

Surgical Management of Ureteral Strictures After Radiation Therapy

Isabella Morgan*

Department of Urology, Coastal Oncology and Reconstructive Institute, Vancouver, Canada

DESCRIPTION

Ureteral strictures following radiation therapy represent a difficult reconstructive challenge in urology due to progressive fibrosis, compromised tissue vascularity, and delayed presentation. These strictures most commonly occur after pelvic radiotherapy for malignancies such as cervical, prostate, rectal, or endometrial cancers. Radiation-induced damage leads to gradual narrowing of the ureter, often months or years after treatment, making diagnosis and management particularly complex.

Patients frequently present with flank discomfort, recurrent urinary tract infections, hydronephrosis, or declining renal function identified incidentally on imaging. Because symptoms may develop slowly, significant obstruction can exist before clinical detection. In many cases, both ureters may be affected, especially when radiation fields encompass the entire pelvis.

Diagnosis relies on imaging modalities that evaluate both anatomy and function. Ultrasound is often the initial study, revealing hydronephrosis. Computed tomography urography provides detailed localization of the stricture and assessment of surrounding fibrosis. Nuclear renal scans are useful in determining differential renal function and the degree of obstruction. Retrograde and antegrade pyelography remain valuable for precise delineation of the stricture length and severity.

Management depends on stricture length, location, and the degree of surrounding tissue damage. Initial decompression is often required in symptomatic patients, achieved through ureteral stenting or percutaneous nephrostomy. These methods provide immediate relief of obstruction and stabilization of renal function while definitive planning is undertaken. However, long-term stenting is generally not a definitive solution due to encrustation risk and discomfort.

Endoscopic management has limited success in radiation-induced strictures due to dense fibrotic tissue and poor healing capacity. Balloon dilation or endoureterotomy may be attempted in short strictures, but recurrence rates are high. These methods are typically reserved for patients who are poor surgical candidates or have minimal disease burden.

Reconstructive surgery is often required for durable correction. Ureteroureterostomy may be performed in short-segment proximal

or mid-ureteral strictures, provided that healthy tissue margins are available. However, radiation damage often extends beyond the visible narrowing, limiting the applicability of simple anastomosis.

Long-segment strictures present a greater challenge and may require more complex reconstruction. Substitution with bowel segments, most commonly ileal interposition, can restore urinary continuity when native ureteral repair is not feasible. This technique provides a functional conduit but introduces risks such as mucus production, metabolic imbalance, and potential infection.

Surgical planning in radiation-associated strictures is particularly demanding due to poor tissue quality. Fibrosis reduces tissue elasticity and vascularity, increasing the risk of anastomotic failure. Intraoperative assessment of tissue viability is critical, and wide excision of nonviable segments is often required to achieve healthy margins.

Renal function preservation is a key goal of treatment. Delayed intervention can result in irreversible nephron loss, emphasizing the importance of early detection and timely surgical referral. Even after successful reconstruction, some patients may experience gradual decline in renal function due to ongoing microvascular damage.

Emerging techniques in reconstructive urology are being explored to improve outcomes in radiation-induced injury. Tissue augmentation strategies, vascularized grafts, and regenerative approaches are under investigation to enhance healing in poorly vascularized fields. However, these remain largely experimental at present.

CONCLUSION

Ureteral strictures following radiation therapy represent one of the most complex reconstructive problems in urology. Successful management requires individualized planning, careful surgical technique, and long-term follow-up. While reconstruction can restore urinary continuity in many cases, treatment must be tailored to the extent of radiation damage and overall patient condition. Discussion should include potential need for staged surgery, long recovery periods, and possible requirement for long-term drainage or diversion.

Correspondence to: Isabella Morgan, Department of Urology, Coastal Oncology and Reconstructive Institute, Vancouver, Canada, E-mail: isabella.morgan@coastaloncorecon.ca

Received: 17-Nov-2025, Manuscript No. MSU-25-41473; **Editor assigned:** 19-Nov-2025, PreQC No. MSU-25-41473 (PQ); **Reviewed:** 03-Dec-2025, QC No. MSU-25-41473; **Revised:** 10-Dec-2025, Manuscript No. MSU-25-41473 (R); **Published:** 17-Dec-2025, DOI: 10.35248/2168-9857.25.14.413

Citation: Morgan I (2025). Surgical Management of Ureteral Strictures After Radiation Therapy. *Med Surg Urol*.14:413.

Copyright: © 2025 Morgan I. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.