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Experience with laparoscopic-assisted anorectal pull-through in 25 males with anorectal malformation and rectourethral or rectovesical fistulae: postoperative complications and functional results

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Abstract

Introduction: LAARP (laparoscopic-assisted anorectal pull-through) has become an established operation for anorectal malformation (ARM) with rectourethral or rectovesical fistula. The aim of this study was to review post-LAARP operation complications and midterm functional results.

Methods: Between 2003 and 2010, we performed 28 LAARPs in ARM patients with rectourethral or rectovesical fistula. We retrospectively analyzed the clinical outcomes in 25 male patients with rectourethral or vesical fistulae.

Result: The mean age of the patients at the time of LAARP was 2.7±1.4 months. The most common ARM type was rectoprostatic urethral fistula (n=16). Few immediate postoperative complications (urinary tract infection (1), ileus (1), and one case of pneumonia) occurred. Rectal mucosal prolapse developed and was excised 6 months later in 13 (52%) patients. Urethral diverticulum occurred in one patient with a rectobulbar urethral fistula. Immediate postoperative high rectal tone developed in six patients during the early study period (2003–2004). Six of the 12 patients older than 3 years had voluntary bowel movement and no soiling.

Conclusion: LAARP was a safe procedure. Shorter dissection of rectum in the intra-abdominal space may be helpful in preventing rectal mucosal prolapse. Intermittent rectal tube insertion may be useful for the patient with high rectal tone in the immediate postoperative period. LAARP is not recommended for the bulbar fistula with a long common wall.

LAARP has been increasingly applied for the treatment of ARM patients with rectourethral or rectovesical fistula since the first report by Willital [1] in 1998 and Georgeson et al. [2] introduced the new technique in 2000. Some centers have confirmed the efficacy and safety of LAARP in ARM patients in the past few years [3-5]. The benefits of this technique include a lack of necessity for complex sphincter division, better compliance of the external sphincter, excellent visualization of rectal fistulae and the surrounding

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structures, preservation of the distal rectum with accurate placement of the rectum within the levator ani and the external anal sphincter muscle complex, and improvement of rectal resting pressure and anorectal inhibitory reflex [2-8].

We adopted the LAARP technique in 2003. This report details the clinical outcomes of LAARP and our experience with 25 male patients who had ARM with rectourethral or rectovesical fistula.

1. Methods

1.1. Patients and methods

From December 2003 to 2010 April, 25 LAARPs were performed in male ARM patients with rectourethral or rectovesical fistula at Samsung Medical Center, Seoul, Korea. We retrospectively analyzed the clinical outcomes (patients' ages, types of fistula, associated anomalies, follow-up duration, hospital stay, feeding start day, operation time, postoperative complications, readmission and reoperation) from medical records.

1.2. Pre- and postoperative management

Most patients underwent a loop colostomy, and urethral fistulographies were performed to define the fistula and anatomy before surgery. Preoperative spine and abdominal sonograms and voiding cystourethrograms were routinely performed to determine associated anomalies. Preoperative bowel clearance was accomplished using warm saline, and prophylactic antibiotics were given.

Except for premature babies and patients with concurrent diseases or complications, all patients started taking sips of water postoperatively after recovery of bowel movements and then proceeded to normal feeding. Patients were discharged from the hospital after they were able to eat regularly and their wounds were clean, provided no complications were present.

1.3. Operation

LAARP was carried out according to Georgeson's description with minor modifications. Initially, we prepared four trocar sites, which were later reduced to three, and used the umbilicus as a camera port. The rectourethral fistula was ligated with loop ligatures and the pubococcygeus muscle was identified. After extracorporeal mapping of the anus with a transcutaneous electrostimulator, we placed the Veress needle at the proper position in the anus and dilated the perineal muscle with 5–12 mm trocars. Then, the rectum was pulled through via a 12-mm trocar and an anastomosis was made between the rectum and the anus. In the early period (2003–2004) of the study, we placed anchoring sutures between the rectum and the presacral fascia in an effort to prevent mucosal prolapse. However, we stopped doing this because it did not work. Twenty-three patients underwent a two-stage operation: an initial colostomy and LAARP with the colostomy taken down, while two patients underwent a three-stage operation: delayed colostomy take-down after LAARP.

Table 1 Patient characteristics.

Characteristic	Value (mean±SD)
Age at operation (months)	2.7±1.4
Body weight at operation (kg)	5.7±1.6
Postoperative hospital days	8 (median, range:6–42)
Operation time (h)	3.9±1.3
Diet start (POD)	4.7±3.4
Follow-up duration (months)	29.4±20.0

2. Results

The clinical characteristics of the 25 patients are summarized in Table 1. Associated anomalies and postoperative complications are summarized in Table 2. The mean age was 2.7±1.4 months and the mean duration of follow-up was 29.4±20.0 months. The most common type of anorectal malformation was rectoprostatic urethral fistula (n=16), followed by rectovesical fistula (n=6), and rectobulbar fistula (n=3). There were various associated anomalies, such as gastroschisis (n=1), duodenal atresia (n=1) and tracheoesophageal fistula (n=1). Spinal and spinal cord anomalies (n=10) and vesicoureteral reflux (n=10) were common (Table 2). Four of the ten vesicoureteral reflux patients underwent a urologic correction operation after LAARP. Two patients with spinal anomalies underwent neurosurgical procedures. (Table 2).

Table 2 Associated anomalies and postoperative complications (n=25).

	Rectobulbar (n=3)	Rectoprostatic (n=16)	Rectovesical (n=6)
Associated anomaly			
Vesicoureteral reflux	1	6	3
Spinal anomaly	2	6	2
Heart	0	1	2
Others	1	3	2
VACTERL	1	6	2
Complications			
High anal sphincter tone	0	3	3
Diverticula	1	0	0
Rectal mucosa prolapse	2	10	2
Anal stricture	0	0	1