

Editorial

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Urethroplasty: current techniques and management of complications

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Urethroplasty has always been a challenge in genitourinary surgery; urethral reconstruction (primary or redo) is one of the most critical functional requests. In recent decades, many urethroplasty techniques and their modifications have been published. Primary repair is indicated for congenital abnormalities of the urethra, such as hypospadias or epispadias, the most frequent anomalies with urethral defects. One of the essential aspects of urethroplasty is urethral stricture disease, and there is much discussion about the etiology, location, length, and management. Despite recent improvements, the management of urethral stricture disease remains a challenging problem. Successful management is based on detailed knowledge of the anatomy, pathophysiology, and proper procedure selection tailored for each case.

This special issue represents a comprehensive and multidisciplinary review of urethroplasty for congenital anomalies or urethral stricture disease resulting from various etiological entities. Our contributors prepared original research and review articles to clarify the etiology, modalities of surgical treatment, and outcomes after urethral reconstruction. We present a special issue with eight excellent papers enabling precise and valuable guidelines for urethral reconstruction covering almost all aspects of this entity.

In “Tunneled tubularized bladder mucosal graft for long urethral reconstruction”, El Ghoneimi *et al.* described one of the recent modalities for urethroplasty using a graft of the bladder mucosa. Even though



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the oral mucosa is the gold standard for urethral stricture repair, other options are becoming more popular, including grafts from bowel or bladder mucosa. This paper introduces new modalities with good outcomes and minor postoperative complications.

One of the most common congenital anomalies is hypospadias. Numerous papers have been published on the topic in recent decades. Epispadias is a challenging congenital anomaly of the penis and urethra, and only a few surgical procedures have been published recently. Dr. Bizic, in her paper entitled “Epispadias: recent techniques”, summarizes the knowledge of this anomaly with special attention to urethral reconstruction in one or two stages. One-stage primary repair is always tricky but produces the best outcomes. Another option for staged epispadias repair presents a suitable variant, especially in cases without available genital tissue and in severe forms. Finally, redo surgery in adults after failed primary repairs in childhood is a new avenue for transitioning urology and offering the best possible aesthetic and functional outcomes.

Dr. Martins and his group presented the essential elements of flap and graft tissue that are well-known for stricture repair in “Combined grafts and flaps in urethral stricture repair”. They confirmed that various grafts and flaps have been paramount for urethral stricture repairs and should remain an option for reconstructive surgeons. Combined use of a graft with hairless skin flaps could be the best option for a safe, predictable, and long-lasting approach in single-stage urethroplasty due to complex urethral stricture disease. The authors concluded that further randomized studies would be helpful to support one technique over another. Having a comprehensive armamentarium and choosing the best treatment for each patient is essential.

In “Genital flaps for anterior urethral reconstruction”, the group from UCSF led by Breyer described using genital grafts for anterior urethral strictures. They focused on genital skin flaps, particularly those derived from penile skin, based on their vascularization, harvesting, and characteristics. The authors described all possibilities, including longitudinal, transversal, ventral, and dorsal penile skin flaps. They concluded that penile skin flaps play an important role in anterior urethral reconstruction in appropriately selected patients.

“Flaps for bulbar urethral ischemic necrosis in pelvic fracture urethral injury” from the Indian group explains the definition of bulbar urethral ischemic necrosis as an iatrogenic entity resulting from repeated attempts at anastomotic urethroplasty for pelvic fracture urethral injuries. Vascular etiology due to compromised blood supply of the bulbar urethra results in a compromised or complete absence of a segment of the bulbar urethra. Urethral stricture is presented as a long narrowing, semi-obliteration, or the absence of a segment of the bulbar urethra. The authors described the complete etiology, diagnostic methods, and treatment options and concluded with recommendations for prevention or its management. Special consideration should be taken for cases of urethral reconstruction in patients after phalloplasty. Primary urethroplasty is always associated with a complex vascular supply of the neophallus derived from anastomotic or non-anatomic flaps. This is the primary difference in urethral reconstruction between the penis and neophallus.

In “Management of urethral strictures after masculinizing genital surgery in transgender men”, the Mount Sinai transgender group reviewed options for urethral stricture repair after neophalloplasty urethral reconstruction. They confirmed previously reported outcomes of high rates of urethral strictures in their patients and recommended further research to identify better solutions.

A completely different issue is post-radiation urethral stricture, which occurs in more than 30%. Its management presents a challenge for reconstructive urologists and remains a challenge for patients who desire improvement of quality of life by avoiding permanent urethral or suprapubic catheterization. In the Guerass review entitled “Post irradiation urethral stricture”, all aspects of this critical problem are discussed; the authors conclude that the treatment should be performed by experienced reconstructive surgeons adept at using different grafts or flaps as treatment options. To avoid management failure, particular attention should be taken to understanding the characteristics of irradiated tissues.

Even though female urethral stricture is rare, several publications suggest a heightened interest in the reconstructive urology community. DeLong *et al.* reviewed etiology and different therapeutic options according to the guidelines of leading urological societies. Their management ranges from simple non-surgical to complex reconstructive procedures. The authors reported all surgical options, advantages, and disadvantages and recommended new protocols. In “Female urethral stricture: techniques for reconstruction”, they concluded that technology such as tissue engineering could improve the treatment of this challenging problem.

The exciting “nature” of urethral stricture disease suggests the need for the creative combination of various techniques and strategies, often involving tissue transfer procedures, either as grafts or as flaps, to achieve successful outcomes. Various tissues such as oral mucosa, genital or extragenital skin, and bowel and bladder mucosa have been used for urethroplasty. In cases of preserved and healthy penile skin, genital skin flaps present another option for achieving a successful outcome. Finally, tissue-engineered substitutes for the human urethra present a new frontier.

Finally, based on the established principles of reconstruction, as we push forward in this challenging art, we need to adapt to growing demands for publishing new techniques, modifications, long-term results, and future challenges.

DECLARATIONS

Authors' contributions

Made substantial contributions to the conception and design of the study and performed data analysis and interpretation: Djordjevic ML, Purohit RS

Performed data acquisition and provided administrative and technical support: Djordjevic ML, Purohit RS

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