



## A new approach for persistent cloaca: Laparoscopically assisted anorectoplasty and modified repair of urogenital sinus



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### ABSTRACT

**Purpose:** The aim of this study is to describe the surgical technique and evaluate midterm outcomes of the technique: laparoscopically assisted anorectoplasty (LAARP) and modified repair of urogenital sinus.

**Method:** Seven patients with persistent cloaca underwent LAARP and modified repair of urogenital sinus between November 2005 and December 2010. The ages of the patients at the time of operation were 6 months to 15 years. Distal colostogram and micturating cystogram were performed preoperatively to identify the type of persistent cloaca. The rectal pouch was above the pubococcygeal line in all patients. The operations were carried out using 3 trocars. CO<sub>2</sub> pressure was maintained at 8–12 mm Hg.

**Result:** Laparoscopically assisted anorectoplasty and modified repair of urogenital sinus were successfully performed in all cases. Mean operation time was 125.7 ± 8.4 minutes (range, 110–135 minutes). Intraoperative blood loss was minimal. There were no intraoperative complications. Follow-up was obtained in all patients. The median follow-up period was 5.7 ± 2.1 years (range, 4–9 years). Mucosal prolapse occurred in 2 cases (28.6%). No urethrovaginal fistula, acquired anorectal atresia or urethral injury was observed. Only 1 patient (14.3%) was incontinent of urine occasionally but urine retention or vesicoureteral reflux was not observed. Two patients (28.5%) had 2–4 stools per day but no social problem. Only 1 patient (14.3%) had constipation and required laxatives.

**Conclusion:** Anoplasty, vaginoplasty and urethroplasty can be performed simultaneously in patients with persistent cloaca through LAARP and modified repair of urogenital sinus.

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Persistent cloaca is the most severe form of anorectal malformation (ARM) encountered in girls. The incidence is approximately 1 in 50,000 live births [1]. The common channel of persistent cloaca varies from 1 cm to 10 cm. Those cases with a common channel longer than 3 cm are predicted with the higher incidence of complications [2]. The main goal of surgical reconstruction is achieving fecal and urinary continence and normal sexual function in adult life. The repair of persistent cloaca represents a serious technical challenge. Posterior sagittal approach (PSARP) and total urogenital mobilization (TUM) are still the standard surgical procedures for the repair of this anomaly [3,4]. For patients with a common channel greater than 3 cm, a laparotomy is usually required. To minimize the surgical invasion, we developed a new approach: laparoscopically assisted anorectoplasty (LAARP) and modified repair of urogenital sinus.

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Since November 2005, laparoscopy-assisted anorectoplasty and modified repair of urogenital sinus have been performed in our hospital for children with persistent cloaca.

The aim of this study was to describe the technique and evaluate midterm outcomes of this approach.

### 1. Patients and methods

#### 1.1. Patients

Seven patients with persistent cloaca underwent LAARP and modified repair of urogenital sinus between November 2005 and December 2010. Distal colostogram and micturating cystogram were performed preoperatively to identify the type of persistent cloaca (Fig. 1). The rectal pouch was above the pubococcygeal line in all patients. The ages of the patients at the time of operation ranged from 6 months to 15 years. Follow-up period varied between 4 and 9 years. Six patients (85.7%) had colostomy during the neonatal period (Table 1). Six patients had associated anomalies (85.7%), including genital (85.7%), urinary tract (28.6%) and spinal abnormalities (42.9%) (Table 2).

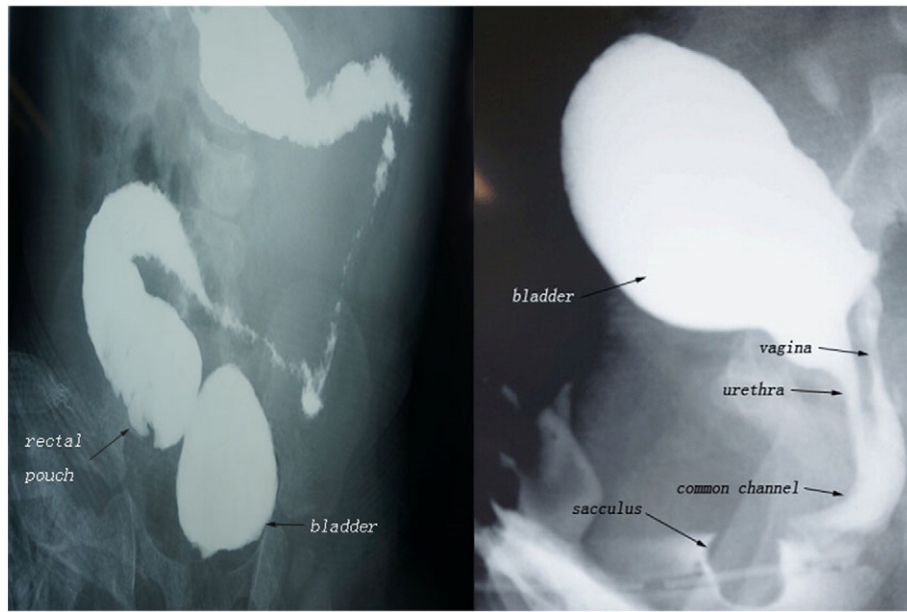


Fig. 1. Distal colostogram and micturating cystogram.

