Endourology and Stone Disease

Urethral Stone Disease Leading to Retention After Hair-bearing Neophalloplasty

Robert Viviano a,*, Bradley A. Morganstern b, Adam O'Toole a

a Department of Surgery, Nassau University Medical Center, NY, USA
b Arthur Smith Institute of Urology, North Shore-Long Island Jewish Health System, NY, USA

A R T I C L E   I N F O

Article history:
Received 23 December 2013
Received in revised form
5 January 2014
Accepted 12 January 2014

Keywords:
Phalloplasty
Reconstruction
Urolith
Retention

A B S T R A C T

A 35-year-old male patient with a past history of traumatic penile amputation and subsequent penile reconstruction with a radial artery free flap phalloplasty presented to the urology clinic for urinary retention and complaint of a firm penile mass. The patient had been lost to follow-up for 2 years before this presentation. Patient had a suprapubic tube in place from initial surgery, with imaging showing 2 large uroliths encrusted around the end. Urethral stricture was suspected in the patient. On cystoscopy, an additional obstructing urolith was found in penile urethra, appearing to have formed in situ.

Introduction

Historically, those who had penile amputation have been pushed toward gender reassignment surgery because of the poor outcomes of historic attempts at phalloplasty. Since the first radial artery free flap (RAFF) phalloplasty technique was performed in 1984, the number of patients with full phalloplasty has been rising, and the challenges and complications of treatment within this patient population have become worthy of study. The use of hair-bearing skin for the phalloplasty carries extra complications because of the introduction of skin epithelial elements into a previously urothelium-exclusive environment. These patients are generally followed up very closely, as the complications of such a major surgery are frequent and often requiring quick correction. We present a case of a patient who presented after > 2 years of no follow-up for complications of his procedure.

Case presentation

The patient is a 35-year-old male with a past medical history of assault with traumatic amputation of penis and testicles in February 2011. The patient had no other medical, surgical, or social history. In May 2011 a RAFF phalloplasty was performed. Patient course after initial repair was complicated by wound dehiscence and fistula formation with stricturing. At this time, the patient voided per suprapubic tube. The patient had extensive urology follow-up and was planned for suprapubic tube removal, when the patient was lost to follow-up. The patient returned to clinic 2 years later complaining of insidious onset severe dysuria and episodic retention of increasing frequency over multiple months. The patient states he has been voiding spontaneously from the neophallus for almost 2 years with retention being only a recent issue. Suprapubic tube is nonfunctioning and on previously trying to self-extubate the suprapubic catheter, the patient discovered he could not remove it. The patient also complained of a firm midurethral mass in neophallus. Retention was partially or fully resolved by manipulation of the mass, per patient.

The patient underwent computed tomography, which showed 2 bladder stones of 4.4 × 3.6 and 1.8 × 1.0 cm and a 0.9 × 0.6 cm hyperdense mass in urethra (Fig. 1). The patient was scheduled for cystoscopy of neophallus and bladder and an open cystolithopaxy. A restrictive urethral diameter required the use of the ureteroscope to perform cystoscopy. At cystoscopy, a calculus was encountered in the penile urethra of the neophallus corresponding to the density previously identified. The calculus was fractured with holmium laser, and the remainder of the urethra appeared clear of calculus, stricture, or diverticuli. Within the bladder, a large calculus was observed forming around the suprapubic tube and a second stone free in the bladder. At this time cystoscopy was ended, and open...
litholapaxy was begun. Both stones were removed from the surgically incised bladder, and the bladder was closed without placement of a suprapubic tube.

After surgery, a 16F Foley catheter was placed through the urethra with mild resistance. Patient recovery was uncomplicated, and a retrograde cystourethrogram 2 weeks later would show an intact bladder and patent urethra. The patient currently urinates without issue.

Discussion

This case represents the long-term outcome of unmonitored complications in a patient with a neophallus from a hair-bearing donor site. The patient had a previous history of multiple fistula formation and stricture formation in the time frame shortly after the operation, but it was the 2-year lost to follow-up that allowed other adverse events to develop so fully. The initial approach to surgery in this patient was to strongly consider a perineal urethrotomy to assure continued continence, as the urethral stone was not expected and stricturing (reported at 5.3%–6.7% rate) or fistula (at 10.5%–33.3%) was predicted. Initially, it was believed stricture would be the most likely reason for retention in this patient, but it appears a calculus secondary to a hairball nidus initiated the retention.

As an additional nidus for calculus formation, the retained suprapubic tube became the center of a nearly 5 × 4 cm stone (Fig. 2), possibly larger if the second bladder stone is included. The urethral stone is a distinct finding from the bladder stones, as it was far too large to have passed through the prostatic urethra without significant discomfort, something the patient denied. The patient likely developed the urethral stone at the site it was located (Fig. 3). The formation of urethral stones in hair-bearing neourethras has been documented as a rare outcome of all hair-bearing urethral reconstructions, although with no reported occurrences in RAFF phalloplasty. In this patient, the urethral calculus formed a source of complete urinary obstruction, a novel finding, which could be relieved with manipulation of the stone. Despite urethral stones of any size being rare, it is important to not overlook them as a non-stricturing etiology that can explain acute or chronic retention in RAFF phalloplasty patients.

Definitive management would involve urethral depilliation, and multiple techniques from electrocautery to laser ablation to thioglycolate solution have been described. However, this treatment was deferred in our patient because of the history of fistula formation. It has been hypothesized that self-catheterization once a week can prevent calculi formation. This technique may be used as an alternative for those with contraindications to definitive therapy.

Most patients would have frequent urologic follow-up for the duration of their life and would not reach a state of calculus, which could obstruct the urethra. Given the presence of hair-bearing epithelium is foreign to the urothelial system, some level of calculus formation could be assumed to be the natural progression in any unmonitored patient. There needs to be larger study of the long-term sequelae of these surgeries to be certain that stone formation and eventual obstruction are a natural progression in those with poor follow-up.
Conclusion

This case represents multiple late-term complications of a radial free-arm flap phalloplasty, including a stone forming primarily within the urethra. As reconstructive techniques continue to improve, urologists will be seeing increasing number of surgically repaired or recreated organs, which carry their own unique differential diagnosis for even the most common of urologic complaints, retention. This case can serve as a guide for what long-term sequelae can be expected in these patients and should serve as a basis for future study in this patient population.

References

1. Krishnakumar KS, Petkar KS, Lateef S, Vyloppilli S. Penile replantation. Indian J Plast Surg. Jan–Apr 2013;46:143–146.
2. Garaffa G, Ralph DJ, Christopher N. Total urethral construction with the radial artery-based forearm free flap in the transsexual. BJU Int. 2010;106:1206–1210.
3. Garaffa G, Raheem AA, Christopher NA, Ralph DJ. Total phallic reconstruction after penile amputation for carcinoma. BJU Int. 2009;104:852–856.
4. Kampantais S, Dimitriadis C, Laskaridis I, Perdikis I, Kirtsis P, Toutziaris C. Urethral hairballs as a long term complication of hypospadias repair: two case reports. Case Rep Urol. 2012:2012. Article online ahead of print.
5. Hayashi Y, Yasui T, Kojima Y, Maruyama T, Tozawa K, Kohri K. Management of urethral calculi associated with hairballs after urethroplasty for severe hypospadias. Int J Urol. 2007;14:161–163.