

**IMPACT OF TWO DIFFERENT TYPES OF ANAL  
RETRACTOR ON FECAL CONTINENCE AFTER  
FISTULA REPAIR: A PROSPECTIVE, RANDOMIZED  
CLINICAL TRIAL**

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## **ABSTRACT**

30 Consecutive patients were randomized into two groups. In group A (n=15) a Parks' retractor was used during fistula repair, in group B (n=15) the repair was performed with a Scott retractor. Before and three months after surgery, maximum anal resting pressure (MARP) and maximum anal squeeze pressure (MASP) were recorded. In addition continence status was evaluated using both the Rockwood Fecal Incontinence Severity Index (RFISI) and the scoring system according to Parks. In group A median MARP dropped 76 to 42 mmHg. In group B no significant difference was observed between the preoperative and postoperative MARP. The difference in the changes from baseline between the two groups was statistically significant ( $p=0.04$ ). No significant changes in MASP were observed. In group A the median RFISI increased from 0 to 12. In group B the median RFISI did not change after the operation. The difference between the two groups was statistically significant ( $p=0.038$ ). The use of a Parks' retractor during perianal fistula repair has a deteriorating effect on fecal continence, probably due to damage of the internal anal sphincter. Since this side effect was not observed after the use of a Scott retractor, we advocate the use of this retractor during all fistula repairs.

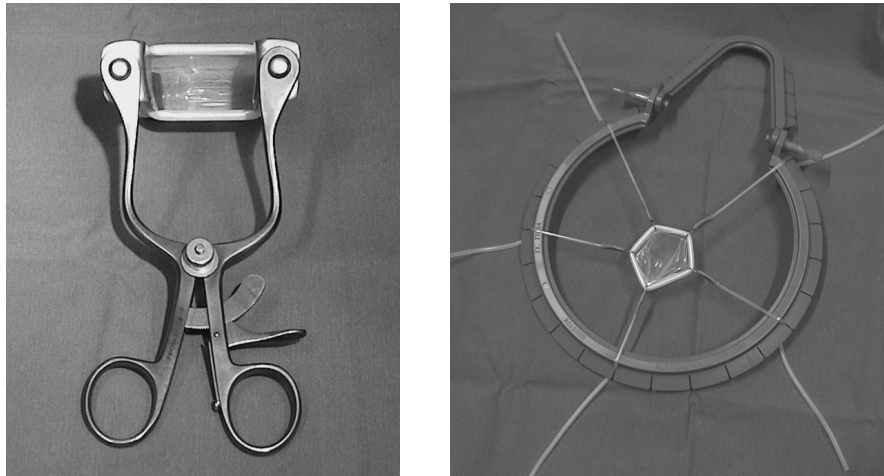
## **INTRODUCTION**

Intersphincteric and low transsphincteric fistulas can almost always be cured by simple fistulotomy. Although incontinence for solid stool is rare after this procedure, the reported incidence of minor continence disturbances such as soiling, incontinence for gas or liquid stool is high, varying between 30 and 50 percent<sup>1,2</sup>. The incidence of incontinence for solid stool is much higher when a fistulotomy is performed in patients with a high transsphincteric fistula (passing through the upper

or middle one third of the external anal sphincter). Several 'sphincter saving techniques' have been introduced to prevent impairment of continence after repair of such a high transsphincteric fistula. The transanal advancement flap repair (TAFR) is most often utilised. Several authors did not observe continence disturbances at all after this technique<sup>3-5</sup>. According to other studies however, the incidence of disturbed continence varies between 8 to 15 percent <sup>6-8</sup>. In a previous study, performed at our institution, an even higher incidence of disturbed continence was observed<sup>9</sup>. The exact cause of this high incidence is not clear, since TAFR is designed to minimize damage to the anal sphincters. Recently it has been suggested, that anal stretch, due to the use of a Parks' retractor, is a major contributing factor in the impairment of fecal continence<sup>10</sup>. Aim of the present study was to compare two different types of anal retractor (Parks versus Scott) with regards to their impact on fecal continence after fistula repair.

## **PATIENTS AND METHODS**

Between November 2000 and November 2001, 30 consecutive patients with a perianal fistula entered the study. Preoperatively, all patients were randomized into two groups. In group A (n=15) a Parks' retractor (figure 6.1) was used during fistula repair, whereas in group B (n=15) the repair was performed with a Scott retractor (Lonestar Retractor System, Lone Star Medical Products ®, Houston, Texas) (figure 6.1). Patient characteristics are depicted in table 6.1. Twenty-three patients had a high transsphincteric fistula, passing through the upper two thirds of the external anal sphincter. These patients underwent a transanal advancement flap repair as described in chapter 3<sup>9</sup>.



