Renal autotransplantation

Jose A Torres, MD
SUNY Downstate Medical Center
9/21/2017
Case presentation

- 40 yo F with h/o perforated sigmoid adenocarcinoma s/p ex-lap, Hartmann’s procedure and en-bloc resection of L mid ureter & L fallopian tube in 6/2016
  - L percutaneous nephrostomy (PCN) placed post-op
  - Underwent/completed FOLFOX for T4N1M0 adenocarcinoma
  - Presented 7/2017 for Hartmann’s reversal, ureter reconstruction, hysterectomy/salpingo-oophorectomy
Case presentation

- Gyn/Onc performed total abdominal hysterectomy, right salpingo-oophorectomy
- Gen Surgery performed Hartmann’s reversal
- GU began to dissect L ureter and noted size to be < 3cm from ureteropelvic junction. Could not identify distal ureter due to desmoplastic reaction in pelvis
- D/w family options
  - Ileal interposition
  - Continue L percutaneous nephrostomy (PCN)
  - Simple nephrectomy
Case presentation

- GU and family elected to perform simple nephrectomy
- Post-op patient did well; Cr and CrCl remained normal
- Q: would this patient have benefited from renal auto-transplantation?
Outline

- History
- Anatomy
- Conventional treatment options
- Indications
History

- James Hardy—1963
  - First renal auto-transplantation
  - Due to high ureteral injury during aortic surgery
  - Transplanted to ipsilateral iliac fossa
Anatomy

- Renal cortex
- Renal medulla
- Renal pyramids
- Pelvis
Anatomy

- Site of obstruction
  - Ureteropelvic junction (UPJ)
  - Pelvic brim
  - Ureterovesical junction (UVJ)
Conventional treatment

- Distal ureteral injuries
  - Psoas flap
  - Boari flap
- Mid ureteral injuries
  - Ureteroureterostomy
  - Transureteroureterostomy
Psoas flap
Boari flap
Ureteroureterostomy
Transureteroureterostomy

![Diagram of Transureteroureterostomy](image)
Ileal interposition graft

Seven Configuration  Reverse-Seven Configuration
Renal autotransplantation

- **Indications**
  - Renovascular disease
  - Complex urologic reconstruction
    - High ureteral injury
  - Ureteral stenosis
  - Neoplastic diseases
Renal autotransplantation
Renovascular disease

- Renal artery aneurysms
- Fibromuscular dysplasia
- Takayasu disease
- Atherosclerosis
- Renal artery stenosis

ONLY indicated when fail percutaneous angioplasty or in-vivo repair
Renovascular disease

- Safe intervention that improves:
  - Creatinine, creatinine clearance, blood pressure
  - Survival
    - 5 yrs greater than 94% for fibromuscular disease & Takayasu
    - Atherosclerosis 54% at 5 yrs
  - Secondary patency
  - HTN normalization
Renal autotransplantation

**Indications**

- Renovascular disease
- Complex urologic reconstruction
  - High ureteral injury
  - Ureteral stenosis
- Neoplastic disease
Urologic injury

- **Bodie et al**
  - 26 pts—93% preserved renal function at 14 yrs

- **Novick et al**
  - 27 pts—92% preserved renal function
Urologic injury

- Eisenberg et al
  - 15 pt for lap nephrectomy/transplant for complex ureteral strictures
    - 12 nephrolithiasis, 2 UPJ obstruction, 1 iatrogenic
  - Stricture length 1-7cm
    - No recurrence of stricture
  - 2 developed pseudoaneurysms (12% of study)—high!
    - Considered to be associated with ureteral stent or nephrostomy tubes—sources of infections and increased inflammatory state
Urologic injury

- Hau et al

  Indications

  - Proximal ureter injury
  - Avulsion 2/2 ureteroscopic stone manipulation
  - Ureter injury 2/2 lap retroperitoneal lymphadenectomy in Gyn CA
  - Injury to ureter after aortobifemoral bypass
  - Ureter injury 2/2 retroperitoneal abscess 2/2 panc transplant
Renal autotransplantation

- Indications
  - Renovascular disease
  - Complex urologic reconstruction
    - High ureteral injury
  - Ureteral stenosis
  - Neoplastic disease
Neoplastic disease

- Controversial
- Flatmark et al—15 autotransplants for renal tumors
  - Frozen sections to ensure tumor-free
  - At 3.2 yrs, no recurrence
  - Complications—wound infection, DVT
Neoplastic disease

- Complex RCC
  - 36 pts—path T1-T3aN0M
  - Extracorporeal excision—for solitary kidneys, large central tumors, b/l disease
    - Short term follow up—2.8 yr—1 with distant disease
  - Conclusion: ex vivo tumor excision with autotransplant safe last resort
Neoplastic disease

- Long term data
  - Stormont et al—20 pts, success 16 pts
  - Mean 35 month f/u
    - 4 with recurrence (25%)
    - Only 6 were free of recurrence of disease or HD
- Conclusion: repeat CT to eval local recurrence or metastasis ever 3-6 months
Conclusion

- Consider renal autotransplant as safe intervention when have renovascular, complex ureteral injuries, and renal tumors (although controversial)
Assessing renal function

- 99Tc-MAG 3 renal scan look at the blood supply, function and excretion of urine from the kidneys
  - Best test to assess split renal function
  - Loosely binds to serum proteins
  - Cleared by tubular secretion
    - 70% cleared in 30 mins
    - 90% cleared in 3 hrs
99Tc-MAG3 renal scan

- Assessment of whole or relative kidney function
  - Before and after surgical intervention (e.g., pyeloplasty, partial/total nephrectomy)
  - Investigation of acute or chronic renal failure
  - Assessment of the transplanted kidney
  - Assessment of renal function following trauma

- Assessment of kidney drainage in obstructive uropathy (e.g., ureteropelvic junction obstruction, renal stones)

- Assessment of congenital renal abnormalities (e.g., duplex, horseshoe, absent, ectopic, or cystic kidneys)

- Identification of vesico-ureteric reflux