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Bladder Calculus Formation around a Forgotten Feeding Tube Fragment in a Child with Neurogenic Bladder

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Description

An eleven-year-old boy with spina bifida and neurogenic bladder was admitted to a pediatric urology department because of recurrent suprapubic pain, cloudy urine, intermittent gross hematuria, and increasing difficulty during catheterization. The patient had undergone myelomeningocele repair during infancy and had required clean intermittent catheterization since early childhood. His parents reported that urinary infections had become more frequent over the previous year despite adherence to catheterization schedules and prophylactic antibiotic therapy.

Three months before presentation, the child had been treated at a local clinic for accidental blockage of a urinary catheter. During that episode, emergency decompression of the bladder was attempted using a temporary infant feeding tube because an appropriate catheter size was unavailable. The family recalled difficulty removing the tube afterward, although the patient initially appeared stable following the procedure. At admission, physical examination demonstrated mild suprapubic tenderness

without abdominal guarding. The patient was afebrile but appeared uncomfortable during bladder palpation. Neurological findings remained unchanged from prior examinations related to spinal dysraphism. Laboratory analysis revealed microscopic hematuria, pyuria, and alkaline urine. Urine culture identified *Proteus mirabilis* sensitive to amikacin and ciprofloxacin. Blood chemistry values showed preserved renal function.

Computed tomography of the pelvis confirmed a laminated bladder stone surrounding a tubular foreign body consistent with a retained fragment of feeding tube material. The calculus occupied a substantial portion of the bladder lumen and partially obstructed the catheterization pathway. Because of stone size and underlying neurogenic bladder dysfunction, endoscopic treatment was considered technically difficult. Open cystolithotomy was therefore selected. Preoperative antibiotic treatment was initiated according to urine culture sensitivity. Under general anesthesia, a lower midline incision was performed to access the bladder. After cystotomy, a large irregular stone was identified adherent to the bladder mucosa. Careful extraction revealed a fragmented segment of feeding tube at the center of the calculus. The foreign body measured approximately 6 cm in length and showed significant encrustation. Bladder mucosa surrounding the stone demonstrated inflammatory edema without perforation or necrosis.

The bladder cavity was irrigated extensively to remove residual debris. Inspection identified no additional

foreign material. A suprapubic catheter and urethral catheter were placed to maintain urinary drainage during healing. Stone analysis later revealed predominant magnesium ammonium phosphate composition consistent with infection-related calculus formation. Postoperative recovery was favorable. Gross hematuria resolved within forty-eight hours, and suprapubic discomfort disappeared completely. Intravenous antibiotics continued for five days before transition to oral therapy. Follow-up ultrasonography prior to discharge demonstrated resolution of hydronephrosis and absence of residual calculi.

During outpatient review three months later, the patient remained free of urinary infection and catheterization proceeded without difficulty. Repeat imaging confirmed normal bladder emptying for his baseline neurogenic condition. Family counseling emphasized strict avoidance of improvised catheter materials and the importance of immediate specialist evaluation during catheter-related emergencies. Bladder stone formation secondary to retained foreign bodies represents an uncommon but clinically important complication in pediatric urology. Children with neurogenic bladder face elevated risk because of chronic catheterization, urinary stasis, recurrent infection, and altered bladder dynamics. Foreign material within the bladder acts as a nidus for mineral deposition, particularly in the presence of urease-producing organisms such as *Proteus* species. Infection played a major role in calculus development in this patient. Urease-producing bacteria increase urinary alkalinity, promoting precipitation of magnesium ammonium phosphate crystals. Over time, progressive mineral deposition around the retained tube fragment

generated a large bladder stone capable of causing outlet obstruction and upper urinary tract dilatation.

Choice of treatment depends on stone size, foreign body composition, and patient anatomy. Endoscopic lithotripsy may succeed in selected cases involving smaller calculi. However, open cystolithotomy remains appropriate for large stones, particularly in children with neurogenic bladder or altered urinary anatomy. Complete removal of all foreign material is essential because retained fragments may lead to recurrent stone formation. Preventive strategies remain especially important for children requiring lifelong catheterization. Education of caregivers regarding appropriate catheter equipment, sterile technique, and prompt management of catheter malfunction may reduce avoidable complications. Access to specialized pediatric urology services also contributes to safer long-term care.

Conclusion

Foreign body-related bladder calculi may occasionally produce severe complications including bladder perforation, chronic infection, urethral injury, or renal impairment. Fortunately, early surgical management in this patient prevented irreversible upper urinary tract damage. Continued surveillance remains necessary because children with neurogenic bladder retain elevated lifetime risk of urinary stone recurrence. Bladder stone formation around a retained feeding tube fragment in a child with neurogenic bladder. The case demonstrates how improvised urinary devices may result in significant urological morbidity when foreign material remains within the bladder. Open cystolithotomy achieved complete symptom resolution and restored effective urinary drainage in this patient.