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Diagnosis and management of urethral diverticulum in children

Cholas Jeric**Department of Urology, University of Gothenburg, Gothenburg, Sweden***✉ Cholas Jeric***Department of Urology,
University of Gothenburg,
Gothenburg, Sweden,
E-mail: cholasjer@gmail.com*

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Description

Urethral diverticulum in children is an uncommon but clinically significant condition that requires careful attention to ensure accurate diagnosis and effective management. It represents a localized outpouching of the urethral wall, which can lead to various symptoms and complications if left untreated. While more commonly described in adults, particularly in women, urethral diverticulum in the pediatric population poses unique challenges due to anatomical and developmental considerations.

The diagnosis of urethral diverticulum in children is often delayed or missed because of its nonspecific and variable presentation. Symptoms can range from recurrent urinary tract infections and urinary incontinence to dysuria and post-void dribbling. In some cases, the condition may remain asymptomatic and only be discovered incidentally during evaluations for other urological issues. The lack of specific clinical signs and the overlap of symptoms with other urinary tract conditions underscore the importance of maintaining a high index of suspicion when evaluating pediatric patients with persistent or unexplained lower urinary tract symptoms.

Imaging plays a central role in the diagnosis of urethral diverticulum in children. Ultrasound is often the first-line modality, as it is non-invasive, widely available and effective in identifying diverticular sacs. High-resolution Voiding Cystourethrography (VCUG) is another commonly used diagnostic tool, providing dynamic imaging of the urethra and bladder during micturition. In cases where the anatomy is particularly complex or when additional detail is needed, Magnetic Resonance Imaging (MRI) offers superior soft-tissue contrast and can delineate the diverticulum and surrounding structures with greater accuracy. Each imaging technique has its advantages and limitations and the choice often depends on the individual patient's needs and the resources available.

Once diagnosed, the management of urethral diverticulum in children is guided by the severity of symptoms, the size and location of the diverticulum and the presence of complications such as infection or obstruction. In asymptomatic cases, conservative management with observation may be appropriate, especially if the diverticulum is small and unlikely to cause significant issues. Regular monitoring is essential in such cases to ensure that the condition does not progress or lead to complications over time.

For symptomatic patients, surgical intervention is the treatment of choice. The primary goal of surgery is to excise the diverticulum and reconstruct the urethra to restore normal function while minimizing the risk of recurrence or other complications. The choice of surgical technique depends on the location and complexity of the diverticulum. Open surgical approaches, while effective, may involve significant recovery times and potential risks associated with larger incisions.

Minimally invasive techniques, such as endoscopic or laparoscopic surgery, have gained popularity in recent years due to their reduced morbidity and faster recovery times. However, their applicability in pediatric cases is still being explored, and outcomes can vary based on the surgeon's expertise and the specific anatomical challenges.

Postoperative care is a critical component of successful management. Patients require close monitoring for signs of complications, such as infection, urethral stricture, or recurrence of the diverticulum. Early identification and management of these issues are vital to ensure good long-term outcomes. Urodynamic studies and follow-up imaging can help assess the functional success of the repair and detect any residual or recurrent abnormalities. Additionally, providing clear instructions to caregivers regarding hygiene and symptom monitoring can contribute significantly to the child's recovery and overall well-being.

A multidisciplinary approach to managing urethral diverticulum in children is essential, involving pediatric urologists, radiologists and, in some cases, pediatric surgeons and nephrologists. This collaborative effort ensures that the child receives comprehensive care tailored to their specific needs. Moreover, continued research and innovation are essential for advancing our understanding of the condition and refining diagnostic and therapeutic strategies.

Conclusion

The diagnosis and management of urethral diverticulum in children present unique challenges that require a nuanced and individualized approach. By combining clinical vigilance, advanced imaging and surgical expertise, healthcare providers can improve outcomes and enhance the quality of life for affected children. Ongoing advancements in minimally invasive techniques and a growing emphasis on personalized care offer hope for further improving the management of this rare condition in the pediatric population.