

# Ureteroscopically Assisted Totally Laparoscopic Appendicocostomy

## A Minimally-Invasive Approach to an Intra-operative Complication

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### INTRODUCTION

Mitrofanoff appendicocostomy technique, as an efficient and durable continent catheterizable stoma to the urinary reservoir, has been traditionally done through an open Pfannenstiel or low midline abdominal incision.<sup>(1)</sup> However, in recent years, anecdotal cases of laparoscopic-assisted, robotic-assisted, and totally laparoscopic Mitrofanoff appendicovesicostomy have been reported.<sup>(2-5)</sup>

Here, we describe a patient treated using a totally laparoscopic appendicovesicostomy procedure with free-hand intracorporeal bowel repair.

### CASE REPORT

The patient was a 13-year-old boy suffered from insulin-dependent diabetes mellitus since infancy. He had a 1-year history of frequent episodes of urinary retention with overflow urinary incontinence. Urodynamic studies showed flaccid neurogenic bladder and post-void residual urine of more than 2 liters.

Because of difficulties with self-catheterization through the urethra, he was scheduled for laparoscopic appendicovesicostomy after providing informed consent for the possible need for open conversion.

### TECHNIQUE

In the right lateral position, through 4-port transperitoneal laparoscopy, after applying a laparoscopic Satinsky clamp at the base of the appendix with a 5-mm cecal cuff, the appendix with its cecal cuff was harvested while preserving the mesoappendix. The cecum was repaired with free-hand intracorporeal laparoscopic suturing and knot-tying techniques with 3-0 polyglycolic acid stitches in two layers (Figure 1-a).

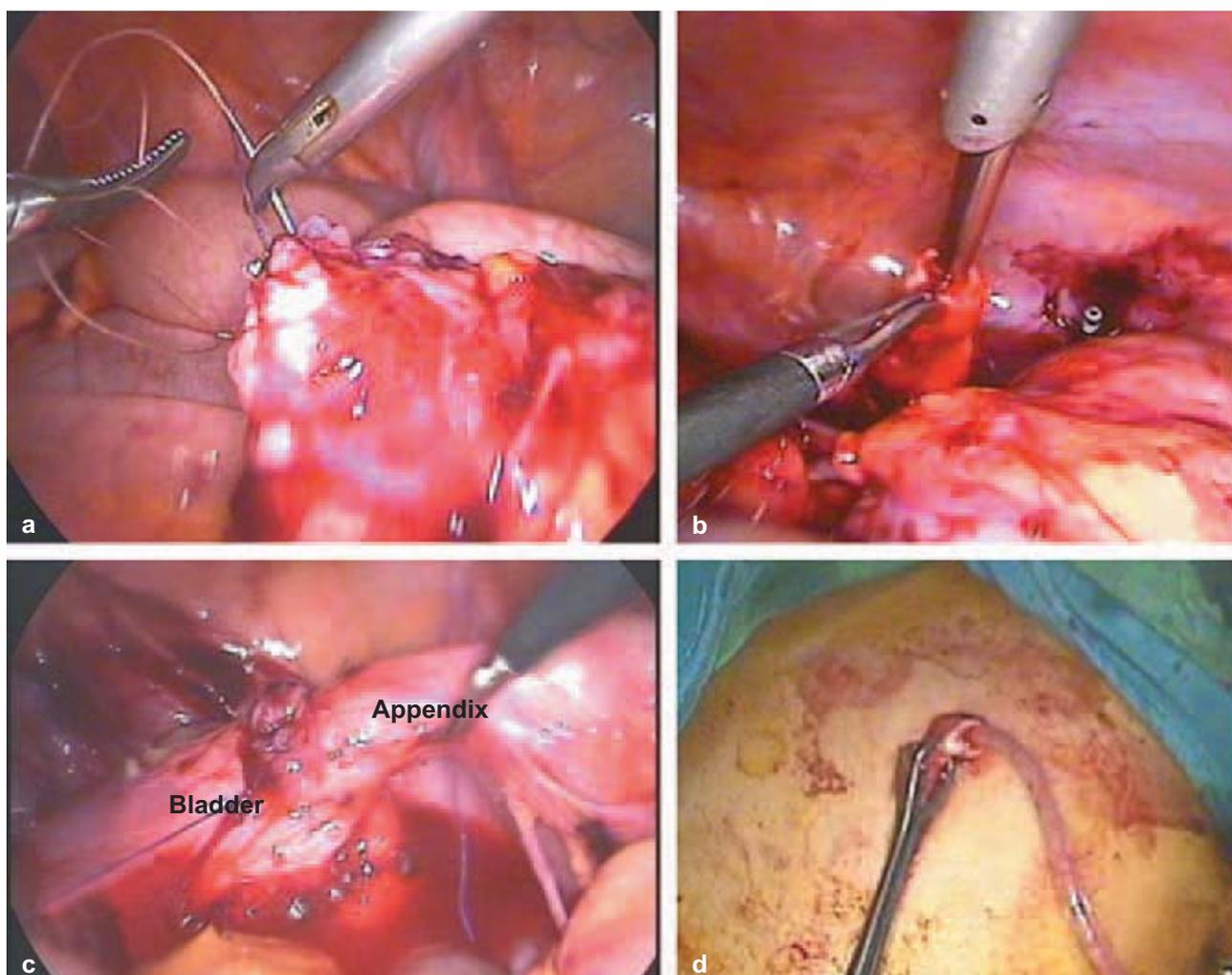
The tip of the appendix was excised and catheterized with an 8-F feeding tube to ensure patency, but the catheter could not be passed through the appendix. The appendix lumen was evaluated by passing an 8-F ureteroscope through a 5-mm laparoscopic port (Figure 1-b), which revealed a hard fecalith at the base of the appendix. The fecalith was fragmented with a pneumatic lithotripter under direct vision via ureteroscope, and ease of catheterization was then checked and confirmed.

