Influence of Parks' Anal Retractor on Anal Sphincter Pressures

W. F. van Tets, M.D., Ph.D.,* J. H. C. Kuijpers, M.D., Ph.D.,† K. Tran, M.D.,† R. Mollen, M.D.,† H. van Goor, M.D., Ph.D.†

*From *The Department of Surgery, Lukas-Andreas Hospital, Amsterdam, and †University Hospital, Nijmegen, The Netherlands*

PURPOSE: The effects of the Parks' anal retractor on anal sphincter function were studied in a prospective, randomized trial. A closed hemorrhoidectomy was performed intra-anally in 20 patients using the Parks' anal retractor; in 20 other patients, the procedure was done perineally without the use of a retractor. METHODS: Anal manometry was performed before and at 6 and 12 weeks after hemorrhoidectomy. RESULTS: Mean squeeze pressure decreased by 4 percent whether or not a retractor was used. Mean resting pressure decreased by 23 percent after use of Parks' anal retractor ($P = 0.01$) compared with 8 percent when it was not used ($P > 0,05$). CONCLUSIONS: The internal anal sphincter is easily damaged with the use of the Parks' anal retractor. When possible, its use should be avoided to obtain better manometric and functional results. [Key words: Anal manometry; Hemorrhoidectomy; Continence disorders]

van Tets WF, Kuijpers JHC, Tran K, Mollen R, van Goor H. Influence of Parks' anal retractor on anal sphincter pressures. Dis Colon Rectum 1997;40:1042–1045.

Impaired fecal continence is the feared complication of anorectal surgery. Major continence disorders hardly ever occur, but the incidence of minor continence disorders is considerable.[1] This is understandable after sphincter-dividing procedures, but it is surprising that the incidence is only slightly less after nonsphincter-dividing procedures. Local scarring or keyholes obviously are not the explanation. It has been suggested that the anal retractor plays a causative role. We have studied the effects of the Parks' anal retractor on anal sphincter functions in a prospective, randomized study.

PATIENTS AND METHODS

From March 1993 to October 1994, 40 patients with symptomatic third-degree hemorrhoids were studied. All had normal continence preoperatively.

A three-quadrant closed hemorrhoidectomy according to Ferguson was performed in the jackknife position in all patients. Randomization was done for the use of an anal retractor preoperatively. Twenty patients (10 males; age, 30–63 (mean age, 46) years) underwent intra-anal hemorrhoidectomy using the Parks' anal retractor. The other 20 patients (10 males; age, 28–69 (mean age, 47) years) underwent perineal hemorrhoidectomy without using a retractor. The groups were comparable for gender and age.

A narrow elliptical incision was made over the hemorrhoidal complex extending from the perineal skin to the lower rectal mucosa. Skin, mucosa, and hemorrhoidal tissue were removed down to the underlying internal sphincter muscle. Mucosal flaps were raised, and hemorrhoidal tissue was dissected and excised from beneath these flaps. The wound was closed with a running suture of 4-0 polyglycolic acid.

When the Parks' retractor was used, it was opened up to 13 clicks, and the procedure was performed intra-anally. This position was selected because opening the anal retractor up to 12 to 14 clicks is common in our routine daily use. It gives adequate exposure, and the resistance encountered is low. The width of the slightly curved blades of the Parks' retractor is 2 cm. Opening the retractor in this mode creates a square opening measuring 2 × 4 cm, with the widest diameter measuring 4.5 cm.

When the operation was done without the Parks' retractor, the hemorrhoidal complex was pulled outside of the anal canal and excised, and the wound was closed as previously described. Digital anorectal examination was performed after the operation to confirm that the sutured wound extended over the full length of the anal canal, from the perineal skin into the lower rectal mucosa. Postoperative fecal continence was classified according to Browning and Parks[2] (Table 1).

Anal manometry was performed preoperatively and at 6 and 12 weeks postoperatively (Table 2). Normal values of resting pressure range from 40 to 100 mmHg and of squeeze pressure from 50 to 280 mmHg.[3] The preoperative and postoperative manometric data were studied and compared between groups. Differences between preoperative and post-

No reprints are available.

