Postoperative care after urological surgery

Renal surgery

- **Open renal biopsy:**
  - *Drainage:* removed after 24 h if there is no output.

- **Conservative kidney surgery (enucleation and partial nephrectomy):**
  - *Drainage:* removed in stages depending on output on the 2\(^{nd}\)-3\(^{rd}\) day after surgery.

- **Partial or radical laparoscopic nephrectomy:**
  - *Drainage:* removed in stages once output falls below 50 mL in 24 h.

- **Simple nephrectomy:**
  - *Drainage:* removed when output ceases (50 ml in 24 h).

- **Radical kidney surgery (anterior transperitoneal approach):**
  - *Drainage:* removed in stages once output falls below 50 mL in 48 h.

- **Renal trauma surgery:**
  - *Drainage:* removed as early as possible to avoid infection of the hematoma.

- **Pyelolithotomy:**
  - *Drainage:* removed 48 h after surgery, when output has subsided.
  - *Double J catheter:* removed 4-6 weeks after surgery.

- **Percutaneous nephrolithotomy:**
  - *Percutaneous drainage:* removed when urine is clear and after taking a simple X-ray to detect lithiasic fragments that can be removed with a "second look."
  - *Double J catheter:* removed 2 weeks after the removal of percutaneous drainage.
  - *Urethral catheter:* removed after the procedure if no double J catheter has been used. If a double J catheter is in place, this stent is removed 24 h after removing the percutaneous drainage to maintain negative pressure in the renal pelvis and reduce urinary leakage.

- **Kidney transplant:**
  - *Drainage systems:* removed when no longer productive.
  - *Bladder stent:* removed 5-7 days after surgery.
  - *Double J catheter:* if used, removed after 2-4 weeks.

UPJ Surgery

- **Pyeloplasty:**
  - *Urethral catheter:* removed within 24 h.
  - *Drainage:* removed in stages 48 h after surgery once output has stopped.
  - *Double J catheter:* removed 4-6 weeks after surgery.
  - *If a nephrostomy has been used as an internal guide:* a pyelography is performed within 7-10 days and if there is no extravasation, it is clamped for 12-24 h and then removed.

- **Percutaneous antegrade endopyelotomy:**
  - *Urethral catheter:* removed 24 h after surgery.
  - *Double J catheter:* maintained for 2-4 weeks (endopyelotomy catheter or double J).

- **Endopyelotomy with electrocautery balloon catheter:**
  - *Urethral catheter:* removed within 24 h.
  - *Double J catheter:* should be maintained until at least 4 weeks after surgery.

- **Ureteroscopic retrograde endopyelotomy:**
  - *Urethral catheter:* removed 24 h after surgery.
  - *Double J catheter:* removed within 4 weeks after surgery.

- **Ureterorenoscopy:**
  - *Urethral catheter:* if used, it is removed within 12-24 h.
  - *Double J catheter:* if left in after the procedure, it can be removed after 1 week after first taking a simple abdominal X-ray to verify the absence of lithiasis or the presence of non-significant fragments.
Ureteral surgery

- **Ureterolithotomy:**
  - Urethral catheter: if used, it is removed 24 h after surgery.
  - Drainage: removed once output has ceased, after the first 24 h after surgery.
  - Double J catheter: removed 4-6 weeks after surgery.

- **Ureteroneocystostomy or bladder flap repair (Boari) or Psoas Hitch procedure:**
  - Urethral catheter: removed 4-5 days after surgery, depending on the technique used.
  - Drainage: removed after 24-48 h, once output has subsided.
  - Double J catheter: removed 4-6 weeks after surgery.

Bladder surgery

- **Partial cystectomy:**
  - Urethral catheter: removed after the 7th day after surgery provided hematuria has subsided. A cystography should be performed beforehand to ensure that the suture is watertight.
  - Double J catheter: if a ureteral reimplantation has been performed after resection of the ureteral meatus, the catheter is removed 4-6 weeks after surgery.

- **Cystolithotomy:**
  - Urethral catheter: removed after the 3rd day after surgery provided there is no hematuria.

- **Bladder Augmentation (Cystoplasty):**
  - Nasogastric tube: removed immediately after surgery.
  - Drainage: removed once the output falls below 50 mL.
  - Urethral catheter: removed after 10-14 days. A cystography should be performed beforehand to ensure that the suture is watertight.

- **Radical cystoprostatectomy:**
  - Nasogastric tube: removed immediately after surgery.
  - Drainage: removed when the output is minimal (50 mL).

- **Transurethral bladder resection:**
  - Continuous bladder irrigation: removed after the cessation of hematuria, after 12-24 h.
  - Urethral catheter: removed once urine is clear, 24-48 h after surgery.

Surgery with use of the intestine

- **Hautmann or Studer neobladder:**
  - Bladder washing every 6 h with NSS and mucolytics to extract mucous.
  - Ureteral catheters: removed 7 days after surgery. If doubt exists as to whether the anastomosis is watertight, a retrograde pyelography via the ureteral stent is performed.
  - Cystostomy: removed 10 days after surgery after performing a filling cystography to check whether the neobladder is watertight.
  - Urethral catheter: removed after 12-14 days or 48 h after removing the cystostomy.

