



Evaluating surgical management and outcomes of colovaginal fistulas



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ABSTRACT

Background: Colovaginal fistula is a rare condition associated with significant morbidity. The literature characterizing colovaginal fistula repair is sparse. We present our institution's experience treating colovaginal fistulas.

Methods: A retrospective review of all patients surgically treated for colovaginal fistula between 2005 and 2015 was performed. Patient demographics, intra-operative details, and post-operative outcomes were reviewed.

Results: We identified 27 patients with a mean age of 71 (± 13) and BMI of 30 (± 9). The most common etiology for fistula was diverticulitis ($n = 24$, 89%). A laparoscopic approach was initiated in 19 patients (70%) and an open approach for 8 (30%) with 8 patients converted from laparoscopy to open (42%). At a mean follow-up of 18 months (± 21), there were no recurrences.

Conclusion: We present one of the largest series of the surgical management of colovaginal fistulas. Although our conversion rate was high, we recommend a laparoscopic approach be utilized when feasible.

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1. Introduction

Colovaginal fistulas are abnormal, epithelium-lined connections between the colon and vagina. The fistula commonly presents with the passage of stool or gas through the vagina. Symptoms vary from patient to patient but may include abdominal pain, fever, nausea, or vomiting. Fistulas are relatively uncommon, yet they can cause significant morbidity including associated intra-abdominal abscesses, sepsis, and even death.¹ Most colovaginal fistulas originate from diverticular disease, while colorectal and gynecological cancer account for the majority of other cases.^{1,2} Previous surgery such as hysterectomy is also common in patients with a colovaginal fistula.¹

The diagnosis of colovaginal fistula is largely based on clinical presentation and imaging. However, routine radiological and endoscopic investigations often fail to reveal small colovaginal fistulas, and patients may undergo multiple evaluations and office visits in an attempt to obtain a diagnosis. There is no gold standard in diagnostic tools for colovaginal fistula. Computed tomography and contrast enema have demonstrated greater sensitivity for diagnosing colovaginal fistula and identifying the underlying

etiology, while colonoscopy and flexible sigmoidoscopy have the advantage of allowing surgeons to take biopsies and exclude malignant lesions.^{3,4}

The surgical management of colovaginal fistula may involve either a multi-staged repair or a primary single-stage operation. As surgical technology has advanced, the array of possible management strategies for colovaginal fistula has expanded. The traditional method involved a three-stage operation, however, it is rarely performed currently. The two-stage Hartmann procedure has been adopted for more severe cases.³ More recently, surgical management has evolved to include the option of a single-stage operation with increasing evidence supporting its safety.^{3,5–7} Unfortunately, there remains a paucity of literature on this disease, with most reviews encompassing single centers with less than 15 patients. There are even fewer studies detailing the results of minimally invasive procedures in patients with colovaginal fistula.^{5,8,9} Therefore, the aim of this study was to evaluate the outcomes from different surgical strategies selected by surgeons at our institution to manage colovaginal fistulas.

2. Material and methods

After Institutional Review Board approval, a retrospective chart

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review was performed on all patients that underwent surgical repair of colovaginal fistula between 2006 and 2015 at University Hospital Case Medical Center. We used the *International Classification of Disease 9th Revision* codes 619.1, 596.1, and 596.81 to identify patients. Patients under 18 years of age and patients with incomplete medical records were excluded from the study.

Patient demographics, diagnostic details, and operative information were recorded. Demographics recorded included age, body mass index (BMI), history of previous chemotherapy, previous radiation to the pelvis, smoking, diabetes, steroid use, medical comorbidities, and prior abdominal/pelvic surgery. Diagnosis was based on either clinical assessment or radiological confirmation. Operative details included: indication, type of surgical resection, surgical approach, and whether or not an ostomy was created. The same enhanced recovery protocol was used for both groups, which in general includes post-operative intravenous patient-controlled analgesia with the addition of non-opioid analgesics, removal of the nasogastric tube at the end of the procedure, encouragement of early ambulation, early resumption of an oral diet, and early removal of the foley catheter. Complications were graded using the Clavien-Dindo classification system, with grades I and II shown as minor complications and grades III and IV shown as major complications. Patients were grouped by intention to treat; therefore, patients converted from laparoscopy to open were included in the laparoscopic group for statistical analysis.

Our primary outcome was recurrence of fistula, which was defined as recurrence of clinical symptoms or identification in radiological imaging or in a repeat operation. Recurrence was determined based on chart review of any outpatient or inpatient encounters, as well as imaging reports available in the medical record. Secondary outcomes included 30-day complications and mortality, ICU admission, as well as 30-day reoperation and readmission.

