Active treatment of lithiasis

Kidney stones (nephrolithiasis)

- **ESWL**:  
  - **Indicated** for all stones <2 cm (<300mm²). If the CT shows an attenuation coefficient >1000 HU, ESWL disintegration is more difficult. For stones >2 cm, a double J catheter should be inserted to prevent possible obstruction.  
  - **Contraindicated** in pregnancy, in calculi near an aortic aneurysm, or in patients with morbid obesity, coagulation disorders, or urinary sepsis.  
  - **Special considerations.**  
    ▪ A urine culture should be carried out one week before the procedure; if the results are positive or if infective lithiasis is suspected, antibiotics should be administered before and after the procedure.  
    ▪ Feasible in patients with cardiac pacemakers.  
    ▪ Possible in cases of aortic aneurysm if the stone is not near the site of aneurysm.  
    ▪ **Antiplatelet** drugs must be reduced/suspended 10 days and **NSAIDS** between 12 h and 7 days prior to the procedure *(See chapter on Antiplatelet Drugs and Surgery)*.  
  - **Feasible for select staghorn calculi** only if the following requirements are met:  
    ▪ Theoretically soft or intermediate consistency.  
    ▪ Central disposition.  
    ▪ No calyceal or morphological alterations and with wide infundibula.  
    ▪ Good renal function.  
    ▪ Previous placement of a double J catheter.  
    ▪ Informed consent of patient with regard to the risks of this conservative procedure.  

- **Percutaneous nephrolithotomy**:  
  - Stones >2 cm or hard stones <2 cm (monohydrate calcium oxalate, cystine, or brushite).  
  - Staghorn calculi.  
  - Pyelic stones with associated stenosis of the UPJ.  
  - Symptomatic diverticular stones that have not been expelled after ESWL.  
  - Contraindicated during pregnancy.  

- **Retrograde intrarenal endoscopic surgery**:  
  - The latest flexible endoscopes and various lasers make this the technique of the future.  

- **Open surgery**:  
  - Stones with severe calyceal abnormalities; in cases of multiple infundibular stenoses.  
  - Staghorn calculi with peripheral dominance and narrow infundibula.  
  - Significant obesity that hampers ESWL or percutaneous treatment.  
  - Somatic or spinal alterations that hamper more conservative treatments.

Ureteral stones

- **Treatment of renal colic**. Requires pain relief and adequate hydration. Hot baths help to reduce pain intensity. Cases of intractable pain with oral medication or intense vomiting require hospitalization for parenteral treatment with **analgesics** and **antiemetics**. **NSAIDS** for one week help to reduce edema and contribute to pain relief. *(See chapter on Renal Colic).*

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand name®</th>
<th>Parenteral dose</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diclofenac*</td>
<td>VOLTAREN</td>
<td>1 inj of 75 mg/12 h</td>
<td>24-48 h</td>
</tr>
<tr>
<td>Ketorolac*</td>
<td>TORADOL</td>
<td>1 inj of 30 mg/6 h</td>
<td>24-48 h</td>
</tr>
<tr>
<td>Tramadol</td>
<td>TRAMADOL, TRAMAL</td>
<td>1 inj of 100 mg/8 h</td>
<td>24-48 h</td>
</tr>
<tr>
<td>Pentazocine</td>
<td>FORTRAL, PENTAZOCINE</td>
<td>1 inj of 30 mg/4 h</td>
<td>24-48 h</td>
</tr>
<tr>
<td>Pethidine</td>
<td>DEMEROL, PETHIDINE</td>
<td>1 inj of 100 mg/8 h</td>
<td>24-48 h</td>
</tr>
<tr>
<td>Metoclopramide</td>
<td>PRIMPERAN</td>
<td>1 inj of 100 mg/8 h</td>
<td>1-2 d</td>
</tr>
<tr>
<td>Ondansetron</td>
<td>ZOFRAN, ONDANSETRON</td>
<td>1 inj of 8 mg/12 h</td>
<td>1-2 d</td>
</tr>
</tbody>
</table>
**Indications for active treatment of lithiasis**: in ureteral stones <7mm, an attitude of watchful waiting should be adopted over a reasonable period (2 weeks) using *alpha-blockers* to help the progression of the stone.

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand name®</th>
<th>Oral dose</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfuzosin</td>
<td>XATRAL, UROXATRAL</td>
<td>1 tab of 10 mg/24 h</td>
<td>4 wks</td>
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<tr>
<td>Doxazosin</td>
<td>CARDURA</td>
<td>1 tab of 4-8 mg/24 h</td>
<td>4 wks</td>
</tr>
<tr>
<td>Silodosin</td>
<td>SILOYDX, RAPAFLO</td>
<td>1 caps of 8 mg/24 h</td>
<td>4 wks</td>
</tr>
<tr>
<td>Tamsulosin</td>
<td>OMNIC OCAS, FLOMAX</td>
<td>1 caps of 0,4 mg/24 h</td>
<td>4 wks</td>
</tr>
<tr>
<td>Terasosin</td>
<td>HYTRIN</td>
<td>1 tab of 2-5 mg/24 h</td>
<td>4 wks</td>
</tr>
</tbody>
</table>

**ESWL:**
- Lithiasis in the lumbar or iliac ureter, especially if <1 cm.
- In men, small or moderately sized stones in the distal ureter.
- Placement of double J catheters seems to decrease the efficacy of ureteral lithotripsy.

**Ureterorenoscopy:**
- Distal ureteral stones in young women (to avoid the effects of ESWL on the ovaries).
- If ESWL fails to resolve a ureteral stone or for stones > 1 cm.
- The preferred method is lithotripsy with a *holmium*:YAG laser.
- Prior meatal dilation is not usually necessary.
- Placement of a double J catheter after URS must be assessed in each case according to the presence of edema or residual fragments, although its use is increasingly restricted.

**Observation:**
- Watchful waiting for expulsion is indicated for stones <10 mm with no infection/ectasia.

**Bladder stones**

- **Endoscopic lithotripsy:**
  - Via mechanical lithotripsy (*Mauermayer* or *Hendrikson* lithotripters), *Lithoclast*®, laser.

- **Open surgery:**
  - In patients requiring some type of concomitant surgery (BPH, urethral stenosis).
  - For extremely large stones.

**Urethral stones**

- **Endoscopic lithotripsy:**
  - Via mechanical lithotripsy, extraction with graspers, *Lithoclast*®, or laser.