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## Long-term assessment of fecal incontinence after lateral internal sphincterotomy

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**Abstract Background** Lateral internal sphincterotomy (LIS) can cause fecal incontinence. The aim of this study was to evaluate this sequelae after long-term follow-up of patients treated by LIS and to identify possible associated factors. **Methods** Data were retrospectively collected for patients with chronic anal fissure who had LIS between 1994 and 1997. Continence was assessed according to the incontinence score (IS) obtained by medical record review and telephone questionnaire. Statistical analysis was performed using Student's *t* test for quantitative variables and chi-square test for qualitative variables. **Results** All 68 patients evaluated had healed after fissure surgery. None of these patients had preoperative fecal incontinence neither recurrence at the time of follow-up. At a mean follow-up of 66.6 months (range, 30–84 months), 7 patients (10.2%) were incontinent (mean IS=8.2; range, 5–16) and none had recovered continence at the time of follow-up. There was no significant difference between patients with and without fecal incontinence relative to gender age, hemorrhoidectomy combined with LIS, or vaginal delivery. **Conclusions** Incontinence due to LIS does not recover after long-term follow-up and appears to be an independent cause of fecal incontinence.

**Key words** Fecal incontinence • Lateral internal sphincterotomy • Chronic anal fissure

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### Introduction

Anal fissure is one of the most frequent complaints in proctology. Spasm of the internal sphincter may play a key role in the pathogenesis of anal fissure [1–3]. Lateral internal sphincterotomy (LIS) reduces the internal anal sphincter pressure facilitating the healing of chronic anal fissure in 95% of cases [4, 5]. Several complications have been described after LIS, but fecal incontinence is certainly the most undesirable consequence [6, 7]. However this complication, in most cases, tends to disappear over a short period of time.

Although, many studies have evaluated incontinence in the immediate postoperative period [6, 8, 9], only one report [10] has determined the incidence of fecal incontinence in the long-term outcome. The purpose of this study, therefore, was to perform a long-term assessment of fecal incontinence after LIS.

### Patients and methods

Retrospective data were collected of patients with chronic anal fissure who had LIS between 1994 and 1997. All patients who underwent LIS for chronic anal fissure with at least two years of follow-up were included in the study.

The diagnosis of chronic anal fissure was based on the following clinical criteria: evidence of posterior circumscribed ulcer, with a large sentinel tag of skin, induration at the edges, and exposure of the horizontal fibers of the internal anal sphincter; and symptoms (post-defecatory or nocturnal pain, bleeding, or both) lasting for more than two months.

The technique adopted was described by Parks [8]. Under general anesthesia with the patient in gynecological position, a Pratt bivalve was inserted into the anal orifice, and a short incision was made just distal to the intersphincteric groove. The full thickness of the internal sphincter was divided from its lower edge to the level of the dentate line. When hemostasis was obtained, the wound was left open. Patients were discharged on the same day of operation on a regular diet. All surgeries were

done by either the three colorectal staff surgeons or by residents assisted by the same staff.

Continence was assessed by a standard scoring system [11] obtained by medical record review and telephone questionnaire; the incontinence score (IS) ranges from 0 (no incontinence) to 20 (complete incontinence). Statistical analysis was carried out using Student's *t* test and chi-square test.

## Results

Between 1994 and 1997, a total of 68 patients (27 men) underwent lateral internal sphincterotomy (LIS) for chronic anal fissure. The patients' average age was 49.8 years (range, 21–75 years). The mean follow-up period was 66.6 months (range, 30–84 months).

The fissure healed after surgery in 66 cases (97%); the median time for this to occur was 25 days. One patient (1.5%) was reoperated due to a wound infection. The fissure persisted in two patients but healed when topical medication was added. None of the patients had recurrence at the time of follow-up. No patients had preoperative fecal incontinence, whereas at follow-up 7 patients (10.3%) were incontinent with a mean incontinence score (IS) of 8.2 (range, 5–16). Incontinence symptoms were manifested just after surgery in all 7 cases. None of the patients have recovered continence or improved since the time of surgery.

As shown in Table 1, there was no significant difference between patients with or without fecal incontinence relative to gender and age. Moreover, no differences were identified between these two groups in terms of numbers of patients who had LIS and hemorrhoidectomy simultaneously, or regarding number of female patients who had had vaginal deliveries.

## Discussion

Chronic anal fissure is associated with an internal sphincter spasm [12]; fibrosis is often observed in these patients [13].