**Figure 6.1;** The different anal retractors used in fistula repair; the **Parks'** retractor (left) and the **Scott** retractor (right)

Seven patients (group A; n=4, group B; n=3) had either a low transsphincteric fistula, passing to the lower third of the external anal sphincter or an intersphincteric fistula. These seven patients underwent a coring-out procedure with instillation of fibrin glue (Tissucol ®) as described by Cintron et al<sup>12</sup>.

	<b>Group A</b> (Parks' Retractor)	<b>Group B</b> (Scott Retractor)
No. Pts	15	15
M:F Ratio	12:3	9:6
Median Age	46 (35-54)	45 (25-72)

**Table 6.1;** Characteristics of Different Groups before fistula repair

### **anal manometry**

Anal manometry was performed prior to the procedure and 12 weeks after the repair. The preoperative and postoperative manometric data were studied and compared between groups. Anal pressures were measured using a microtip pressure

transducer (Millar Instruments, Inc., Houston, Texas, U.S.A.) with an outside diameter of 1.7 millimeters. In each subject, the catheter was introduced into the rectum until rectal pressure was recorded, after which the probe was removed manually. This maneuver was repeated three times. The mean value of the maximum anal resting pressure (MARP) was determined for each subject. After this, a maximum voluntary contraction was performed and the resultant pressure relative to the baseline pressure was recorded in order to determine the maximal anal squeeze pressure (MASP).

#### **fecal continence**

Continence status was evaluated using both the classification system according to Parks and the Rockwood Fecal Incontinence Severity Index<sup>10</sup> (RFISI). This scoring system is based on a type x frequency matrix, which was developed using both surgeons and patients input for the specifications of the weighting scores. For the present study, patients inputs were utilized. Continence was evaluated before and twelve weeks after the procedure. The preoperative and postoperative RFISI data were studied and compared between groups.

#### **statistical analysis**

Changes within groups were evaluated using Wilcoxon's signed rank test. Comparison of these changes between groups was conducted using the Mann-Whitney test. A p-value  $\leq 0.05$  was considered to be statistically significant.

## **RESULTS**

The values of Maximum Anal Resting Pressure (MARP), Maximal Anal Squeeze Pressure (MASP) and the Rockwood Fecal Incontinence Severity Indices (RFISI),

measured before and twelve weeks after the operation, are depicted in table 6.2.

	<i>MARP</i> <i>before</i>	<i>MARP</i> <i>after</i>	<i>MASP</i> <i>before</i>	<i>MASP</i> <i>After</i>	<i>RFISI</i> <i>before</i>	<i>RFISI</i> <i>after</i>
Group A (Range)	76 (38-112)	42 † (16-108)	144 (73-336)	191 (79-286)	0 (0-21)	12) ‡ (0-39)
Group B (Range)	79 (26-109)	71 † (40-93)	151 (35-275)	121 (57-229)	5 (0-48)	6 ‡ (0-33)

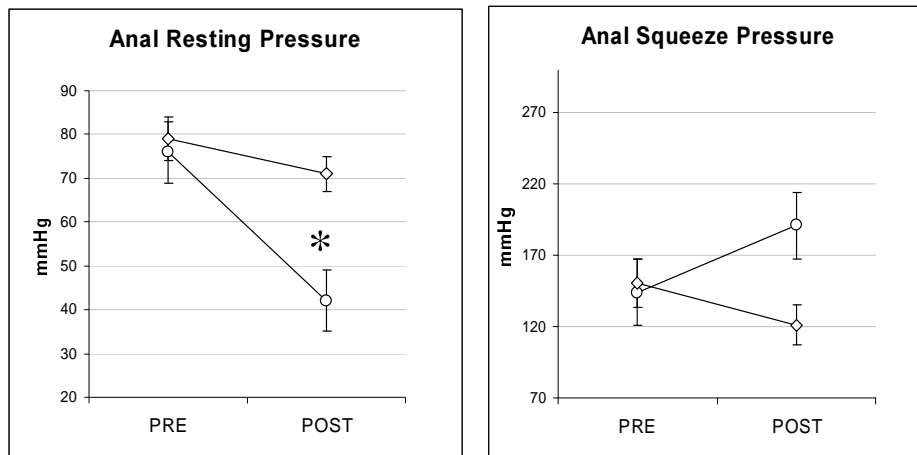
**Table 6.2;** Mean anal resting pressure, Maximal anal Squeeze pressure and Rockwood Fecal Incontinence Severity Index before and 12 weeks after the operation. †:  $p = 0,04$  (paired t-test), ‡:  $p = 0,038$  (paired t-test)

