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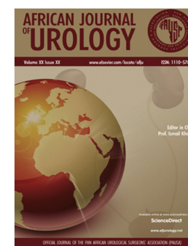

Review

One-stage and two-stage penile buccal mucosa urethroplasty

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Abstract
The paper provides the reader with the detailed description of current techniques of one-stage and two-stage penile buccal mucosa urethroplasty. The paper provides the reader with the preoperative patient evaluation paying attention to the use of diagnostic tools. The one-stage penile urethroplasty using buccal mucosa graft with the application of glue is preliminary showed and discussed. Two-stage penile urethroplasty is then reported. A detailed description of first-stage urethroplasty according Johanson technique is reported. A second-stage urethroplasty using buccal mucosa graft and glue is presented. Finally postoperative course and follow-up are addressed.

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Introduction

The surgical repair technique for a penile urethral stricture is mainly related to the stricture etiology. A great difference in penile stricture etiology exists between developed and developing countries.

In developed countries, lichen sclerosus (LS) and failed hypospadias repair (FHR) are now reported as the main causes of penile urethral strictures and there has been a decrease in post-infectious strictures and an increase of instrumentation and catheter related strictures [1–3]. On the contrary, in developing countries recurrent gonococcal urethritis remains an important cause of strictures, but there also seems to be a trend of decreasing urethritis and an increase of instrumentation and catheter related strictures in these countries as well [4–6].

The repair of penile urethral strictures may require one- or two-stage urethroplasty [7–10]. Certainly, sexual function can be placed at risk by any surgery on the penile urethra and the dissection must avoid interference with the neurovascular supply to the penis and the use of flaps or grafts should not compromise penile length, should not cause penile chordee and should not affect penile appearance.

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Whenever possible, the repair of penile strictures should be done using a one-stage procedure, saving the patient the discomfort of the two-stage procedure which entails an abnormal site of the external urinary meatus and noticeable changes in esthetic penile appearance. Unfortunately, in some patients the use of a two-stage procedure is mandatory because the meatus and navicularis urethra are almost completely obliterated with marked wood-hard fibrosis extending into the proximal part [9]. Also, the majority of patients with FHR presenting with obliterative strictures associated with fistulae, scarring, chordee, abnormal meatus, small glans and deficiency of the dartos layer may require a two-stage procedure [9].

As far as penile urethral reconstruction there are two main questions still open in the literature: in one-stage repair it is better to use a flap or a graft? And, in two-stage repair, when and how should a buccal mucosa graft be used?

We describe here, step by step, our current techniques of one-stage and two-stage penile buccal mucosa urethroplasty including the preoperative patient evaluation and postoperative course and follow-up. The aim of this study is to make these safe techniques easily reproducible in the hands of any surgeon.

Subjects and methods

Pre-operative evaluation of patient

The clinical history of the patient and etiology of the penile stricture should be fully evaluated. Patients with histological proven LS presenting obliterative meatal, navicularis and distal penile strictures may require complete excision of the diseased urethral segment which should be replaced with buccal mucosa in a 2-stage repair (Fig. 1A–C) [7–10]. In patients with LS, the use of buccal mucosa at the first stage is mandatory because LS does not affect the oral mucosa [7–10]. Patients with a history of FHR presenting obliterative strictures associated with fistulae, scarred penile skin, chordee, abnormal meatus, small glans and deficiency of the dartos layer may require a two-stage repair, using the buccal mucosa only in the second stage. The majority of patients presenting penile strictures not related to LS or FHR are good candidates for one-stage urethroplasty using a graft or flap. Before planning the surgical approach it is mandatory to perform a retrograde and voiding urethrography and to perform a calibration of the external urinary meatus by the progressive insertion of 10, 12, 14, 16 F Nelaton catheters. It is very important to establish before the surgery if the stricture involves the meatus and the navicularis tract.

Preparation of patient for surgery

Three days prior to surgery, the patient should begin using chlorhexidine bidet for genitalia cleansing twice a day. The day before surgery the patient receives intravenous prophylactic antibiotics.

Surgical techniques

One-stage penile urethroplasty using buccal mucosa graft and glue

The patient is intubated through the nose, allowing the mouth to be completely free. The patient is operated by 2 surgical teams working simultaneously, each having its own set of surgical instruments. The oral mucosa graft is harvested from the cheek according to our standard technique used with more than 553 patients [11]. The graft is tailored according to the site, length and characteristics of the stricture. The patient is placed in a simple supine position. A suture is placed in the glans to stretch the penis. In strictures involving the external urinary meatus and extending into the distal part of the penis, the penile urethra is approached by circular sub-coronal incision and penile degloving. In more proximal

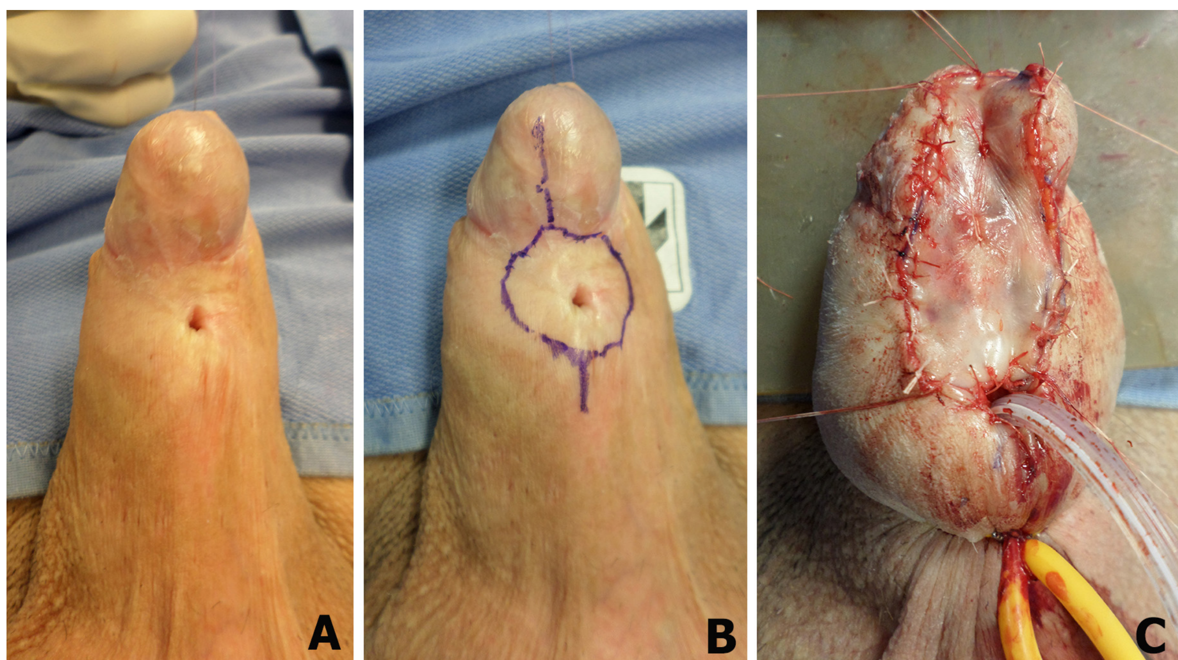

Figure 1 (A) Patient with lichen sclerosus recurrent after repeated meatotomy. (B) Margins of tissue to be removed. (C) Appearance of the penis after the first stage of buccal mucosa graft urethroplasty.

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