

Urethroplasty for balanitis xerotica obliterans

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Objective To review the results of different methods of urethroplasty for anterior urethral strictures caused by balanitis xerotica obliterans (BXO).

Patients and methods Twenty-eight patients underwent urethroplasty for BXO; 12 had a one-stage pedicled penile skin-flap urethroplasty and 16 excision and a two-stage free-graft urethroplasty using nongenital skin.

Results The treatment failed in all patients undergoing

a one-stage pedicle penile skin urethroplasty because the disease recurred with BXO, whereas the treatment failed in only one patient using a two-stage free graft procedure.

Conclusion A two-stage free-graft urethroplasty using nongenital skin is recommended for anterior urethral strictures caused by BXO.

Keywords Balanitis xerotica obliterans, BXO, urethroplasty, urethral stricture, outcome

Introduction

Balanitis xerotica obliterans (BXO) is a form of lichen sclerosus et atrophicus (LSA) affecting the genital skin of the prepuce and glans [1]. It is widely recognized as a common cause of phimosis and meatal stenosis [2,3]. There have been three reports of BXO affecting the urethra, one of which reported a single case [4] and in total, only 10 instances of anterior urethral stricture are described [5,6], five of whom had a urethroplasty, and all of whom benefited. In only one report [4] was a recurrent stricture reported and in one other case, from a pathologist, a recurrent stricture after a urethroplasty was described [7]. This is not our experience and we report a comparison of urethroplasty methods in the treatment of BXO.

Patients and methods

Twenty-eight patients with BXO were treated by one of two different types of urethroplasty within the last 15 years. The first group consisted of 12 patients (mean follow-up 5 years) who underwent a stricturotomy and pedicled penile skin-flap urethroplasty, such as the Orandi [8] procedure or a variant of the penile flap urethroplasty described by Quartey [9] and Mundy and Stephenson [10]; i.e. all had surgery using local genital skin.

The second group consisted of the remaining 16 patients who underwent excision of the diseased segment and a two-stage free-graft urethroplasty, using full thickness postauricular skin grafts in 12 and buccal mucosa

in four in whom postauricular skin was not available as a result of a previous mastoidectomy [11].

Nearly half the patients in each group (five of the 12 in group 1 and 10 of the 16 in group 2) had undergone previous anterior urethral surgery using local genital skin, and all but one patient had undergone meatal surgery. In addition, two of the patients in group 2 required excision of the skin of the glans and resurfacing with a split skin graft, one of whom also required excision of the skin of the shaft of the penis and resurfacing, for severe deformity as a consequence of unusually extensive disease.

Results

All 12 urethroplasties using genital skin failed and all of these patients underwent further surgery. In one patient this involved occasional urethrotomy, and the remaining 11 underwent two-stage urethroplasty using nongenital skin. Generally, all patients developed a retracted meatus and palpable thickening of the urethra within 2 years of their surgery, and these features were usually apparent before the patient noticed a deterioration of their urinary stream. All 11 of those who underwent a repeat urethroplasty failed to respond to one or more urethrotomies beforehand. These 11 had the diseased segment excised (including the urethroplasty) and had two-stage urethroplasties, 10 of whom have fared well during a short-term follow-up. These 11 are not included in the 16 who constituted group 2. Of these 11, seven of the revision procedures were postauricular Wolfe grafts and four were buccal mucosal grafts; the recurrence was in one of the postauricular Wolfe grafts.

Within a mean follow-up of 3 years, there was only

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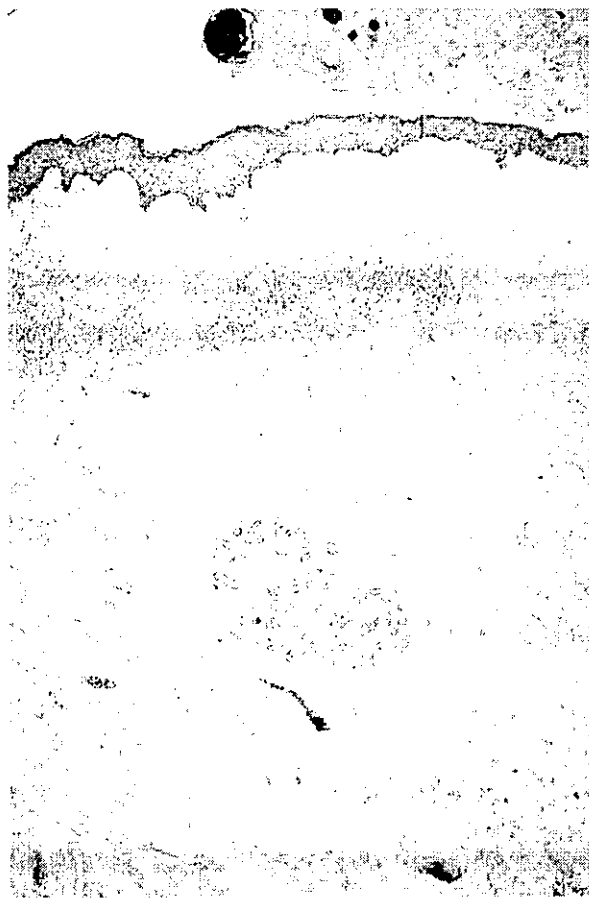


