Urologic Surgical Complications In Renal Transplantation

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Urologic Complications

- Review of Bladder Anastomosis
- Complications and Management
  - Obstruction
  - Leak
  - Reflux
  - Stones
  - Hematuria

Bladder Anastomosis
Complications by Technique

Table 5. Prevalence of urological complications in all included studies.

<table>
<thead>
<tr>
<th>Complication</th>
<th>PL</th>
<th>LG</th>
<th>U</th>
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</thead>
<tbody>
<tr>
<td>Leaks</td>
<td>95/220 (42.3%)</td>
<td>116/716 (16.6%)</td>
<td>40/137 (7.4%)</td>
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<tr>
<td>Ureteral strictures</td>
<td>166/720 (12.2%)</td>
<td>136/716 (1.9%)</td>
<td>52/137 (3.7%)</td>
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<tr>
<td>Vesicoureteral reflux</td>
<td>291/220 (13.5%)</td>
<td>85/716 (4.5%)</td>
<td>60/137 (4.3%)</td>
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<tr>
<td>Hematuria</td>
<td>76/120 (6.1%)</td>
<td>52/716 (1.0%)</td>
<td>60/137 (4.3%)</td>
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PL, Polievsky-GaiBett; LG, Lish-Garopp; U, Uriach

Obstruction

Blockage of urine flow along urinary tract.

Can occur at level of renal pelvis (UPJ) or at bladder anastomosis (UVJ)

Signs/symptoms include rise in creatinine, drop in urine output.

Treatment options depend on whether early (<6 months) or late after transplant.

Case 1

57 yof, ESRD from GN, received living donor transplant, extravascular bladder anastomosis without stent.

Initial good function, with drop in creatinine to 1.4, D/C on POD 3, Foley out.

Seen in clinic, POD 10, Cr up to 1.8

Admitted for biopsy, moderate hydronephrosis noted on ultrasound.

Case 1

Biopsy not done.

Patient sent to Interventional Radiology for percutaneous antegrade pyelogram

Obstruction at UVJ, nephrostomy tube left in
Case 1

Discharged, follow-up creatinine rose to 2.8, but gradually fell to 2.1

Returned for stent placement, nephrostomy tube capped

Will have stent removal at six weeks, may need biopsy if creatinine does not fall to baseline (1.3)

Early UVJ Obstruction

Managed initially with stent, removed at six weeks with follow-up creatinine after stent removal.

Nephrostomy left in place but capped

If follow up Cr rises- nephrostomy tube opened and definitive surgery scheduled

If follow up Cr stable-nephrostomy tube removed
Early UVJ Obstruction

Etiology of UVJ obstruction:
- Poor surgical technique
- Tunnel too tight
- Ischemia of distal ureter
- Edema at anastomosis (most common)

Early Obstruction Above UVJ

Etiology:
- More extensive ischemia
- Twist in ureter
- Compression by vessels
- Compression by lymphocoele

Usually will require surgical fix

Case 2

48 yom, ESRD from PCKD, deceased donor transplant 4 years ago.

Slow rise in creatinine from 1.8 to 2.4

Admitted for biopsy

Ultrasound reveals hydroureter, biopsy aborted

Interventional radiology for antegrade pyelogram.
Case 2

Longer segment narrowing found with slow drainage into bladder.

Dilated, nephroureteral tube placed.

Creatinine returned to baseline

Since obstruction > 6 months, option of surgery discussed.

Patient is not an optimal candidate, will try repeat dilation with 6 weeks of stent.

If fails (likely), then surgical repair
Late Obstruction

Etiology:
- Ischemia of ureter
- Stones
- Fungus ball
- Tumor
- Polyoma virus
- Lymphocele

Surgical repair generally needed, lifelong stent for nonsurgical candidates

Options for Surgical Repair

Reimplant ureter—requires adequate length of healthy ureter

Uretero-ureterostomy— to ipsilateral native ureter or rarely to contralateral ureter

Mobilization of bladder for psoas hitch or Boari flap

Pyelovesicostomy if no useable ureter
Lymphocoele

2-5% of transplants, may be asymptomatic

Obstruction of ureter, compression of iliac vein or wound complications are possible clinical features

Aspiration of fluid, high lymphocyte count is diagnostic

Lymphocoele

Aspiration to near collapse of cavity occasionally successful

Most commonly peritoneal window for drainage is needed, often done laparoscopically

If window not possible, aspiration with introduction of sclerosing agent may be successful.
Urine Leak

Most commonly occurs early post-tx, usually detected when Foley removed

Hallmarks are severe pain, wound drainage, drop in urine output

Diagnosis confirmed by MAG 3 study showing extravasation of contrast
Urine Leak

Etiology:
- Poor technique with gaps in suture line
- Ischemia of distal ureter with necrosis of tissue
- Unrecognized damage to ureter or bladder

Immediate treatment involves replacement Foley, followed by definitive surgical repair (reimplant ureter or uretero-ureterostomy)

High rate of success with repair

Role of Stents To Prevent Obstruction/Leak

- Cochrane Review: Routine stenting decreases early urologic complications by 24%
- Downside is increased incidence of UTI, cost of stent and removal
- Selective use has not been well studied
- Potential indications:
  - Small ureter
  - Complex ureter anatomy
  - Extrarenal pelvis
  - Large kidney

Case 3

56 yof, ESRD from IgA nephropathy, deceased donor transplant 6 years ago with Cr 0.8

Recurrent pyelonephritis, up to monthly infections

Failed conservative management (double voids, suppressive antibiotics, methenamine, cranberry tablets)

Developing resistance to antibiotics

Case 3

Ultrasound negative for stones, debris

VCUG to assess bladder emptying and presence of reflux
Reflux

Need to rule out infection in native kidneys (selective sampling of urine from transplant and native kidneys)

Rule out bladder stones, suture in bladder

Need to confirm that bladder emptying is adequate

Reflux common despite anti-reflux tunnel

Surgical management involves ureter reimplantation with new tunnel or uretero-ureterostomy.

Stone disease

- May be de-novo or “gifted”
- If mobile stone detected in donor, can attempt removal on back table before kidney implanted.
- Presentation of stone disease may be with infection or obstruction, usually painless
Stone disease: Therapy

- Percutaneous retrieval of large stones (>1.5 cm)
- Shock wave lithotripsy may be needed
- Smaller stones extracted with ureteroscope if transplant ureter orifice can be cannulated

Hematuria

Common immediately post-transplant, related to bleeding from bladder anastomosis

Usually self limited, bladder irrigation to prevent obstruction of Foley.

If hematuria develops POD 2-3, ultrasound to rule out venous thrombosis
Hematuria
Late hematuria:
May be related to biopsy,
If persistent, angiography needed to evaluate for arterial fistula
Evaluate for malignancy, in transplant, native kidneys, or bladder
Polyoma virus or adenovirus
“Forgotten” stent
Failed kidney: Transplant Nephrectomy

Conclusions
Management of urologic complications post-tx often complex, requires multidisciplinary approach
Management (and etiology) varies depending on time post-transplant
Cooperation of transplant surgeons and urologists often beneficial

Conclusions
Surgical Plumbers don’t charge triple overtime on weekends and holidays!!