Statistical analyses were performed using SPSS 20.0 software. Laparoscopic and open resection groups were compared. Categorical and nominal variables were compared with chi-square or Fisher's exact test. Continuous variables are shown as the mean \pm standard deviation and were compared with Student's t-test. A p-value of less than 0.05 was considered to be statistically significant.

3. Results

A total of 27 patients with a mean follow-up of 18 months (± 21) were included in the study. There was no significant difference between laparoscopic and open approach patients in mean age, BMI, history of diabetes, steroid use or prior hysterectomy (Table 1). Overall, 23 patients (85%) were diagnosed with colovaginal fistula

alone, and 4 patients (15%) presented with other concurrent fistulas. Computed tomography was performed to confirm diagnosis in 22 patients (81%), and was the most commonly used imaging modality. Other diagnostic methods utilized included clinical examination, gastrograffin enema, flexible sigmoidoscopy, and vaginoscopy. The most common underlying etiology for fistula was diverticular disease ($n = 24$, 89%), with the remaining causes being pelvic inflammatory benign mass ($n = 1$, 4%), inflammatory bowel disease ($n = 1$, 4%), and rectal cancer ($n = 1$, 4%).

A laparoscopic approach was initiated in 19 patients (70%) and an open approach for 8 patients (30%). Due to the retrospective nature of this series, the decision for surgical approach was made at the surgeon's discretion. A one-stage operation was performed in 11 patients (9 laparoscopically and 2 open), two-stage operation with diverting loop ileostomy in 8 patients (7 laparoscopic and 1 open) and Hartmann's procedure in 8 patients (3 laparoscopic, 5 open). A suture repair of the vaginal defect was performed in 5 patients, suture repair with omental pedicle flap in 7 patients, and partial vaginectomy was performed in 1 patient. Among the laparoscopic resection group, there were 8 patients who were converted to an open procedure (42%). Reasons for conversion included significant adhesions ($n = 5$), a concomitant large phlegmon or pelvic mass ($n = 3$), and small bowel distention and edema ($n = 2$). Drains were left in place in 4 of the open procedures and 6 of the laparoscopic procedures. The mean operative time for patients in which a laparoscopic approach was utilized was 77 min shorter than for open procedures but was not statistically significant (200.5 ± 14.2 min vs. 277.9 ± 64.0 , $p = 0.17$). Operative times for the straight laparoscopic and laparoscopic converted to open procedures was nearly identical (200.5 ± 18.8 vs. 200.6 ± 24.0 , respectively, $p = 1.0$). Patients who underwent a laparoscopic converted to open procedure had a non-significant decrease in operative time compared to patients undergoing an open procedure (200.6 ± 24.0 vs. 277.9 ± 64.0 , $p = 0.35$). Operative time data was not available for 1 patient in the open group and 8 patients in the laparoscopic group.

Clinical outcomes were also compared between these two groups. Overall, the mean length of stay was 6 days (± 3), which was lower in the laparoscopic group (5.5 ± 3 days) than in the open group (7 ± 2.5 days), however this difference was not significant ($p = 0.2$). We performed a sub-analysis of the laparoscopic patients who underwent a straight laparoscopic procedure versus those converted to an open procedure which showed that those treated laparoscopically were discharged 3 days sooner than those that were converted (4.3 ± 2.2 vs. 7.3 ± 2.6 days) and 2.7 days sooner than those in the open group ($p = 0.02$).

Overall, 11 (41%) developed post-operative complications that necessitated intervention. Intra-operatively, one patient in the

Table 1
Patient demographics, fistula type and etiology.

	Overall (n = 27)	Lap (n = 19)	Open (n = 8)	P-value
Age, mean (SD)	71 (13)	70 (13)	74 (11)	0.4
BMI, mean (SD)	30 (9)	30 (10)	31 (6)	0.9
Diabetes, n (%)	13 (48)	8 (42)	5 (63)	0.3
Hysterectomy, n (%)	20 (74)	14 (74)	6 (75)	0.9
Steroid use, n (%)	5 (19)	3 (16)	2 (25)	0.6
Prior chemotherapy, n (%)	3 (11)	2 (11)	1 (12)	1.0
Prior pelvic radiation, n (%)	1 (4)	0	1 (12)	0.3
Fistula type (n, %)				
Colovaginal	23 (85)	16 (84)	7 (88)	0.8
Colovaginal + other	4 (15)	3 (16)	1 (12)	
Fistula etiology (n, %)				
Diverticular disease	24 (89)	17 (89)	7 (88)	0.9
Other	3 (11)	2 (11)	1 (12)	

BMI = Body Mass Index, SD = Standard Deviation.

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