### manometry

Group A (Parks) and group B (Scott) had similar values for MARP before the operation. (median, respectively 77 and 79 mmHg). The same applied for preoperative MASP values (151 mmHg in both groups). In group A, the median MARP dropped significantly from 79 mmHg to 41 mmHg ( $p < 0.01$ ). In group B, median MARP dropped from 79 to 66 mmHg ( $p = 0.03$ ). When comparing the change from baseline of MARP between group A and group B, a statistically significant difference was observed ( $p = 0.04$ ) with median changes of respectively 35 mmHg and 12 mmHg (figure 6.2). After the operation no significant change in median MASP was observed within either group ( $p > 0,50$ ) (figure 6.2). The observed changes did not significantly differ between groups ( $p = 0,59$ )

### fecal continence

Prior to the fistula repair similar Rockwood Fecal Incontinence Severity Indices (RFISI) were found in both groups ( $p = 0.47$ ). Three months after the operation the Rockwood Fecal Incontinence Index rose (depicting a deterioration of fecal continence) from a median of 0 to a median of 12 in group A ( $p < 0.01$ ).



**Figure 6.2;** Anal Manometry (median  $\pm$  SEM) before and twelve weeks after surgery. (○ Indicates Group A (Parks)), (◇ Indicates Group B (Scott)), \* indicates a significant difference between groups ( $p = 0.04$ )

In group B the median RFISI increased from a median of 5 to a median of 6. When comparing the change from baseline in RFISI between group A and group B, a statistically significant difference ( $p=0.038$ ) was observed with median changes respectively 6 and 0. Prior to the fistula repair both groups showed a similar continence score according to Parks ( $p= 0.50$ ). Thirteen patients (43 percent) were fully continent before the operation (Parks I). Four of these patients (31 percent) encountered soiling and/ or incontinence for gas after the procedure (Parks II). None of these patients complained of accidental bowel movements. Continence impairment was only observed in group A. Thirteen patients (43 percent) presented with mild continence disturbances at the time of admission to our hospital (incontinence for gas or soiling; Parks II). Three of these patients (23 percent) encountered incontinence for solid stool after the procedure.

## DISCUSSION

Transanal advancement flap repair (TAFR) is advocated as the treatment of choice for patients with a high transsphincteric perianal fistula, passing through the upper or middle third of the external anal sphincter. According to many authors, this procedure enables the healing of most fistulas without subsequent damage to the anal sphincters. This assumption was supported by initial reports from the eighties. In none of these papers impairment of continence was observed as side-effect of this procedure<sup>3,4</sup>. According to other studies, however, the incidence of disturbed continence following TAFR varies between 8 and 15 percent<sup>6-8</sup>. In a previous study, conducted at our institution, an even higher incidence of disturbed continence was observed<sup>9</sup>. In an invited editorial Aguilar<sup>13</sup> stated that this unexpected high incidence of continence disturbances is probably due to the inclusion of internal sphincter fibers in the flap. This seems to be a plausible explanation. However, Ortiz and coworkers<sup>7</sup> performed a TAFR in a large series of 91 patients with a transsphincteric fistula. They also included fibers of the internal anal sphincter in all their flaps. They found impaired continence in only eight percent of their patients. Based on this report, it seems unlikely that inclusion of internal sphincter fibers in the flap is the only contributing factor to the impairment of continence following TAFR. It is noteworthy that Ortiz and coworkers utilized a Hill-Ferguson speculum during all their repairs. It might be possible that the use of this instrument is associated with less sphincter damage than the use of a Parks' retractor. Until now only one study, aimed at evaluating the impact of Parks' anal retractor on anal sphincter function, has been conducted. Van Tets and coworkers conducted a prospective, randomized study in patients, who underwent a closed hemorrhoidectomy<sup>2</sup>. Forty patients were randomized and underwent the procedure with or without the use of a Parks' retractor. Comparing both groups, anal resting pressure was found to decline in 23



