Case report

DOI: <http://doi.org/10.4038/slju.v14i0.4090>

Buccal mucosa graft ureteroplasty for a long proximal ureteric stricture

M. Sivashankar¹ and A. C. N. Nandasena¹

¹Department of Urology, Colombo North Teaching Hospital, Ragama, Sri Lanka.

Key words: long proximal ureteric strictures, buccal mucosa graft

Introduction

Upper ureteric strictures commonly occur from ischemic injuries following previous surgical procedures and chronic inflammation (tuberculosis, amyloidosis) (1). While short strictures are managed with primary anastomosis, long strictures have limited options; substitution or autotransplantation, both associated with short and long-term morbidity. Treatment of long upper ureteric stricture is a challenging task for urologists, which is currently being managed with a substitution from the bladder, ileum, or appendix. In 1999, Naude described a novel technique for treating long strictures using a buccal mucosa graft with an omental wrapping, demonstrating a satisfactory outcome. Herein we report our first experience in using a buccal graft for a long ureteric stricture in the Sri Lankan urological practice.

Case presentation

A 65-year-old female was referred with fever and loin pain following a failed left pyelolithotomy performed a month earlier for 1cm renal pelvis calculus in a peripheral surgical hospital. An ultrasound scan showed moderate hydronephrosis of the left kidney. She had elevated C-reactive protein and Creatinine levels of 230 mg/L and 180 μ mol/L, respectively. Initially, percutaneous drain (PCN) was inserted and the left kidney was decompressed. Later, the antegrade and retrograde pyelograms were done, which demonstrated a long proximal ureteric stricture (Figure 1). Patient was explained and consented for re-exploration of the left ureter.

The left ureter was explored via the previous loin incision, and an upper ureteric stricture measuring 3cm was identified (Figure 2). Full-length stricturotomy was performed over the anterior surface of the unmobilised ureter, and the missed stone was removed through the upper end of stricturotomy site with the help of flexible cystoscopy. Subsequently, the ureteroplasty was done using a 4 cm $\times$ 2 cm buccal mucosa graft on-lay patch,

which was sutured to the margins of the long stricture over a 6Fr JJ stent using 4/0 polyglactin (Figure 3). The graft was buried into the local psoas muscle to enhance blood supply.

Figure 1. Retrograde and antegrade pyelogram showing long left upper ureteric stricture.

Figure 2. Intraoperative image showing long stricture segment, distal ureter hooked by infant feeding tube and 5Fr JJ stent traversing the stricture segment.

Figure 3. Intraoperative image showing buccal mucosal graft (marked arrow) placed over stricture segment.

On the 10th postoperative day, an ultrasound scan confirmed good urinary drainage and absent extravasation at the anastomotic site. She was subsequently discharged following an uneventful postoperative recovery. PCN was clamped and removed after two weeks, and the JJ stent was removed after six weeks. Follow-up retrograde pyelogram and ureteroscopy demonstrated total patency of the left ureter at the graft site at six months (Figure 4).

Figure 4. Postoperative retrograde pyelogram at six months is showing the patency of the tract.

Discussion

Long upper ureteric strictures with periureteric scarring are unsuitable for excision and primary end-to-end anastomosis; hence need substitution by ileal interposition or autotransplantation. These procedures are

associated with significant co-morbidity in short and long term. In the recent past, the successful use of buccal mucosal graft in reconstructing long ureteric strictures has led to an increasing interest in its versatility as an alternative substitution modality (1).

Powell et al. (1968) observed satisfactory urinary drainage in delayed phase films of intravenous pyelograms of patients with atonic ureters affected by schistosomiasis (2), which Naude further confirmed in 1984 (3). Based on these findings, Someville et al. substituted excised segments of the ureter with tubularized buccal mucosal grafts in baboons (4) with excellent engraftment results and upper tract drainage despite less than satisfactory excretory urograms. His subsequent report in 1999, following successful outcomes in six patients using the same technique, resulted in an increasing interest in popularising buccal mucosal grafts as a novel technique for treating long ureteric strictures.

Buccal mucosa has two specific histologic features; the thick non-keratinized epithelial layer and the highly vascular lamina propria. The rich vasculature of the lamina propria promotes graft uptake by imbibition, inosculation, and angiogenesis. Further, buccal grafts can be used both as a patch graft or a tubularized graft. The additional omental wrap provides an excellent vascular bed to enhance the graft uptake further.

Buccal graft ureteroplasty is a less complicated surgical technique with minimal complications compared to bowel interposition or autotransplantation. Moreover, it is considered a safer option in patients with compromised renal function which avoids metabolic complications.

There are few studies with similar techniques reported in the literature. Shah et al. reported a buccal mucosa graft with the omental wrapping for long ureteric strictures in five patients, out of which four of them were for renal tuberculosis and the other was amyloidosis. All strictures were more than 5 cm, and the post-surgical patency of ureters was found excellent (5).

Lee et al. analyzed 19 patients with long proximal ureteric strictures treated with buccal mucosa grafts, a multi-institutional experience in robotic ureteral reconstruction using buccal mucosa graft at three high volume centers between 2013 and 2016. The median length of stricture was 4 cm and 79% had on-lay technique with 95% of omental reinforcement resulting in 90% success rate (6).

Conclusion

This case highlights our initial experience with an on-lay patch buccal mucosa graft substitution for long upper ureteric strictures. The buccal mucosa graft ureteroplasty is a less complicated surgical procedure with minimal morbidity and good outcome. Further appraisal of this technique as a novel approach for reconstructing complex proximal ureteric strictures should be considered a reasonable discretion in the future.

References

1. Naudu JH. Buccal mucosal grafts in the treatment of ureteric lesion. *BJU international* 1999; 83: 751-4.
2. Powell SJ, Engelbrecht HE, Welchman NM. Hydronephrosis and urinary tract bilharzias: a radiological and necropsy survey. *Trans Roy Soc Tropical Med Hygiene* 1968; 62: 231-7.
3. Naude JH. The natural history of ureteric Bilharzia. *Br J Urol* 1984; 56: 599-601.
4. Somerville JJF, Naude JH. Segmental ureteric replacement: an animal study using a free non-pedicled graft. *Urol Res* 1984; 12: 115-19.
5. Shah SA, Ranka P, Visnagara M, Dodia S, Jain R. Use of buccal mucosa as On-lay graft technique for benign ureteric strictures. *Indian J Urol.* 2003; 20: 28-32.
6. Lee C Zhao et al. Robotic Ureteral Reconstruction Using Buccal Mucosa Grafts: A Multi-institutional Experience. *Eur urology* 2018; 73: 419-26.