Urethral stricture repair, irrespective of the underlying etiology, has been a challenge for urologic surgeons for decades. However, surgical techniques are continually evolving and the overall success rates keep improving.

Focusing on bulbar urethroplasty, the most common causes in the industrialized countries are external trauma and prior instrumentation. Short bulbar urethral strictures measuring <2.0–2.5 cm in length are generally repaired by excision and end-to-end anastomosis with excellent results. Longer urethral strictures require open substitution urethroplasty, which is considered to be the gold standard treatment [1]. Urethral substitution procedures are achieved by using non-penile skin, penile skin (flaps or free grafts), or bladder or buccal mucosa. Although penile flaps are preferable in the pendulous urethra, most authors recommend grafts in the bulbar region [2]. Still under debate is the question of which tissue is particularly suitable for grafts. Alsikafi et al reported of an overall success rate of 84% (mean follow-up, 201 mo) and 87% (mean follow-up, 48 mo) for penile skin urethroplasty and buccal urethroplasty, respectively, without a significant difference. Gozzi et al treated almost 200 patients with genital and extragenital skin grafts and reported excellent results. On the other hand, Barbagli et al favored the buccal mucosa approach. In this study a success rate of 84% for buccal mucosa grafts was reported (mean follow-up, 42 mo), whereas penile skin graft had a failure rate of 27%; however, the mean follow-up was much longer at 71 mo [3]. Despite the lack of long-term results most authors recommend buccal mucosa grafts in single-stage complex bulbar urethral stricture repair with initial success rates of 89–100% [4–6], although there is considerable controversy in the literature. Because urethral substitutes such as buccal mucosa or free foreskin grafts do not have their own blood supply, the success and survival of the graft depends on the absorption of nutrients from well-vascularized corpus spongiosum (imbibition phase) and subsequent ingrowth of capillaries (inosculation phase) from the same anatomic structure [7,8]. In extended bulbar strictures a 3–4-cm augmented roof strip anastomosis may be necessary. The major point of this surgical technique, first described by Russell in 1914, is the excision of all or most of the diseased urethra. Subsequently, reconstruction of the urethra is performed by reanastomosing the dorsal ends and a free graft is augmented, dorsally.

A controversial issue has been the location of the graft on the urethra surface, but it has been shown that either positioning of the graft (ventral, dorsal, lateral) has provided the same success rates and stricture recurrence [9].

In this issue of the journal, El-Kassaby and colleagues [10] present their 10-yr experience with one-stage repair of long bulbar urethral strictures using augmented dorsal strip anastomosis in >234 cases. They address several major points in bulbar urethroplasty, which are of clinical importance and of great value for the readers.
Focusing on the extension, bulbar urethral strictures had a mean of 4.2 cm of which a mean of 2.8 cm diseased urethral segment was excised and replaced by a mean buccal mucosa patch graft of 4.7 cm. Keeping these figures in mind, almost every bulbar stricture may be managed with the modification of Russell’s technique. No penile shortening or chordee formation was observed. The overall success rate exceeded 93%. The need for excision with full tube replacement with a high incidence of anastomotic strictures may be reserved for a few selected cases. The recent renaissance of buccal mucosa in reconstructive urology is due to the constant availability, easy harvesting, and favorable immunologic properties such as resistance to infection. The tissue characteristics of buccal mucosa with thick epithelium, high content of elastic fiber, and thin lamina propria promoted the wide acceptance in graft urethroplasty for complex hypospadias and urethral stricture repair, with generally favorable outcomes. Excellent results in the use of buccal mucosa have been confirmed by El-Kassaby and colleagues with a mean follow-up of 36 mo and a personal experience of >10 yr. In their series no major intraoperative complications at the donor site major were encountered and temporary perioral numbness resolved completely within 5 wk. There is still some controversy whether to place the patch graft ventrally or dorsally. The rationale for using a dorsal graft is the better support by the underlying corpora cavernosa to avoid pseudodiverticulum formation and sacculation of the graft. Also, the dorsal onlay may offer a better bed for the graft take, possibly reducing restrictre rates [4]. On the other hand, El-Kassaby demonstrated very convincing outcomes in favor of the ventrally placed graft in which the support is achieved by spongiosplasty together with the bulbospongious muscle and Colles fascia.

Several protocols have been reported in the follow-up of urethral reconstruction. Most urologists propose an initial follow-up examination at 6 and 12 mo after surgery and yearly thereafter. For the detection of all recurrences, follow-up evaluations are probably necessary for up to 5–10 yr after surgery. As a matter of fact, failure of surgery is mostly a result of ischemia. This may due to poor blood supply or tension at the anastomosis. Therefore, surgical failure occurs within a few weeks or months. If patients are asymptomatic with a normal urethrocystogram and a normal urinary flow rate at 3 mo after surgery, they will almost certainly be satisfactory thereafter. In this condition, the mean follow-up of 36 mo (range: 12–75 mo) is by all means enough to certify excellent mid- to long-term results.

In conclusion, almost every bulbar urethral and even proximal pendulous stricture may be managed by the augmented (buccal mucosa graft) strip anastomosis. When corpus spongiosum is not abundant to cover the graft via spongiosplasty one alternative is to apply the dorsal onlay augmented procedure by circumferential mobilization of the urethra and dorsal incision of the stricture, followed by a full-thickness graft placement directly onto the tunica albuginea. The dorsal approach is ingenious and represents a useful addition to the surgical armamentarium. The preservation of the urethral plate should be attempted in every single case of bulbar urethral stricture as graft onlay urethroplasty or as augmented urethroplasty to avoid complete tube replacement (eg, pedicled penile skin flap) or multistage procedures. Finally, if all other options fail, the mesh graft procedure may be the only way to reconstruct urethral passage.

References