LAPAROSCOPIC SIGMOIDECTOMY FOR FISTULIZED DIVERTICULITIS

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Abstract

Background: Nowadays colo-rectal laparoscopic surgery has shown its advantages in terms of reduced post-operative pain, earlier recovery of intestinal peristalsis and shorter hospital stay. Few studies reported results of laparoscopic surgery in complicated diverticulitis. The aim of this study was to analyze the results of laparoscopic sigmoidectomy in patients with fistulized sigmoiditis.

Methods: The authors retrospectively reviewed 16 patients operated on for fistulized sigmoidectomy between 1992 and 2003, in a series of 247 laparoscopic colectomies. Eleven patients presented with colo-vesical fistula, 4 with colo-vaginal and one with colo-cutaneous fistula, and all were caused by sigmoiditis. The procedure always consisted in coelioscopic sigmoidectomy with stapled transanal suture and eventually closure of the cystic or vaginal orifice.

Results: Mean age was 60 years (range: 39 to 78 years). Mean number of diverticulitis crises before operation was 3 (range: 1 to 5). Mean time between the last crisis and operation was 46 weeks (range: 2 to 250 weeks).Three cases (18.7%) were converted in the three first years of experience. Reason to conversion was necessary intestinal resection, splenectomy and wound of anterior rectum. The mean operating time was 172 min (range: 100 to 280 min). Mean hospitalization stay was 5.7 days (3-12 days). Mortality rate was 0%. Postoperative morbidity (12.5%) consisted in one pulmonary infection and one splenectomy. Long-term follow-up demonstrated no diverticultis recurrence and one incisional hernia.

Conclusion: In experimented hands, laparoscopic sigmoidectomy may be a safe and effective procedure for fistulized sigmoiditis.

Key words: Laparoscopy; surgery; colon; diverticulitis; fistula.

Introduction

Redwine and Sharpe described the first laparoscopic colon resection in 1991 [1] , and the first prospective trial on laparoscopic total abdominal colectomy was published in 1992 [2] . Since then, several studies have shown that laparoscopic sigmoid resection for benign indication is safe and produces short- and long-term outcomes similar to conventional surgery [3-6]. Compared to open colectomy, the advantages of laparoscopic colectomy may include less intraoperative trauma, reduction in post operative adhesions, decreased post-operative pain, decreased length of ileus, better cosmetic results, early hospital discharge and early return to work [7-16]. Some studies even argued that costs could be similar to open procedure if it is done by a trained surgeon [16].

Most of the studies on laparoscopic colectomies included several types of colonic diseases [3,7,13-15,17], and others analyzed the outcome of laparoscopic colon resection for uncomplicated sigmoiditis, excluding abscesses or fistulae [11,16,18,19]. Only few studies reported surgical procedures for some complicated diverticulitis but did not focus on it [20, 21, 22]. The aim of this study was to evaluate the feasibility of laparoscopic sigmoidectomy for fistulized diverticular sigmoiditis.

Patients and methods:

All laparoscopic colectomies performed in the author's institution are prospectively registered in a computed database. Among 247 laparoscopic colectomies performed between January 1992 to February 2003, 151 patients underwent laparoscopic sigmoidectomy for diverticulitis, and 16 (10.5%) of them suffered from fistulized diverticulitis. Eleven patients presented colovesical fistula, 4 had colovaginal fistula, and one had colocutaneous fistula, all due to diverticular sigmoiditis. The charts of these 16 patients were retrospectively reviewed, and collected data included age, gender, height, weight, ASA score, the number of previous sigmoiditis crises, chronic or acute status of the disease, conversion and reason for it, hospital

length of stay, complications, and reinterventions. Operation time was defined as the time interval between incision and closure of the skin. All laparoscopic sigmoidectomy procedures were performed with intracorporeal mobilization of the sigmoid colon and ligation of the mesenteric vessels with clips followed by division of the sigmoid colon at the recto-sigmoid junction. This zone was then stapled by one or two endo-GIA 45. When the fistula tract was identified, it was closed with absorbable stitches. In the cases of colovesical fistulae, methylen blue dye was injected in the bladder catheter to assess closure. The colon was exteriorized through a minimal extension of one of the port site .The proximal division of the colon was done extra corporeally. The anvil of a PCEEA (autosuture®) stapler was sewed into the lumen of the exteriorized descending colon and replaced into the abdomen. Pneumoperitoneum was reestablished and a termino-terminal trans-anal circular stapling reestablished intestinal continuity. An air test was finally done to control the anastomosis. Every patient was seen at the out-patient clinic one month after withdrawal, and last follow up was performed by telephone contact.

