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<http://www.pediatricurologycasereports.com>**Current trends in surgical treatment of pediatric stone disease****Mesrur Silay****Department of Urology, Istanbul Medeniyet University, Istanbul, Turkey.*✉ **Mesrur Silay***Department of Urology,
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Description

Pediatric stone disease, characterized by the formation of calculi in the urinary tract of children, poses a significant healthcare challenge worldwide. The rising incidence of pediatric stone disease necessitates the continuous evolution and refinement of treatment strategies. While conservative management and medical interventions have been effective in certain cases, surgical interventions play a crucial role in managing complex and recurrent stone disease in children. This commentary article explores the recent advancements in surgical treatment modalities for pediatric stone disease and highlights the paradigm shift in management. Pediatric stone disease is a condition that affects children of various age groups, from infancy to adolescence. The etiology of stone formation in children can differ from that in adults, necessitating a tailored approach to diagnosis and treatment. Factors such as metabolic disorders, urinary tract anomalies, and dietary habits contribute to stone formation in pediatric patients. The severity of symptoms and the potential for complications underscore the need for timely intervention, making

surgical treatment an integral part of the management strategy. Historically, surgical treatment of pediatric stone disease relied on open surgical procedures such as pyelolithotomy and ureterolithotomy. While effective, these invasive procedures were associated with prolonged hospital stays, increased morbidity, and extended recovery periods. The introduction of minimally invasive techniques revolutionized the field, offering safer and more efficient alternatives. Extracorporeal Shock-Wave Lithotripsy (ESWL) employs shockwaves to fragment stones, allowing their subsequent passage through the urinary tract. This non-invasive procedure significantly reduced the need for open surgery in pediatric stone disease cases. However, limitations in stone size, location, and composition restrict the universal application of ESWL. Retrograde intrarenal surgery (RIRS) involves the insertion of a flexible ureter scope through the urethra and bladder to reach the stones within the renal pelvis or calyces. Laser lithotripsy is then used to fragment and remove the stones. RIRS has emerged as a safe and effective option for treating smaller stones in the pediatric population, providing high stone clearance rates with minimal morbidity. Percutaneous Nephrolithotomy (PCNL) involves the creation of a tract through the skin and renal parenchyma to access and remove stones in the kidney. This procedure is particularly useful for larger stones and complex cases, allowing comprehensive stone clearance in a single session. Advancements in technology and instrumentation have further improved the safety and efficacy of PCNL in pediatric stone disease management. Ureteroscopic lithotripsy (URS) has proven to be an effective modality for managing

ureteral stones in children. The use of smaller calibre ureter scopes, improved optics, and laser lithotripsy techniques have enhanced the success rates and reduced complications associated with URS. It is particularly useful for distal ureteral stones, providing high stone clearance rates and minimizing the need for additional procedures. Antegrade URS involves accessing the upper urinary tract through a percutaneous nephrostomy tract, thereby allowing endoscopic treatment of stones located in the renal pelvis or upper ureter. This approach offers a safe and efficient alternative to PCNL in selected cases, providing excellent stone clearance rates and minimizing the invasiveness of the procedure.

Conclusion

Surgical treatment plays a crucial role in the management

of pediatric stone disease. It offers effective and definitive solutions for the removal of urinary stones in children, ensuring the restoration of urinary tract function and prevention of long-term complications. Surgical techniques, such as ureteroscopy and percutaneous nephrolithotomy, have evolved significantly, allowing for minimally invasive procedures with high success rates and reduced morbidity. The selection of the most appropriate surgical approach should be based on the stone characteristics, patient age, and anatomical considerations. While conservative measures and medical interventions remain important in pediatric stone disease management, surgical interventions remain a cornerstone in providing optimal care and improving the quality of life for children suffering from this condition.