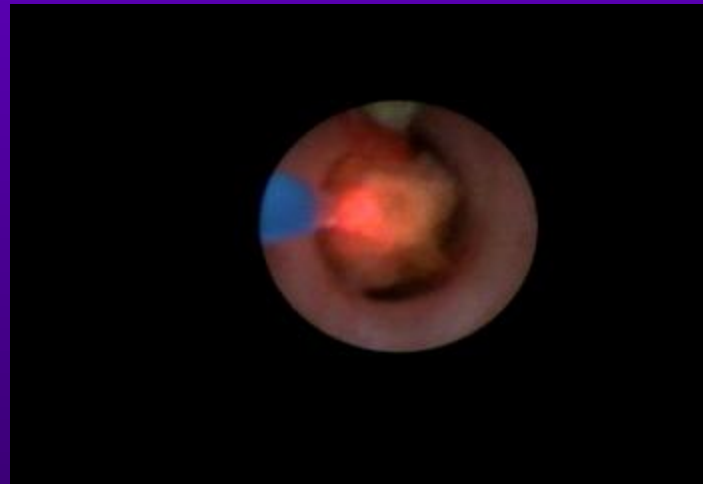
Our patient

- Admitted
- Preop Antibiotics
- Rt Ureteroscopy laser lithotripsy
- Patient discharged next day

Our Patient result



Laser Lithotripsy



Q&A

Thank you