Results:

There were 10 men and 6 women. The mean age was 60 years old (range: 39 to 78). The ASA score was I for 8 patients, II for 7 patients and III for one patient. The mean number of diverticulitis crises before operation was 3 (range: 1 to 5). The mean interval between the last crisis and operation was 46 weeks (range: 2 to 250). Four patients suffered from colovaginal fistula: the diagnosis was based on proved stools in vagina at clinical exam. Three colovaginal fistulae were demonstrated preoperatively by barium enema, and in one case the enema was falsely negative. For the 11 colovesical fistulae, diagnosis was based on recurrent cystic infection and pneumaturia. Enema showed the colovesical fistula in 5 patients, and was negative in 5 other cases. In these five cases, cystoscopy demonstrated the fistula. The eleventh patient underwent only an abdominal computed tomography showing air in the

bladder without any previous manipulation of the urinary tract. For the enterocutaneous fistula, diagnosis was clinical and secondary confirmed by barium enema.

During laparoscopic procedure 3 colovaginal fistulae were peroperatively identified and one was closed by adsorbable stitches. Ten colovesical fistulae were identified and 7 were closed by stitches. The laparotomy conversion rate was 18.75 % (3 cases). The first one was converted in 1992 for an intestinal resection, the second in 1994 for a wound of the anterior rectum and the last in 1995 for a traumatic iatrogenic spleen bleeding necessitating emergency splenectomy. In the last ten cases operated on after 1995 none were converted. Mean operative time was 172 minutes (range: 100 to 280) including the converted procedure. Mean hospitalization stay was 5.7 days (range: 3 to 12) including the whole series and 4.6 days excluding the 3 converted cases. The mortality rate was 0%. The morbidity consisted on one pulmonary infection and one splenectomy for peroperatory hemorrhage. No septic locoregional complication or anastomotic leakage is described. One patient was lost for follow-up. Excluding this patient, follow-up mean time was 64 months (range: 7 to 141). No disease recurrence was reported. Only one patient was not satisfied by the intervention because of remnant abnormal vaginal secretions. Gynecological examinations determined the uterine origin of the problem and excluded recurrence of fistula. One patient was reoperated for incisional hernia.

Discussion:

The natural history of diverticular disease of the colon is well known. Diverticular disease is present in more than one-third of the western population over 45 years old and the incidence increase to two-thirds over the age of 85 years. Most of the patients remain asymptomatic but 20 to 25% will develop diverticulitis after 10 years of evolution and 35% after 20 years [23-24]. Many surgeons agree with conservative treatment for patient aged over 50, or for non-complicated crisis. Surgical indications remain: 1) complications as abscess, perforation,

fistula, stenosis, 2) recurrence of the disease, 3) resistance to medical treatment. One could summarize by saying that sigmoidectomy is indicated if a life threatening complication is found [25-26]. Elective surgery has become the best option when possible. Colonic preparation allows sigmoid resection without stoma even in acute episode of sigmoiditis after a few days of broad spectrum antibiotics infusion. There is a consensus concerning the level of resection. It is recommended to remove only the diseased segment of the colon but not all the diverticules. The distal resection line should be just below the rectosigmoid junction avoiding recurrence [27].

After experience with various laparoscopic procedures, laparoscopic colonic resection have been developped since 1991.Table I review most significant publications since 1997. In the literature, many reports described laparoscopic colectomy series of patients with miscellaneous pathologies including diverticulitis but generally excluding complicated cases as abscess or fistulae. We can see two recent studies comparing laparoscopic and open procedure for colonic resection in diverticulitis [28-16] (Table I). They conclude to the superiority of laparoscopic technique but Dwivedi clearly excluded complicated sigmoiditis of it's study and Senagore do not precise if complicted divericulitis were included. The largest series concerning only laparoscopic procedure for diverticulitis were reported by Kockerling, Lemoine or Bouillot [20, 29, 30]. The first study demonstrated differences between complicated and non complicated diverticulitis, with longer operating time, higher conversion rate and morbidity. The last two studies demonstrated the feasibility and the low risk of the laparoscopic sigmoidectomy without describing the evolution of the fistulized cases (4 patients in Lemoine's series, and one colovesical fistula plus one ileocolic fistula in Bouillot's series). In another paper, Liberman compared 14 patients undergoing laparoscopic versus &' open procedure [31]. The laparoscopic sigmoidectomy was done for 3 colovesical and 1 colovaginal fistula. Neither the operative time nor hospital stay was lengthened. No

complication was described and the authors concluded that colovesical or colovaginal fistula could be treated by laparoscopy safely by experienced laparoscopic surgeons. The Joo experience was a mix of fistulized cases secondary to sigmoiditis in four cases, post surgical procedure in two cases and secondary to Crohn's disease in four cases [21]. In this series despite the heterogeneity, morbidity was low and operating time reasonable.