1.2. Surgical technique

The operation was carried out using 3 trocars from November 2005 to December 2010. A 5 mm trocar through the umbilicus for the 30° laparoscope (26046BA, Karl Storz GmbH & Co. KG, Tuttlingen, Germany), a 3 mm trocar at the left iliac fossa and a 3 mm trocar at the right iliac fossa for instruments.

The patient was placed in Trendelenberg position. CO<sub>2</sub> pressure was maintained between 8 and 12 mm Hg. The bladder was emptied using a urinary catheter. Laparoscopic rectal dissection begun at the distal sigmoid mesocolon and rectal mesentery. The terminal branches of the sigmoid and rectal arteries were divided to gain adequate bowel length. A stay suture was placed through the abdominal wall to help retract the uterus out of the way if the rectal pouch was dilated. The circumferential dissection around the rectal pouch was performed until the junction of the fistula and urogenital sinus was identified (Fig. 2A). The fistula was clipped with Hem-o-lock as close to the urogenital sinus as possible and then divided (Fig. 2B). If the fistula was too wide to be closed with Hem-o-lock, we would transfix the fistula with PDS suture. Special care was taken to avoid the injury to the left ureter. After dissection of the rectal pouch, the pelvic floor was inspected and the levators were identified with a neuromuscular electrical stimulator (Fig. 3).

The legs were elevated and the perineum was exposed. The center of external sphincter contraction was identified as the anoplasty site using a neuromuscular electrical stimulator. A midline skin incision was made over the planned anoplasty site. The neuromuscular electrical

stimulator was used again to identify the center of the external sphincter. A tunnel through the center of the sphincter complex was created using artery forceps under the laparoscopic guidance. The created tunnel was dilated with Hegar dilator up to 12 mm. The separated rectal pouch was pulled down through the muscle complex to the perineum without tension. Anoplasty was performed with absorbable interrupted 5-0 PDS (PDS\*II,Z148, Ethicon Inc., US) suture.

The repair of the urogenital sinus was then performed. Only the posterior and lateral walls of the urogenital sinus were dissected and mobilized through perineal approach in our procedure. The lateral walls were opened longitudinally to the urethral and vaginal orifices, and divided into two parts. The tissue of the common channel was used to extend the urethra and vagina. The anterior walls of common channel was left intact and the anterior part of the lateral walls were mobilized to extend the length of urethra by wrapping around an F8 urinary catheter and approximated to one another posterior to the catheter with 6-0 PDS (PDS\*II,Z148, Ethicon Inc., US) suture (Fig. 4). The posterior and lateral walls of the common channel were dissected (Fig. 5A). Effectively, the vagina length was extended by approximating the common channel lateral walls wall using 6-0 PDS suture (Fig. 5B). A 5 mm septum between the urethra and the vagina was reconstructed by approximating the tissue on each side. The openings of the reconstructed urethra and vagina were sutured to the skin (Fig. 6).

Anal dilation was started on postoperative day 14 and continued for 2 months. The urethral catheter was removed after performing micturating cystogram on postoperative day 10. The colostomy was closed 2 months postoperatively when the anus had reached the desired size. Micturating cystogram and distal colostogram were routinely performed prior to colostomy closure.

Table 1

Patient characteristics.

Patients	Age at operation (y)	Operative time (min)	Postoperative stay (d)	Colostomy	Length of common channel (cm)	Length of follow-up (y)
1	1	110	6	Yes	2.4	6
2	15	130	6	No	3	8
3	2	130	5	Yes	2	4
4	0.5	135	5	Yes	1.5	9
5	0.5	130	6	Yes	1.5	4
6	0.5	120	5	Yes	4	5
7	0.5	125	5	Yes	2	4

Table 2

Associated anomalies and sacral ratios in patients.

Patients	Associated anomalies	Sacral ratios
1	Duplex uterus	0.73
2	Unilateral kidney, scoliosis	0.51
3	Duplex uterus, ureteral reflux, sacral spinal dysraphism	0.46
4	Duplex uterus, double vagina	0.58
5	Double vagina, spina bifida occulta	0.34
6	Duplex uterus	0.74
7	None	0.77

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