

Anal sphincter function after treatment of fissure-in-ano by lateral subcutaneous sphincterotomy versus anal dilatation

A randomized study

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Abstract. Twenty patients with chronic anal fissure were randomized into two groups. Ten patients were treated with lateral subcutaneous sphincterotomy and 10 with anal dilatation. Anal dilatation was carried out preoperatively, and at 1 and 3 months after the operation in all patients. Preoperatively there was a significantly increased maximal resting pressure in the 20 fissure patients (80 mmHg median) compared with 20 control subjects (50 mmHg median). Postoperatively a significant decrease in pressure occurred in the dilated group (49 mmHg median $p < 0.05$), whereas the pressure was not significantly reduced in the group that underwent sphincterotomy (65 mmHg median $p < 0.05$). At 1 year three patients complained of recurrent symptoms of anal fissure in the dilated group compared with one in the sphincterotomy group. Minor continence disturbance was noted in two patients in both groups.

Lateral subcutaneous sphincterotomy (LSS), originally described by Notaras [1], is now an accepted method in the surgical treatment of chronic anal fissure.

In a few reports LSS has been followed by a higher cure rate than anal dilatation (AD) in the treatment of anal fissure and minor defects in continence was more frequent after anal dilatation [2, 3]. Since an increased anal resting pressure has been found in patients with chronic anal fissure, decrease of anal tone has been considered one of the aims of the treatment of this condition [4].

A decrease in basal pressure has previously been reported both after AD and after LSS [5, 6], but no comparative studies have been performed.

In the present randomized study anal manometry, recurrence rate and continence disturbances were recorded after LSS and AD in patients with chronic anal fissure.

Patients and methods

Twenty patients, 12 females and 8 males, with chronic anal fissure were studied. None had previously undergone surgery for anal fissure. One patient was incontinent for gas and one patient complained of soiling. Prior to surgery all patients had an anorectal examination including ano-proctoscopy and anal manometry. The anal fissure was located posteriorly in all patients. Patients with additional anal disease were excluded.

The patients were randomly allocated to either LSS (10 patients median age 38 years (33–55)) or AD (10 patients median age 46 years (31–52)). At 1 and 3 months after the operation anal manometry was repeated and at 1 year all patients answered a questionnaire concerning continence and recurrent symptoms of fissure-in-ano.

Both LSS and AD were performed under general anaesthesia with the patients in the lithotomy position. LSS was performed on the left side through a small skin incision lateral to the lower edge of the internal sphincter. The intersphincteric groove was identified and the intersphincteric plane opened with a scissor. With a knife introduced into the intersphincteric plane the internal sphincter was divided to the level of the dentate line. Anal sphincter dilatation was performed to four fingers [4].

Anal manometry

The examination was performed with the patient in the left lateral position; no bowel preparation was used. Pressure in the anal canal was measured with an optipuff perfused system consisting of a rigid low compliance polyvinyl catheter with an outer diameter of 2 mm and an inner diameter of 1 mm. The catheter ended in a steel cap with the same external and internal diameter and three sideholes lying at 120° to each other. The catheter was perfused with a flowrate of 0.7 ml/min through a water-filled strain gauge connected to an ink recorder via a transducer. The manometric system had a pressure rise rate (dp/dt) of 800 mmHg/s. The anal pressure profile was recorded by placing the catheter in the rectum and withdrawal by constant speed (5 mm/s) by a machine. Three profiles were recorded with the patient relaxed and another three profiles were recorded during maximum voluntary contraction of the anal sphincter. Maximum resting pressure was defined as the highest pressure obtained with the patients relaxed, and maximum squeeze pressure as the highest pressure obtained during voluntary contraction of the anal sphincter. The length of the pressure zone was calculated as the distance from the start of the pressure increase until pressure fell below the baseline level when the probe was withdrawn from the anus.

