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| **TITLE:** Emory Transplant Center Kidney/Pancreas Benign Ureteral Stricture Protocol | |
| **APPLICABLE FACILITIES:** (check all that apply)  □EUH **□**EUOSH □EWWH □EUHM □EJCH □ESJH □TEC □ESA □ERH | |
| **EFFECTIVE DATE:** 11/3/2021 | **ORIGINATION DATE:** 09/20/2021 |

**SCOPE:**

The Emory Transplant Center Kidney and Pancreas Transplant Program.

**PURPOSE:** The Emory Kidney Transplant Program is committed to caring for patients with transplant ureteral strictures. The following is a general protocol for the clinical management of benign transplant ureteral strictures. It is not meant to be an all-encompassing script; case specifics may create clinical variability and the need for deviation from what this protocol states. The goals of this protocol are to a) restore ureteral patency, b) protect renal function, and c) minimize the time between diagnosis and definitive therapy.

**GUIDELINES:**

**Diagnosis and Initial Management**

A transplant ureteral stricture should be suspected in the event that a patient presents with an elevated creatinine and moderate or severe hydronephrosis, not corrected with bladder decompression and not immediately attributable to any other cause. The interventional radiology (IR) service should be consulted to place a percutaneous nephrostomy tube (PCN) for immediate decompression. A detailed nephrostogram should be performed upon decompression of the system, if feasible. In addition to standard laboratory investigations, BK virus levels should be checked. Thereafter, the patient should be referred for consultation in the dedicated ureteral stricture virtual clinic (please message Dr. Cristea’s Urology PCC: Barbara Miller).

**Management Options Overview**

Broadly speaking, the treatment of transplant ureteral strictures can be divided into 3 major categories:

**A) Endourologic Treatment** – this involves the placement of guide wire across the strictured area, followed by a cutting balloon dilatation. The area is then allowed to heal over a stent or percutaneous nephroureteral tube (PCNU) for 4-6 weeks, after which time a repeat evaluation +/- clinical trial of the stricture is performed. Alternatives to balloon dilatation include endoscopic incision of the ureteric stricture using holmium laser, cold knife, or other modalities. Based on the published literature, this approach has a success rate of approximately 60-65%.

**B) Open Surgical Repair** – this involves an open surgical repair and revision of the ureteric anastomosis or strictured area; this may involve a re-implantation of the transplant ureter, a uretero-pyelostomy using the patient’s native ureter, or a pyelo-vesicostomy, as indicated. Based on the published literature, this approach has a success rate of approximately 85-90%.

**C) Chronic Drainage** – this involves long-term drainage via either external (PCN/PCNU) or internal (ureteral stent) modalities.

**Approach to Ureteral Strictures Based on Size**

**Short Segment Stricture (< 2cm)**

1. The initial approach to a focal, short ureteral stricture should consist of ***Endourologic Treatment,*** using the following sequence:

i) Initial dilatation of stricture, preferably using an 8 mm cutting balloon, followed by placement of a 14 or 16 Fr PCNU, as tolerated

ii) PCNU in situ for 4-6 weeks; please note, during this time the PCNU may be capped for patient comfort; the internal component continues to act as a ureteric stent

iii) After 4-6 weeks, conversion of PCNU to PCN and performance of a high quality nephrostogram

*- If nephrostogram demonstrates residual focal stricture, may consider a single additional dilatation and repeating step ii)*

iv) If nephrostogram demonstrates adequate drainage of contrast into the bladder, proceed with capping trial of nephrostomy tube

- *In the event of ambiguity, or if a capping trial is not feasible or indicated, may obtain a NM Lasix Renal Scan in order to rule out clinically significant obstruction*

v) After capping of PCN, repeat Cr in 48-72h and then again at 1-2 weeks. If Cr remains stable, remove PCN

*- The patient should be counseled to uncap the PCN and notify the care team in the event of decreased urine output or signs of systemic infection, such as fevers, chills, nausea, vomiting, or malaise.*

vi) After removal of the PCN, repeat Cr at 1 month, or sooner if indicated by regular follow-up protocol. Repeat imaging in the event of persistent Cr elevation.

vii) In the even of treatment failure or stricture recurrence, leave PCN uncapped and proceed with ***Open Surgical Repair.***

*- By default, leave PCN only. If requested by surgeon, IR may place an internal stent in addition to the PCN, in order to aid with intra-operative identification of the ureter*

2. An alternative initial approach to a focal, short ureteral stricture may also consist of ***Open Surgical Repair****,* if the patient prefers this approach.

**Long (> 2 cm) or Multiple Strictures**

1. Long or multiple strictures are very unlikely to respond to endourologic treatment. In order to avoid a delay of definitive management, the preferred initial treatment option is therefore ***Open Surgical Repair***

**Chronic Drainage**

Chronic drainage may be considered in the event of a) treatment failure with the above interventions, b) patient comorbidity preventing other management options, c) patient preference. Where possible, placement and interval exchange (q3-4 months) of a double-J ureteric stent is preferable to PCN/PCNU placement, but this may vary from patient to patient.

**Special Considerations**

Care should be taken with ureteric strictures that present many years post transplant. Due to the increased risk of malignancy with immunosuppression, these patients should undergo cross-sectional imaging with a CT or MR urogram to rule out the presence of any obstructing masses or urothelial lesions. As well, urine should be sent for cytology. Any concerning lesions should be further evaluated with ureteroscopy and biopsy.

A careful discussion should be conducted between the transplant surgeon and the transplant nephrologist before undertaking any surgical repair of a late ureteral stricture. It should be determined whether there is enough residual renal function to warrant such an intervention, and this may require a biopsy.

**DEFINITIONS:** *(If applicable)*

**REFERENCES AND SOURCES OF EVIDENCE:**

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**KEY WORDS:**

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| **REVIEW/APPROVAL SUMMARY:** | |
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