



ONCOLOGY/RECONSTRUCTION

ORIGINAL ARTICLE

# The long-term results of lingual mucosal grafts for repairing long anterior urethral strictures



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## KEYWORDS

Anterior urethral stricture;  
Graft;  
Buccal mucosa;  
Urethroplasty;  
Lingual mucosa

## ABBREVIATIONS

BMG, buccal mucosa graft;  
LMG, lingual mucosa graft;  
 $Q_{max}$ , maximum urinary flow rate

**Abstract Objective:** To evaluate the long-term results of repairing long anterior urethral strictures with lingual mucosa onlay grafts.

**Patients and methods:** This study included 23 patients (mean age 36.3 years, range 21–62) who had a lingual mucosa onlay graft for managing a long anterior urethral stricture, and who were followed up for  $\geq 5$  years. The mean length of the stricture was 4.6 cm. The International Prostate Symptom Score and uroflowmetry values were obtained before surgery, and at 3, 6 and 12 months afterwards, and annually thereafter. A retrograde urethrogram with a voiding cysto-urethrogram was taken before surgery, at catheter removal, after 3 and 6 months, and selectively thereafter.

**Results:** The mean (range) follow-up was 66 (60–72) months. The cause of the stricture was trauma in nine patients, instrumentation in seven, idiopathic in four, urethritis in two and previous hypospadias repair in one. The surgery was successful in 20 of the 23 patients (87%), and a recurrent stricture developed in the remaining three. There were no fistulae or clinically perceptible graft sacculations, and no long-term donor-site complications.

**Conclusions:** With a long-term follow-up, our series confirms the durability of lingual mucosal onlay grafts for treating long anterior urethral strictures. This

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procedure results in a long-term high success rate with few of the complications that occur primarily during the first year.

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## Introduction

There are many surgical options for the repair of a urethral stricture and the choice is based on the stricture site, length, and the degree of spongiofibrosis. Bulbar urethral strictures <2 cm long are repaired by excision of the fibrotic segment, with end-to-end anastomosis of the healthy ends of the urethra, and the long-term results are good. Substitution urethroplasty is required to repair longer (>2 cm) urethral strictures, anterior strictures and multiple urethral strictures [1].

Currently the buccal mucosa graft (BMG) is the most popular choice for substitution urethroplasty, with a high success rate. It has also been used to repair complex hypospadias [2]. Although the use of the BMG to repair a urethral stricture was first reported by Humby in 1941 [3], the present widespread use has been attributed to reports by Burger et al. [4] and Dessanti et al. [5] in 1992. The BMG is characterised by a thick epithelium, thin lamina propria and a rich blood supply facilitating early inosculation. Other advantages of the BMG are resistance to infection, ease of harvest, no hair and a hidden donor site.

Simonato et al. [6] first reported the use of lingual mucosa as a substitution tissue for graft urethroplasty, with good results. Subsequent studies of the lingual mucosa graft (LMG) to repair urethral strictures reported good outcomes. These series were based on a short- and medium-term follow-up. To our knowledge there are no studies evaluating the long-term results of LMG urethroplasty. Thus in the present study we specifically evaluated the results and complications of LMG urethroplasty over an extended follow-up period.

## Patients and methods

The study included 23 patients (mean age 36.3 years, range 21–62) who had a long anterior urethral stricture that was repaired between April 2006 and October 2007, using an onlay LMG technique. All patients were evaluated by a history, clinical examination, urine analysis and culture, uroflowmetry, retrograde urethrography and voiding cysto-urethrography. Patients were excluded if they had a short stricture (<2 cm) or a history of oral pathology or surgery. We verified that the study was conducted according to the requirements of World Medical Association Declaration of Helsinki (1964) and further recommendations.

The repair was carried out by two teams, one exposing the stricture and the other harvesting the lingual

mucosa. Povidone-iodine oral rinses were used by the patients 2 days before surgery and continued for 6 days afterwards. The urethroplasty was performed under general anaesthesia with nasotracheal intubation. The patients with bulbar strictures were placed in the lithotomy position, while those with penile strictures were laid supine.

### Harvesting the LMGs

A mouth opener was used and the tongue was pulled outside the mouth with a Babcock clamp, exposing the tongue's ventrolateral surface. The site of the graft was from ventral to lateral mucosa of the tongue. Initially the graft was marked with a surgical pen, with care to avoid injury to the opening of the submandibular duct (Wharton duct) at the base of the tongue on the side of the frenum linguae. We infiltrated the graft site with normal saline and 0.01% adrenaline. We incised the graft edges with a scalpel and a full-thickness mucosal graft was harvested using scissors (Fig. 1). The graft bed was carefully examined for bleeding and closed using polyglactin 3–0 running sutures (Fig. 2). The graft



Figure 1 Excision of the graft edge.

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