Patients with internal sphincter spasm have increased basal pressure at anal manometry. Farouk et al. [12] and

Notaras [9] described a LIS technique that has replaced anal dilatation and posterior sphincterotomy. In most series, LIS permitted healing of fissure in more than 95% of cases. LIS is a simple procedure with low morbidity [10, 14]. Recurrence or persistence of the fissure after surgery has been reported in less than 10% of cases [6, 10, 12].

The incidence of fecal incontinence caused by the sphincterotomy has not been well recorded. The incidence described in the literature ranges between 1.3% and 66% [5, 6, 15, 16]. This difference is probably due to the difficulty in identifying this problem and to the lack of a standardized scoring system.

Fecal incontinence is usually a transitory complaint after LIS. Although many studies reported the incidence of fecal incontinence immediately after surgery, only Nyam and Pemberton [16] reported the incidence in a long-term follow-up; they observed an incidence of incontinence of 45% in the short-term outcome, which decreased to less than 11% in the long-term follow-up. In contrast with the results reported by Nyam and Pemberton [16], in the current study the overall incidence of incontinence due to LIS was low (10.3%) right after surgery but did not change in the long term. Only one patient suffered severe fecal incontinence. Although idiopathic fecal incontinence is a common complaint in the aged population, mostly combined with pudendal neuropathy, there was no correlation between age and symptoms of incontinence in this study.

Sultan et al. [17] observed in a prospective study that women had a higher incidence of fecal incontinence after LIS because, in contrast to men, this surgery appears to result in more extensive disruption than intended. This is most likely related to the shorter anal canal in women [18]. Moreover, patients with previous obstetric trauma may be at increased risk of incontinence following such a procedure because of the higher incidence of external sphincter disruption [19]. Clinically silent external sphincter defects identified before the LIS have been implicated in the genesis of incontinence after this procedure [17, 20]. In contrast with these previous reports, we did not identify a correlation between gender or patients with obstetric history as a possible cause of fecal incontinence.

In agreement with Leong et al. [21], there was no statistically significant difference in incontinence between

**Table 1** Conditions potentially predisposing to fecal incontinence after lateral internal sphincterotomy in 68 patients with chronic anal fissure

	Incontinent patients (n=7)	Continent patients (n=61)	<i>p</i>
Age, years <sup>a</sup>	53.57 (38-66)	46.13 (21-75)	0.58
Male, n (%) <sup>b</sup>	3 (4.4)	24 (35.3)	0.82
Hemorrhoidectomy, n (%) <sup>b</sup>	2 (2.9)	16 (23.5)	0.75
Vaginal delivery n (%) <sup>c</sup>	3 (75.0)	10 (27.0)	0.16

<sup>a</sup> Values are mean (range); <sup>b</sup> Percent of 68 patients; <sup>c</sup> Percent of all women in the group

patients who had LIS alone and those with an associated hemorrhoidectomy.

Some authors have attempted to use manometry to identify patients with a higher risk of incontinence after LIS [22, 23]. However, the hypertonia of the internal sphincter caused by the fissure prevents an accurate assessment [24]. Prohm and Bonner [25] showed that both resting and squeeze pressures were increased in patients with anal fissure but there was no relation between manometric values before LIS and its sequelae of continence.

Many studies have described the use of drugs such as nitroglycerin [26, 27] and botulin toxin (BT) [28, 29] which, by creating a transitory relaxation of the internal sphincter, facilitate the healing process without leaving irreversible incontinence sequelae. In a randomized prospective study [30], BT was more effective than nitroglycerin in healing chronic anal fissure (96% vs. 60%;  $p=0.005$ ). Some cases of fecal incontinence after the use of BT were recorded, but these patients recovered with the relaxing effect of the drug three months after its application [31]. Richard et al. [32] compared LIS and nitroglycerin and reported that surgery was more effective in the healing of anal fissure with less adverse effects. There is only one published study comparing BT and LIS [33]. The healing rate of chronic anal fissure was considerably high with the use of BT injection with earlier recovery and fewer complications. However, with BT a repeat injection is sometimes required, and the healing is slower. Finally, in the early (two months) and late (one year) follow-ups, the healing rates were significantly higher in the LIS group. In a recent systematic review, Nelson [34] concluded that there are no drugs available today better than surgery for the treatment of chronic anal fissure. However, since different anal pressure profiles have been described in patients with chronic fissures, a tailored management may be considered [35].

LIS is an excellent method to treat chronic anal fissure and it has a low recurrence rate. Although the incidence of incontinence due to LIS is low, it can become a permanent sequela; severe fecal incontinence after LIS is rare. Further prospective studies are required to evaluate if there are any associated conditions that predispose to fecal incontinence after LIS or if the surgery alone is an independent cause of fecal incontinence.

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