The Nontransecting Approach to Bulbar Urethroplasty

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KEYWORDS

• Urethral stricture • Urethroplasty • Urethral reconstruction

KEY POINTS

- The standard treatment for bulbar urethral strictures of appropriate length is excision and primary anastomosis (EPA), involving transection of the corpus spongiosum (CS).
- Recent evidence suggests there is a significant risk of sexual dysfunction and, potentially, of other adverse consequences as a result of transection of the CS.
- The authors have developed a technique of nontransecting anastomotic urethroplasty coupled with stricturoplasty, which seems to be just as effective as EPA.
- The authors also describe a stepwise "nontransecting approach" to all bulbar strictures, based on the cause of the stricture except those due to straddle injuries.
- EPA remains appropriate for strictures following straddle injuries.

INTRODUCTION

Most strictures in men arise in the bulbar urethra unless there is some obvious factor in the patient's history, such as pelvic trauma, or surgery for hypospadias, to indicate otherwise.[1–3] Iatrogenic strictures are common in the bulbar urethra, mainly due to catheterization or instrumentation, but the commonest group in the so-called developed world is described as "idiopathic," although some would regard them as congenital in origin[1,4–8]: an important point that will be discussed later.

Idiopathic strictures are generally short and sometimes only a membrane. They tend to be located at the junction of the proximal and middle thirds of the bulbar urethra (**Fig. 1**). When they first present, before any iatrogenic damage from instrumentation, they are associated with a minimal amount of fibrosis in the surrounding corpus spongiosum (CS).[9]

For many years, the surgical treatment of these patients, if they have failed to respond to first-line management by urethral dilatation or visual internal urethrotomy, has been excision of the stricture and end-to-end anastomosis, commonly known as excision and primary anastomosis or EPA.[10,11] This procedure has been reported to have a very high success rate and a very low incidence of side effects or complications,[10–13] but recent evidence and expert opinion suggest that there is a significant risk of potentially avoidable sexual dysfunction associated with the procedure.[14–18] This risk is attributed to transection of the CS.

Various authors, including the authors of this article, have observed that although EPA may be extremely effective (sexual dysfunction aside),

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Urol Clin N Am 44 (2017) 57–66
http://dx.doi.org/10.1016/j.ucl.2016.08.012

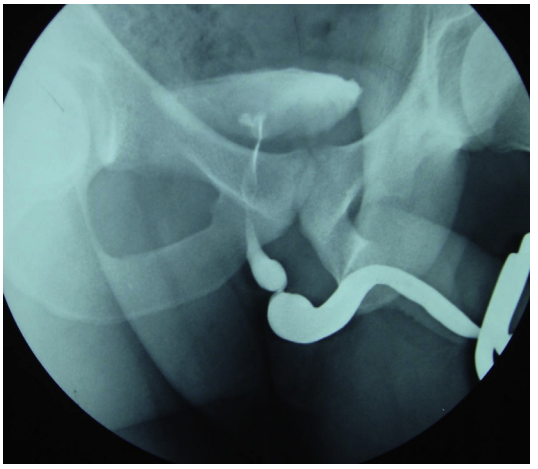

Fig. 1. Urethrographic appearance of a typical idiopathic stricture: typical in both length and location.

the amount of fibrosis excised with the stricture is actually very small, except after straddle injuries, and that the bulk of the CS, on transection, is healthy and, indeed, can bleed vigorously.[19–21] This observation casts doubt on the rationale for transection of the whole of the CS when only a small part of it is involved in the disease process.

In addition, Jordan and colleagues[19] noted that there are circumstances in which transection of the urethra may not be ideal, such as when a patient subsequently needs surgery for carcinoma of the prostate and develops postprostatectomy sphincter weakness incontinence for which he needs an artificial urinary sphincter to correct it, in which case the cuff of the artificial urinary sphincter and the effects of the previous EPA may compromise each other. They therefore developed an approach to proximal bulbar strictures to avoid transecting the urethra.[19,22]

The authors' own experience of approaching almost all longer bulbar strictures by a dorsal stricturotomy, with a view to patching them with a buccal mucosal graft (BMG), is that the stricture is usually easily visible on the inside of the urethra and not usually associated with much spongiofibrosis. Indeed, some strictures are so short that it is possible just to do a Heineke-Mickulicz type of stricturoplasty (HMS).[23,24] Hence, the authors were led, with strictures that were more than just a membrane but were still short enough to make it feasible, to try and excise the stricture and the associated spongiofibrosis intraurethrally (leaving the bulk of the CS intact) and simply restore epithelial continuity by stitching the epithelial margins together. The repair would then be completed by closing the dorsal stricturotomy incision with a stricturoplasty.

In 2012, the authors published their initial experience with this approach[18] and reported further follow-up data and their increasing experience since.[25–27] The authors have stressed that this is "an approach." The fundamental premises have been that bulbar strictures are usually short and that there is little in the way of spongiofibrosis except after straddle injury—in which case excision and end-to-end anastomosis would be appropriate. Otherwise, the authors approach the stricture surgically in the same way in all patients. They mobilize the bulbar urethra, perform a dorsal stricturotomy, and then inspect the urethra from the inside. If the stricture is amenable to local excision and repair of the stricture intraurethrally, the authors do so or otherwise do a dorsal patch urethroplasty, usually using a BMG as described by Barbagli,[28,29] and now more properly, if less precisely, described as an augmented bulbar urethroplasty.[30]

This review describes and updates the authors' experience with such an approach, including the development of an augmented nontransecting technique to deal with more complex bulbar strictures.

PATIENTS AND METHODS

Between January 2009 and December 2014, the authors performed 405 bulbar urethroplasties, excluding staged repairs and perineal urethrostomies. Seventy-two of these were standard EPA procedures, in other words, transecting in the traditional way. Fifty-eight of these 72 patients had suffered straddle injuries of the bulbar urethra, and the remaining 14 patients were either revisional cases or had developed gross fibrosis as a result of infection. In almost all cases, the need for an EPA could be predicted from the patient's clinical features and imaging.

Of the remaining 333 patients, 232 had a relatively long stricture, usually as a result of or made worse by instrumentation, and were treated by a dorsal buccal mucosal graft patch urethroplasty (DBMGPU) (**Fig. 2**). The other 101 patients had relatively shorter strictures, usually idiopathic and without so much previous instrumentation. They had a dorsal stricturotomy and a stricturoplasty, or a nontransecting excision of the stricture and a stricturoplasty or an augmented nontransecting approach,- as described in later discussion. As with the "EPA group," the dorsal stricturotomy approach in these 333 patients was almost always predictable preoperatively even though the exact procedure could only be decided by the operative findings, as described in later discussion.