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Transient Postoperative Megacystis Following Pyeloplasty in an Infant without Bladder Outlet Obstruction

Peige Jalkanen*

Department of Pediatric Urology, University of Sao Paulo, Sao Paulo, Brazil

✉ ***Peige Jalkanen***
Department of Pediatric Urology,
University of Sao Paulo,
Sao Paulo, Brazil
E-mail: peigejalkanen098@gmail.com

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Description

Postoperative bladder dysfunction is an uncommon but clinically significant phenomenon observed in infants undergoing upper urinary tract surgery. While ureteropelvic junction obstruction is one of the most frequent congenital anomalies requiring surgical correction in early infancy, postoperative complications typically involve the site of repair rather than the bladder itself. However, transient postoperative megacystis may occur, presenting as bladder overdistension without mechanical obstruction, and poses a diagnostic and management challenge. A four-month-old male infant was referred for evaluation of left-sided hydronephrosis identified on prenatal ultrasound. Postnatal imaging confirmed moderate hydronephrosis with preserved differential renal function, and open pyeloplasty was scheduled and successfully performed.

The surgical procedure involved dissection and excision of the stenotic segment of the ureteropelvic junction, followed by spatulated ureteral reimplantation into the renal pelvis using fine absorbable sutures. Intraoperative inspection confirmed no abnormality of the bladder or ureter distal to the repair. The immediate postoperative course was uneventful, with adequate urine output *via* a urethral catheter placed intraoperatively. The infant was extubated without complication and transferred to the pediatric ward for routine monitoring.

Within 48 hours postoperatively, nursing staff noted progressive abdominal distension, decreased urine output, and suprapubic fullness despite the presence of a catheter. Ultrasonography revealed marked bladder enlargement with normal bladder wall thickness and no evidence of hydronephrosis of the ipsilateral kidney. The urethra appeared patent, and the distal ureters were unremarkable. Serum creatinine remained within normal limits, and there was no evidence of electrolyte imbalance or infection. A trial of gentle catheter drainage confirmed large post-void residual volumes, yet there was no mechanical obstruction to explain the bladder overdistension.

Urodynamic assessment was performed to evaluate detrusor function and bladder compliance. The study demonstrated reduced detrusor contractility with delayed onset of contraction, normal bladder compliance, and absence of detrusor-sphincter dyssynergia. There was no evidence of outlet obstruction, posterior urethral valves, or neurogenic dysfunction unrelated to surgical stress. These findings suggested a transient imbalance in autonomic bladder regulation, potentially related to perioperative factors, local edema, or reflex inhibition secondary to surgical manipulation of the upper urinary tract.

Management was conservative, focusing on bladder decompression, supportive care, and careful monitoring of renal function. A Foley catheter was maintained for short-term drainage, and timed intermittent clamping

was initiated to promote detrusor activity. Over the subsequent days, the infant tolerated increasing intervals of spontaneous voiding with decreasing residual volumes. Serial ultrasonography demonstrated gradual reduction of bladder capacity toward age-appropriate volumes. No urinary tract infection or metabolic complication was observed during this period.

By four weeks postoperatively, the infant was voiding spontaneously with normal volumes and frequencies. Follow-up ultrasonography confirmed normalization of bladder size and preserved renal parenchyma. Serum creatinine remained stable, and urinalysis was unremarkable. The parents reported no voiding dysfunction, incontinence, or abdominal discomfort. At three- and six-month follow-ups, bladder capacity and voiding patterns were within normal limits, demonstrating complete recovery from the transient postoperative megacystis.

The pathophysiology of transient bladder dysfunction following pyeloplasty remains incompletely understood. Several mechanisms have been proposed, including reflex inhibition of detrusor contraction secondary to renal pelvic decompression, temporary autonomic dysregulation, local edema affecting bladder afferent pathways, and disruption of neural signaling during upper tract manipulation. Infants may be particularly susceptible due to immature detrusor innervation and limited bladder capacity. Importantly, these changes appear to be self-limited and resolve with conservative management, emphasizing the need for careful observation rather than immediate invasive intervention.

This underscores the importance of recognizing transient postoperative megacystis as a benign but potentially alarming phenomenon. Prompt identification and supportive care can prevent unnecessary surgical procedures and avoid prolonged catheterization. Close monitoring of urine output, renal function, and bladder capacity through noninvasive imaging is essential to ensure recovery and prevent secondary complications such as infection or renal impairment.

From a clinical perspective, pediatric urologists should maintain a high index of suspicion for transient functional bladder disturbances in the immediate postoperative period following upper tract surgery. Differentiation from mechanical obstruction or neurogenic bladder is critical and can be achieved through a combination of imaging, catheterization, and urodynamic evaluation. Early reassurance and conservative management are often sufficient to restore normal bladder function and support optimal long-term outcomes.

Conclusion

Transient postoperative megacystis is a rare but important consideration following pyeloplasty in infants. Awareness of this entity, careful monitoring, and conservative management strategies allow for full recovery without compromising renal function. Recognition of functional bladder disturbances in the postoperative period can prevent unnecessary interventions, provide guidance for caregivers, and optimize outcomes in pediatric patients undergoing surgical correction of upper urinary tract anomalies. This case adds to the limited literature on transient bladder dysfunction after pyeloplasty and emphasizes the need for vigilance and tailored postoperative care in this vulnerable population.