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Comparison of laparoscopic excision versus open transvesical excision for symptomatic prostatic utricle in children

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ABSTRACT

Purpose: The aims of this study were to report our clinical experience with laparoscopic excision (LE) and to compare the outcomes of LE versus open transvesical excision (OTE) for the management of prostatic utricle (PU) in children.

Patients and methods: This was a retrospective single-center study of 14 children who underwent OTE or LE for managing symptomatic PU between April 2003 and December 2014. Age, utricle size, operative time, estimated blood loss, duration of hospital stay, indwelling time of the urethral catheter, presence of residual postoperative utricular stump, and complications were compared between the two groups.

Results: There were no significant differences in age or utricle size between the two groups. Compared to the OTE group, the LE group experienced shorter operative times, lower estimated blood losses, and shorter hospital stays. Indwelling time of the urethral catheter was nearly 8 days in the OTE group and 6 days in the LE group. All patients had a follow-up visit between 6 months and 2 years after surgery. Two patients in the OTE group had transient UTI. Postoperative VCUG showed minimal residual utricular stump for 3 patients in the OTE group. However, no patient in either group required further operative therapy.

Conclusions: LE is a safe and feasible procedure for symptomatic PU in children. Compared to OTE, LE can provide minimally invasive access for achieving good exposure with good short-term outcomes.

Prostatic utricle (PU) is an enlarged midline diverticulum in the posterior urethra of males. Although not a common genital anomaly, PU is frequently observed in patients with severe hypospadias or intersex syndrome [1]. Although most PU patients are asymptomatic, more than 29% may manifest some clinical symptoms in childhood as a result of the utricle size or urinary tract infection (UTI) [2]. When enlarged because of reflux with urine, PU may be associated with recurrent UTI, epididymo-orchitis, urinary retention, dysuria, and post-voiding dribbling. Surgical excision is considered the best treatment approach for symptomatic patients. Many open surgeries have been described for the management of PU, including perineal, extravesical, and posterior sagittal transrectal procedures [1,3–6]. However, these procedures frequently do not offer good exposure of utricles located in the deep pelvic cavity, leading to an increased incidence of operative damage and difficulty with complete excision [1,7]. Open transvesical excision (OTE) is a more advantageous approach to the treatment of this pathology, as it permits good exposure and has a lower complication rate [2,8].

Recently, Chung Yeung and colleagues recommended the use of laparoscopic excision (LE) for managing symptomatic PU [9]. This minimally invasive procedure couples an excellent surgical view of the deep pelvic structures with good functional results [10]. Our center has made some improvements of the LE technique. In this paper, we report a retrospective review of our clinical experience with LE and compare the outcomes of LE versus OTE for the management of PU in children.

1. Patients and methods

1.1. Study population

Between April 2003 and December 2014, 14 boys (age: 9 months to 9 years) who underwent OTE or LE for symptomatic PU at our center were retrospectively reviewed. Inclusion criteria for this study were as follows: PU of grade II with clinical symptoms (Fig. 1a). Exclusion criteria were PU of grade 0, I, or III, and PU without clinical symptoms.

All patients had hypospadias, which was perineal in 7 patients (50.0%), penoscrotal in 5 patients (35.7%), and midshaft in 2 patients (14.3%). Karyotyping revealed karyotypes of 46XY in 11 patients (78.6%) and 45XO/46XY mosaic in 3 patients (21.4%). Obvious symptoms of PU were present before hypospadias repair in 3 patients (21.4%) and after hypospadias repair in 11 patients (78.6%). Patients

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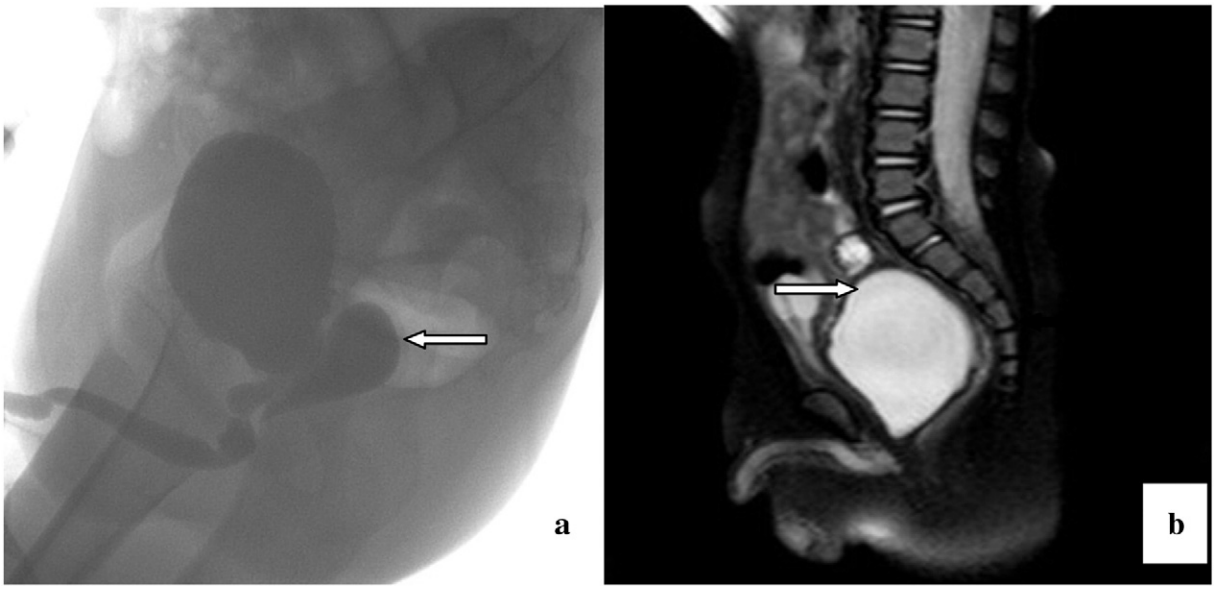