and 8 percent of the patients respectively. Even though this difference is not statistically significant, this finding indicates that the use of a Parks' retractor adversely affects the integrity of the internal anal sphincter. Van Tets and coworkers suggested that overstretching of the anal sphincters by a Parks' retractor results in rupture of small nerve branches and consequently to denervation of muscle fibers. In animal studies it has been shown that<sup>14</sup> prolonged stretching can lead to local necrosis of external anal sphincter fibers. It seems likely that these factors also contribute to the decreased internal sphincter tone observed in our patients in whom a Parks' retractor was used to gain exposure. Willis and coworkers performed a TAFR in 12 patients with a transsphincteric fistula. During this procedure they used a Parks' retractor in all their patients. These authors observed a statistically significant decrease in anal resting pressure, as well as anal squeeze pressure of about 20 percent. Despite these significant pressure drops they did not observe any postoperative incontinence. It is noteworthy that they assessed postoperative continence only at 6 weeks after the procedure. This very short follow-up might account for the low incidence of incontinence, as reported by these authors. The Scott retractor is a ring retractor with multiple skin hooks on elastic bands. Utilizing this type of retractor the distal part of the anal canal is 'everted', thereby providing an excellent exposure, whereas the amount of stretch on the anal sphincters is kept to a minimum (figure 6.1). Because no blades are inserted into the anal canal, the pressure on the internal anal sphincter is minimized, thereby reducing the risk of local necrosis. The present study shows a significant increase in the Rockwood Fecal Incontinence Severity Index after the use of Parks' retractor in fistula repair. Such an increase was not found after the use of a Scott retractor. These findings indicate that use of a Parks' retractor is a major contributing factor to the impairment of continence after surgical repair of perianal fistulas.

## CONCLUSION

The use of a Parks' retractor during perianal fistula repair has a deteriorating effect on fecal continence, probably due to damage of the internal anal sphincter. Since this side effect was not observed after the use of a Scott retractor, we advocate this retractor during all fistula repairs.

## REFERENCES

1. Lunniss PJ, Kamm MA, et al. Factors affecting continence after surgery for anal fistula. *Br J Surg* 1994; 81:1382-5
2. Van Tets WF, Kuijpers HC. Continence disorders after anal fistulotomy. *Dis Colon Rectum* 1994; 37:1194-7
3. Wedell J, Meier zu Eissen P, Banzhaf G and Kleine L. Sliding flap advancement for the treatment of high level fistulae. *Br J Surg* 1987; 74: 390-1
4. Shemesh EI, Kodner IJ, Fry RD and Neufeld DM. Endorectal sliding flap repair of complicated anterior anoperineal fistulas. *Dis Colon Rect* 1988; 31: 22-4
5. Willis S, Rau M, et al. Chirurgische therapie hoher anorectaler und rectovaginaler fisteln mittels transanaler endorectaler verschliebelappenplastik. *Chirurg* 2000; 71: 836-840
6. Aguilar PS, Plasencia G, Hardy TG, Hartman RF and Stewart WRC. Mucosal advancement in the treatment of anal fistula. *Dis Colon Rect* 1985; 28: 496-8
7. Ortiz H, Marzo J. Endorectal flap advancement repair and fistulectomy for high transsphincteric and suprasphincteric fistulas. *Br J Surg* 2000; 87: 1680-1683
8. Golub RW, Wise WE, Kerner BA, et al. Endorectal mucosal advancement flap: the preferred method for complex cryptoglandular fistula in ano. *J Gastrointest Surg* 1997; 1: 487-491
9. Schouten WR, Zimmerman DD, Briel JW. Transanal advancement flap repair of transsphincteric fistulas. *Dis Colon Rectum* 1999; 42: 1419-23
10. Van Tets WF, Kuijpers JHC, Tran K, Mollen R and van Goor H. Influence of Parks' anal retractor on anal sphincter pressures. *Dis Colon Rect* 1997; 40: 1042-5.
11. Rockwood TH, Church JM, Fleshman JW, et al. Patient and surgeon ranking of the severity of symptoms associated with fecal continence. *Dis Colon Rectum* 1999; 42:1525-1532
12. Cintron JR, Park JJ, Orsay CP. Repair of fistulas-in-ano using fibrin adhesive. *Dis Colon Rectum* 2000; 43: 944-950
13. Aguilar PS. Invited Editorial. *Dis Colon Rectum* 1999 Nov;42(11): 1422-3
14. Li L, Zhang JZ, Lu GW, He GR, Lui XH, Damaging effects of anal stretching on the external anal sphincter. *Dis Colon Rectum* 1996 Nov; 39(11): 1249-54