Table 1.
Comparison of Degree of Continence Before and After Hemorrhoidectomy Using the Classification According to Browning and Parks[2]

Degree of Continence	Use of Anal Retractor	Preoperative		Postoperative	
		Yes	No	Yes	No
A	Continent for solid and liquid stool and flatus	20	20	17	18
B	Continent for solid and liquid stool but not flatus	0	0	0	1
C	Continent for solid stool but no control of liquid stool and flatus	0	0	3	1
D	Complete incontinence, continuing fecal leakage	0	0	0	0

An anal retractor was used in 20 patients.

Table 2.
Mean anal manometric data (mmHg) in 40 Patients Before and 6 and 12 Weeks After Hemorrhoidectomy

	Retractor				No Retractor			
	Mean	Range	SD	*P*	Mean	Range	SD	*P*
Resting pressure								
Week 0	109	63–160	29.0		104	51–161	27.6	
Week 6	81	37–134	30.1	0.01*	87	44–147	27.7	0.01*
Week 12	84	38–135	30.0	0.01*	93	38–200	36.2	0.26
% Age at 12 weeks	23				11			
Squeeze pressure								
Week 0	90	27–186	48.7		111	28–386	87.0	
Week 6	97	29–218	52.4	0.26	98	18–258	66.3	0.26
Week 12	90	21–251	54.1	0.82	102	17–246	67.5	0.82
% Age at 12 weeks	0				8			

SD = standard deviation.
Twenty patients were operated on using an anal retractor.
* Decrease in resting pressure was significant ($P = 0.01$) after six weeks in both groups. After 12 weeks, resting pressure decrease remained statistically significant after use of Parks' retractor ($P = 0.01$).

operative manometric data were interpreted as the results of the operative procedure. Differences between groups were interpreted as the effects of the anal retractor on anal sphincter functions. Statistical analysis was done with the paired *t*-test.

RESULTS

Both after perineal and intra-anal hemorrhoidectomy, the scars extended from the perineum up to the rectal mucosa, running over the full length of the anal canal. Differences in manometric data between both groups could, therefore, not be explained by different lengths of the scars.

There were no postoperative complications. After three months, five patients reported minor continence disorders (Table 1).

Postoperatively, both resting and squeeze pressures decreased (Table 2). Mean squeeze pressure decreased by 4 percent, whether or not a retractor was used ($P > 0.05$). Mean resting pressure decreased by 23 percent after use of the Parks' retractor ($P = 0.01$) compared with 8 percent when it was not used ($P > 0.05$).

Preoperative resting pressures were normal in all patients, whereas squeeze pressures were below normal levels in six patients. None of these had continence disorders.

Postoperative pressures were below the normal level in 12 patients. Only three of these patients had continence disorders. Five patients had resting pressures and eight had squeeze pressures below normal levels (pre-existing in 4). Manometric data were normal in two more patients with continence disorders.

DISCUSSION

Major continence disorders after anorectal surgery occur rarely, but the incidence of minor continence disorders is considerable, varying from 10 to 50 percent.[1] This is understandable for sphincter-dividing procedures such as fistulotomy[4–7] or sphincterotomy[8–10] because partial or total division of a sphincter leads to impaired function.[11] It is surprising,

however, that the incidence is only slightly less after nonsphincter-dividing (trans)anal procedures such as anal stretch,[12, 13] hemorrhoidectomy,[14, 15] advancement flaps,[16] and hand-sutured ileoanal anastomosis.[17] Local scarring or keyholes obviously are not the explanation.

It has been suggested that the anal retractor plays a causative role. To gain adequate access to the anal canal and beyond, the anal sphincters are easily overstretched, resulting in rupture of small nerve branches and denervation of muscle fibers. Denervation is indeed found in patients with continence disorders caused by anal stretch procedures.[18] During construction of an anal anastomosis, use of an anal retractor was avoided by applying the double stapling technique; manometric and functional results were considerably improved. Soiling decreased from 50 to 10 percent, and postoperative resting pressures were increased.[19–21]

In this study, there was a statistically significant decrease in mean resting pressure at six weeks after hemorrhoidectomy in both groups. Several authors have reported on this manometric phenomenon.[22, 23] It is suggested that anal resting pressure increases when hemorrhoids are present, because of a reflex tonic contraction of the internal anal sphincter, and returns to normal after hemorrhoidectomy. After application of the Parks' anal retractor, the decrease of mean resting pressure persisted after 12 weeks and was twice as high as when a retractor was not used.