Length of pressure zone, maximum resting- and squeeze pressure were calculated as the mean of the three measurements

Table 1. Anal manometry before and after anal dilatation (AD) or lateral subcutaneous sphincterotomy (LSS) for chronic anal fissure

	Control	Preoperative		1 month postoperative		4 months postoperative	
		AD	LSS	AD	LSS	AD	LSS
Number	20	10	10	10	10	8	8
Length of pressure zone (mm)	28 (24–31)	36 (28–39)	29 (26–37)	32 (23–39)	31 (25–36)	33 (26–38)	31 (27–35)
Resting pressure (mm Hg)	50 (40–60)	80 ^a (72–91)	84 ^a (80–88)	49 ^b (43–57)	65 (44–85)	55 ^b (42–70)	68 (65–77)
Squeeze pressure (mm Hg)	140 (98–110)	127 (115–176)	169 (127–215)	159 (100–175)	129 (101–173)	135 (125–171)	149 (130–191)

^a Significantly raised pressure compared with normal ($p < 0.05$); ^b Pressure significantly reduced compared with preoperative values ($p < 0.05$). Median values and interquartile range are shown

Table 2. Anal manometry in patients with postoperative continence disturbance

	Case no.		Resting pressure (mm Hg)				Squeeze pressure (mm Hg)			
	LSS	AD	Preoperative		Postoperative		Preoperative		Postoperative	
			LSS	AD	LSS	AD	LSS	AD	LSS	AD
Recurrence of anal fissure	1	1	88	90	71	83	271	160	108	172
		2		76		19		176		113
Minor incontinence	2	3	83	72	64	45	173	228	185	130
		3	4	118	84	96	43	237	123	195

and compared with values in 20 control subjects of the same age and sex without ano-rectal diseases.

Differences were analyzed by Wilcoxon's test for paired data and by Mann-Whitney's test for unpaired data. P-values less than 0.05 were considered significant.

Results

The results of anal manometry are shown in Table 1. Preoperatively maximum resting pressure was significantly increased in both groups compared with the control subjects ($p < 0.05$). Postoperatively maximum resting pressure decreased significantly in the AD group ($p < 0.05$) whereas it remained unchanged in the LSS group. The postoperative maximal resting pressure in the AD group was not significantly different from the control group, whereas it remained significantly increased in the group that underwent LSS.

Preoperatively no significant difference was found in maximal squeeze pressure in either group compared with the control group and in neither group was any significant decrease in squeeze pressure found. After 1 year, 3 out of 10 patients treated by AD had recurrent fissure compared to 1 out of 10 treated by LSS. In both groups two patients, who were completely continent preoperatively, became incontinent for gas and complained of soiling 1 year

after the operation. Anal manometry recorded in these patients is shown in Table 2.

Discussion

Lateral subcutaneous sphincterotomy has in previous studies on treatment of chronic anal fissure shown a higher success rate and a lower incidence of continence disturbances than anal dilatation [2, 3].

In some studies a high maximal resting pressure has been measured in patients with chronic anal fissure and successful treatment has been associated with reduced anal pressure after both LSS and AD [4, 5]. In our study maximum resting pressure was increased preoperatively compared with the control group but was only reduced postoperatively in patients after anal dilatation. The high success rate, although not significantly, was found after LSS, even though resting pressure was not reduced postoperatively in this group. Since the resting pressure was significantly increased in both groups preoperatively, the therapeutic effects of LSS may rather be by an anatomical widening of the anal canal than a lowering of the anal pressure [7], suggesting that factors other than increased resting tone are involved in the pathogenesis of chronic anal fissure. This hypothesis is also supported in a study by Hiltunen et al. [6] in

which a number of patients treated by AD or LSS had no change in resting pressure although the anal fissure healed successfully after either treatment.

Two patients in each group who were continent preoperatively had minor impairment of continence after one year which, however was not reflected in the anal manometry. Likewise we found in a previous study that patients with minor continence disturbances after haemorrhoidectomy combined with anal dilatation, all had normal anal manometry [8].

Although the frequency of side-effects was equal in the two groups only one patient had recurrent symptoms of anal fissure in the group that underwent LSS compared with three after anal dilatation, indicating that LSS is as good as or may be superior to AD in the treatment of chronic anal fissure in spite of its lack of effect on resting anal pressure.

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