Fig. 1. a VCUG showing a PU (white arrow) behind the bladder in patient no. 3. The lesion communicated with the posterior urethra. b MRI showing a large PU (black arrow) behind the bladder in patient no. 5 (white arrow, catheter sacculus).

displaying symptoms concerning for PU were submitted to voiding cystourethrography (VCUG). Diagnosis of PU was made according to clinical symptoms and VCUG findings. The grading scheme described by Ikoma et al. was applied to classify PU into 4 grades, on the basis of the VCUG results [11]: grade 0, opening located on the posterior urethra, but the utricle does not extend over the verumontanum; grade I, opening is larger than in grade 0, but does not reach the bladder neck; grade II, opening is larger than in grades 0 and I, and the dome extends over the bladder neck; grade III, opening is situated in the bulbous urethra just distal to the external sphincter.

Patient characteristics are summarized in Table 1. The study was approved by the institutional review board of our medical center. All parents gave written informed consent for the surgical procedures. In the follow-up period, we gave the cosmesis survey, together with LE and OPE wound photos, to parents of LE patients. We asked parents to choose which photo showed better cosmesis.

1.2. Study design

Before 2010, OTE was performed to excise utricles in 8 consecutive patients at our center. After 2010, LE was used for 6 consecutive patients. All patients were treated by a single surgeon and followed up with clinical and radiological (VCUG) assessments. Age, utricle size, operative time, estimated blood loss, duration of hospital stay, indwelling time of the urethral catheter, postoperative residual utricular stump, and complications were compared between the two groups.

1.3. Surgical procedure

1.3.1. OTE

Patient was placed in the supine position, and a urethroscope was inserted directly into the PU under light guidance. The bladder was opened through a 5-cm modified Pfannenstiel incision, and both ureters were splinted. The longitudinal incision was deepened through the trigone of the bladder wall, and the PU was exposed by confirmation of the urethra with a catheter. The PU was mobilized up each side and opened to identify communication with the urethra. When we encountered the vas deferens entering into the bottom of the PU during the procedure, part of the cyst wall was reserved to avoid direct injury or ligation of the vas deferens. In such cases, ligation was performed after communicating with the patient's parents.

After extirpation of the PU, the stump was closed on a urethral stent tube by running sutures with 4/0 Vicryl, and the trigone was sutured with interrupted 3/0 chromic catgut. The bladder was closed in 2 layers. A urethral catheter was indwelt for 8 days after the operation.

Table 1
Patient characteristics.

Case	Age (months)	Symptoms	Associated anomalies	Utricle size (cm)	Follow-up (months)
1	66	UTI	Perineal hypospadias	3.5	24
2	45	Postvoiding dribbling, UTI	Perineal hypospadias	3	24
3	88	Postvoiding dribbling, UTI	Penoscrotal hypospadias	4	24
4	35	Ipsilateralepididymo-orchitis	Perineal hypospadias	2.5	24
5	33	UTI	Perineal hypospadias	2.8	24
6	56	UTI	45XO/46XY, penoscrotal hypospadias	3.2	24
7	78	Ipsilateral epididymo-orchitis	Penoscrotal hypospadias	5	24
8	100	UTI	Penoscrotal hypospadias	3	24
9	36	Dysuria, UTI	45XO/46XY, perineal hypospadias	2.7	24
10	38	UTI	Penoscrotal hypospadias	2.5	24
11	110	Postvoiding dribbling	Midshaft hypospadias	3	24
12	48	Pelvic mass, ipsilateral epididymo-orchitis	45XO/46XY, penoscrotal hypospadias	5	18
13	16	Urinary retention, pelvic mass, ipsilateral epididymo-orchitis	Midshaft hypospadias, micropenis	8	12
14	65	Bilateral epididymo-orchitis	Perineal hypospadias	4	6