After bladder mobilization, tunneled appendicovesical anastomosis was done over a 10-F catheter using 4-0 polyglycolic acid intracorporeal running stitches (Figure 1-c). The flush stoma was

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**Figure 1.** a) Cecal repair with free-hand intracorporeal laparoscopic suturing with Vicryl 3-0 stitches. b) Intraluminal visualization of the appendix with ureteroscope to relieve obstruction. c) Appendicovesical anastomosis with 4-0 polyglycolic acid intracorporeal running stitches. d) The flush stoma in the right upper quadrant at the site of the 5-mm trocar.

created in the right upper quadrant area at the site of the 5-mm trocar (Figure 1-d).

## RESULTS

The operation lasted 240 minutes. The bladder was drained with a Foley catheter for 4 weeks when the internal Foley as well as the appendiceal catheter were removed and the patient was able to catheterize his bladder via appendix stoma without difficulty every 4 hours (Figure 2). No urine incontinence or stomal stenosis has occurred within the 6-month follow-up period.

## DISCUSSION

In the past three decades, the Mitrofanoff procedure has been shown to be efficient for

reservoir drainage and to protect the upper urinary tract from the detrimental effects of a neurogenic bladder as well.<sup>(1)</sup> Performing this procedure in a minimally-invasive manner is the ultimate goal.

Jordan and the colleagues were the first to introduce laparoscopy for this technique. They mobilized the cecum and the appendix laparoscopically and completed the procedure through a Pfannenstiel incision.<sup>(2)</sup> Because of the complexity of intracorporeal suturing during this technique, robotic-assisted laparoscopic appendicovesicostomy has been tried in recent years with successful outcome.<sup>(3)</sup>

Casale and associates were the first to report the feasibility of intracorporeal totally laparoscopic



**Figure 2.** After laparoscopic appendicocecostomy, the patient could catheterize himself easily and he was continent.

appendicocecostomy in 2004. They transected the appendix with an endoscopic stapling device, and tunneled appendico-vesical anastomosis was done with intracorporeal suturing.<sup>(4)</sup>

Here, we presented our first experience with totally laparoscopic appendicocecostomy in a child with flaccid neurogenic bladder.

Unlike others, we did not use an endoscopic stapler to transect the appendix, and we opted for intracorporeal bowel repair. Appendiceal obstruction was successfully managed in a minimally-invasive manner.

Although laparoscopic appendicocecostomy is a demanding procedure that requires experience with intracorporeal suturing and tying techniques, its clinical outcome is highly rewarding due to its minimally-invasive nature.

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#### CONFLICT OF INTEREST

None declared.

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