At first, fistula might seem to be a contraindication to perform laparoscopic colectomy. However one can conclude from the literature that patients with fistulized diverticulitis may benefit from laparoscopic procedure even if this operation is more complex in these complicated cases. Particularly, there are no precise data on specific morbidity and mortality of laparoscopic colectomy in fistulized diverticulitis. To the author's knowledge, no publication reported only complicated diverticulitis and its laparoscopic management. In our series, all patients underwent laparoscopic sigmoidectomy without loop colostomy or Hartmann's procedure, and without increased morbidity and mortality. Our results are comparable to the procedure performed for non-complicated cases. The same remark could be done for the conversion rate, the operating time and the hospital stay.

In conclusion, colovesical, colovaginal or colocutaneous fistulae should not be absolute contraindications to perform laparoscopic colectomy. The procedure in these patients requires more skills that for non complicated cases. Dissection, closure of the fistula and inflammatory adhesions could stop the surgeon but the results in term of benefits for the patients may be the same than for the non-complicated diverticulitis without majoring the risks.

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Table 1

AUTHOR	JOURNAL	N	MORBIDITY	MORTALITY	CONVERSION	OP TIME	HOSP STAY
JOO JS [21]	SURG ENDOSC	10fistulized	10%	0%	30%	195 MIN	6 DAYS
	1997	(4 sigmoiditis)					
LIBERMAN M.A [31]	SURG ENDOSC 1999	14	14 %	0 %	0 %	192 MIN	6.29 DAYS
KOCKERLING F.[20]	SURG ENDOSC 1999	304	14.8 % NC	1.1 %	7.2 %	164 MIN	
		81,9% NC vs18,1 C	*28.9 %* C		4.2 % NC	159 NC	
					18.2 % C	182 C	
SCHLACHTA. CM [32]	SURG ENDOSC 1999	92	18.4 %	0 %	6.5 %	153 MIN	5 DAYS
SIRISIER.F [22]	SURG ENDOSC 1999	65	17 %	0 %	4.6 %	197 MIN	7.6 DAYS
		Including C					
SMADJA.C [18]	SURG ENDOSC 1999	54	12.9 %	0 %	9.2 %		6.4 DAYS
BERTHOU.JC [19]	SURG ENDOSC 1999	110	7.3 %	0%	8.2 %	167 MIN	8.2 DAYS
TUECH .JJ [33]	SURG ENDOSC 2001	77	16.8 %	0 %	14 %	207 MIN	8.5 DAYS
		(21 obese)					
LAUTER DM [17]	AM J SURG 2001	150	16 %	1.33 %	12 %	177 MIN	4.2 DAYS
		(22 sigmoïditis)					
DWIVEDI M [28]	DIS COL RECT 2002	66	10.6 %	0 %	*19.7 %*	143 MIN	4.8 DAYS
SENAGORE [34]	DIS COL RECT 2002	61	*8.2 %*	1.6 %	6.6 %	109 MIN	3.1 DAYS
LEMOINE.MC [31]	SURG ENDOSC 2002	156	21.8 %	0 %	14.1 %	277 MIN	8.2 DAYS
BOUILLOT JL [29]	SURG ENDOSC 2002	179	14.9 %	0 %	13.9 %	223 MIN	9.3 DAYS
		(multicentric)					
SENAGORE AJ [16]	DIS COL RECT	181	6,6%	0,6%	12,1%	119 MIN	2,9 DAYS
	2003	(115 sigmoiditis)					

C: complicated diverticulitis (abcess,fistula).

NC: non complicated diverticulitis.

Legends for illustrations:

Fig 2: Barium enema showing colo vesical fistula (arrow). B: bladder; S: sigmoid colon.

Fig 1: Barium enema showing colo vaginal fistula (arrow). R: rectum; S: sigmoid colon; V: Vagina.

Table 1: Literature on laparoscopy in diverticulitis.