Fig. 1. Excised penile skin urethroplasty showing the histological features of BXO, including epidermal atrophy with degeneration of the basal layer of epithelium, and below this oedema, hyalinization, inflammation and reduction in elastic fibres.

one recurrent stricture in the 16 patients who underwent two-stage urethroplasty using nongenital skin, occurring in a patient treated with a postauricular Wolfe graft. Histological assessment of the urethra and, when present, a previous urethroplasty, uniformly showed the features of BXO (Fig. 1), although only half the patients were evaluated histologically.

In the two patients who had recurrent strictures after a two-stage procedure, one primary and one revision, both had had full-length penile urethral disease and a previous urethroplasty, both had postauricular Wolfe grafts, and both had recurrent disease at the junction of the graft with the bulbar urethra. They have so far been managed with occasional urethrotomy; neither has been biopsied.

Discussion

We conclude that when urethroplasty is required for BXO, nongenital skin should be used, as the disease

seems always to recur in genital skin urethroplasties. Whether the disease will recur in nongenital skin remains to be determined, although two recurrences in a total of 19 postauricular Wolfe grafts suggests that it might, albeit with a lower incidence. There is one report of a recurrence in a urethroplasty using genital skin [4] and one of recurrence in nongenital skin [7], but these two isolated reports do not reflect the true situation. Interestingly, there has been no recurrence in any of the eight buccal mucosal grafts used so far, within 1–3 years of follow-up, although this is obviously a very small group. On the other hand, although the length of follow-up is short, it is within the time when recurrence due to BXO would be expected to become apparent.

It is not clear whether recurrent BXO represents extension of the disease due to local phenomena affecting genital skin or the Koebner phenomenon of recurrence of any skin condition in traumatized skin, trauma in this case being the skin flap or graft. The Koebner phenomenon has been described in a similar situation, but again only once, and in LSA rather than BXO [12].

It is possible that the better results in the second group undergoing two-stage procedures might be partly related to the excision of the diseased tissue and protracted exposure before the second-stage closure. Exposure of the glans by circumcision appears to improve glanular BXO in most patients. On the other hand, all the present patients have been followed for a minimum of one year, during which the urethra was again closed, moist and exposed to urine, so any benefit from the interim exposure might be expected to be lost, if these are relevant aetiological factors. Whether excision of the diseased urethra is relevant can only be speculative.

Interestingly, although the disease extends into the bulbar urethra in some cases, urethral BXO in most is confined to the penile urethra, but nonetheless involves all of the penile urethra; we have no explanation for this observation. Several authors have suggested that urethral strictures in BXO proximal to the meatus are not caused by BXO but by the trauma of repeated instrumentation [3]. Indeed, the first report of BXO strictures of the anterior urethra [5] did not give histological details, although subsequent reports have [7]. The present histological data suggest that all extensive urethral involvement, with or without a genital skin urethroplasty, is caused by BXO.

For a condition that has been so rarely reported in the literature, BXO is quite common; the present 28 patients represent over a quarter of our 114 patients undergoing anterior urethroplasty for nontraumatic conditions, and over half our 53 penile urethroplasties. Even allowing for the selection bias of our patient population, these are substantial proportions. It has been described by Rickwood *et al.* [13] as accounting for all cases of

phimosis if the foreskin is sent for histological examination, which is not usually the case. This is a common condition that regularly affects the anterior urethra as well as the foreskin and glans, and regularly causes recurrent stricturing when standard one-stage local skin flap urethroplasties are used to treat it.

Most of the present patients waited 6–9 months between the first and second stages, which is the same for all patients undergoing two-stage urethroplasties whatever the reason. Four required a single revision of the proximal urethrostomy (there was no distal urethrostomy). This interval revision rate (14%) is the same as that for patients without BXO. Taken together, these observations suggest that a two-stage procedure *per se* does not make a difference to the outcome, but using nongenital skin does, and excision of the disease and replacement of the entire urethra by this means, rather than retaining the diseased urethra and restoring its calibre, might be another important factor in the outcome.

Two of the present patients and one further patient operated on by one of the authors elsewhere has also required glans resurfacing because of devastating external damage to the glans and penile skin, in addition to the devastating internal damage caused by extensive and recurrent stricturing. The requirement for glans resurfacing has been described by Bracka (personal communication), who also noted a high incidence of recurrence of BXO in genital skin urethroplasties. Thus, BXO appears to be a much commoner and more extensive disease than previously reported, and requires particular care in its treatment.

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