- **Ileocecal reservoir (Indiana pouch):**
  - Washing every 6 h with NSS and mucolytics for extracting mucous.
  - Ureteral catheters: removed at least 7 days after surgery. If doubt exists as to whether the anastomosis is watertight, a retrograde pyelography via the ureteral stent is performed.
  - Cecostomy tube: removed when the patient learns home catherization techniques.
  - Starting home catherization: 3 weeks after surgery.

- **Ureterosigmoidostomy (Mainz II):**
  - Rectal catheter: removed when gastrointestinal transit resumes.
  - Ureteral catheters: removed after the 10th day after surgery.

- **Ileal conduit (Bricker):**
  - Ureteral catheters: removed after 7 days. If doubt exists as to whether the anastomosis is watertight, a retrograde pyelography via the ureteral catheter is performed.
Prostate surgery

- **Open radical prostatectomy:**
  - **Drainage:** removed once output has fallen below 50 mL in 24 h.
  - **Urethral catheter:** removed after 7 days if there is no extravasation (cystogram). This occurs in 80% of cases. If there is extravasation, it is best to remove the catheter after 14 days of complete drainage. No prior cystogram required, except if there is doubt about the anastomosis technique.
  - **Perineal training (Kegel exercises):** started 3-4 days after surgery.

- **Extraperitoneal laparoscopic radical prostatectomy:**
  - **Drainage:** removed once output has fallen below 50 mL in 24 h.
  - **Urethral catheter:** removed on the 5th day if there is no leakage, usually after performing a retrograde cystogram, although this is not strictly necessary.
  - **Perineal training (Kegel exercises):** started 3-4 days after surgery.

- **Perineal radical prostatectomy:**
  - **Drainage:** removed once drainage output is minimal (<50 mL).
  - **Urethral catheter:** removed after 7 days if there is no extravasation.
  - **Perineal training (Kegel exercises):** started 3-4 days after surgery.

- **Simple perineal prostatectomy:**
  - **Drainage:** removed on the 3rd-4th day, when output subsides.
  - **Urethral catheter:** removed on the 7th day, when hematuria has ceased.

- **Suprapubic or retropubic prostatectomy:**
  - **Continuous bladder irrigation:** stopped after 12-24 h, after the cessation of hematuria.
  - **Perivesical drainage:** removed when output ceases (3rd-5th day after surgery).
  - **Urethral catheter:** removed between the 5th-7th day after surgery or sooner (3rd day) if there is a cystostomy. This will be removed once the postvoid residual is zero.

- **Endoscopic bladder neck incision:**
  - **Urethral catheter:** removed between 24-48 h after surgery, once urine becomes clear.

- **Transurethral resection of the prostate:**
  - **Continuous bladder irrigation:** stopped after 12-24 h, after the cessation of hematuria.
  - **Urethral catheter:** removed once urine becomes clear, between 24-48 h after surgery.

- **Photovaporization of the prostate with KTP laser:**
  - **Urethral catheter:** removed 6-12h after surgery, once the urine has become clear.

- **Enucleation of the prostate with Holmium: YAG laser (HOLEP):**
  - **Urethral catheter:** removed 24-48 h after surgery.

Urethral surgery

- **Urethrotomy:**
  - **Urethral catheter:** we recommend removing it between the 1st and 5th day after surgery.

- **End-to-end spatulated urethroplasty:**
  - **Drainage:** suction drainage should be mobilized and removed when no longer productive (24-48 h).
  - **Urethral catheter:** removed after 2-3 weeks. After complex surgeries, a retrograde cystourethrogram can be performed prior to removal to ensure the absence of fistulas. If they persist, a subsequent review should be planned.

- **Urethroplasty with grafts or flaps:**
  - **Drainage:** suction drainage is mobilized and removed when no longer productive (24-48 h).
  - **Urethral catheter:** after 3 weeks, a retrograde cystourethrogram is performed; if there is no leakage, the catheter is removed.

- **Artificial sphincter implant:**
  - **Urethral catheter:** removed 24 hours after implantation.
- Sphincter activation: 4-6 weeks after implantation, after educating the patient about handling the device.

**Penile surgery**

- **Priapism surgery:**
  - Monitoring for recurrence of priapism: if there is doubt between recurrence or postsurgical penile edema, a gasometry of the corpora cavernosa or a Doppler ultrasound should be performed.

- **Peyronie’s disease:**
  - Urethral catheter: removed 24 h after surgery along with the dressings.

- **Partial penectomy:**
  - Urethral catheter: removed 48-72 h after surgery.

- **Total penectomy:**
  - Drainage: removed once output is minimal (50 mL in 24 h).
  - Urethral catheter: removed 48 h after surgery.

- **Penile prosthesis:**
  - Urethral catheter: removed 24 h after surgery along with the penile dressings.
  - Prosthesis activation (with 2 or 3 components): activated 4-6 weeks after surgery after educating the patient about handling the prosthesis.

**Testicular and scrotal surgery**

- **Epididymectomy:**
  - Drainage: removed 12-24 h after surgery, provided that output is minimal.

- **Hydrocele:**
  - Drainage: removed 12-24 h after surgery, provided that output is minimal.

- **Excision of epididymal cyst:**
  - Drainage: removed 12-24 h after surgery, provided that output is minimal.

- **Testicular trauma:**
  - Drainage: removed once output ceases (24-48 h after surgery).

- **Orchiectomy:**
  - Drainage: if left in place, removed 12-24 h after surgery.

- **Vasectomy:** no drainage required