Statistically, the differences in postoperative mean resting pressure between both groups was not significant because of the wide range of manometric values. But there was a significant clinical difference because the manometric difference was present both after 6 and 12 week. It is, therefore, concluded that the internal sphincter is easily overstretched by an anal retractor. It is also concluded that impaired sphincter function does not always have to result in impaired continence.

Impaired resting pressure combined with a normal squeeze pressure is frequently found in patients with continence disorders after anorectal surgery.[1] The clinical picture of this manometric phenomenon is anal soiling, an annoying and irritating disorder that easily interferes with normal social behavior.

CONCLUSION

We, therefore, recommend avoiding the use of an anal retractor or minimizing the extent of retraction in anorectal surgery whenever possible. This would help prevent any sphincter function impairment that might arise from anal retraction.

REFERENCES

1. Kuijpers JH. Colorectal physiology: fecal incontinence. Boca Raton: CRC Press, 1994:65–7.
2. Browning GG, Parks AG. Postanal repair for neurogenic fecal incontinence: correlation of clinical results and anal canal pressures. Br J Surg 1983;70:101–4.
3. Kuijpers HC, Scheuer M. Disorders of impaired fecal control: a clinical and manometric study. Dis Colon Rectum 1990;33:207–11.
4. van Tets WF, Kuijpers HC. Continence disorders after anal fistulotomy. Dis Colon Rectum 1994;37:1194–7.
5. van Tets WF, Kuijpers JH. Seton treatment of perianal fistula with high anal or rectal opening. Br J Surg 1995; 82:895–7.
6. Marks CG. Ritchie JK. Anal fistulas at St. Marks Hospital. Br J Surg 1977;64:84–91.
7. Lilius HG. Fistula in ano: an investigation of human foetal anal ducts and intramuscular glands and a clinical study of 150 patients. Acta Chir Scand Suppl 1968;383: 7–88.
8. Bennett RC, Coligher JC. Results of internal sphincterotomy for anal fissure and stenosis. BMJ 1962;2:1500–1.
9. Walker WA, Rothenberger DA, Goldberg SM. Morbidity of internal sphincterotomy for anal fissure and stenosis. Dis Colon Rectum 1985;28:832–5.
10. Khubchandani IT, Reed JF. Sequelae of internal sphincterotomy for chronic fissure in ano. Br J Surg 1989;76: 431–4.
11. Belliveau P, Thomson JP, Parks AG. Fistula-in-ano: a manometric study. Dis Colon Rectum 1983;26:152–4.
12. Goligher JC, Graham NG, Clark G, de Dombal FT, Giles G. The value of stretching the sphincters in relief of post hemorrhoidectomy pain. Br J Surg 1969;56:859–61.
13. Hancock BD. Lord's procedure for hemorrhoids: a prospective anal pressure study. Br J Surg 1981;68:729–30.
14. Read MG, Read NW, Haynes WG, Donnelly TC, Johnson AG. A prospective study of the effect of hemorrhoidectomy on sphincter function and fecal incontinence. Br J Surg 1982;69:396–8.
15. Goligher JC. Surgery of the anus, rectum and colon. 4th ed. London: Bailiere & Tindall, 1980.
16. Shemesh EI, Kodner IJ, Fry RD, Neufeld DM. Endorectal sliding flap repair of complicated anterior anoperineal fistulas. Dis Colon Rectum 1988;31:22–4.
17. Rothenberger DA, Vermeulen FD, Christenson CE, *et al.* Restorative proctocolectomy with ileal reservoir and ileoanal anastomosis. Am J Surg 1983;145:82–8.
18. Snooks SJ, Henry MM, Swash M. Fecal incontinence after anal dilatation. Br J Surg 1984;71:617–8.
19. Keighley MR. Abdominal mucosectomy reduces the in-

cidence of soiling and sphincter damage after restorative proctocolectomy and J-pouch. Dis Colon Rectum 1987;30:386–90.
20. Tuckson W, Lavery I, Fazio V, Oakley J, Church J, Milson J. Manometric and functional comparison of the ileal pouch anal anastomosis with and without anal manipulation. Am J Surg 1991;161:90–5.
21. Braun J, Treutner KH, Harder M, Lerch MM, Tons Chr, Schumpelick V. Anal sphincter function after intersphincteric resection and stapled ileal pouch-anal anastomosis. Dis Colon Rectum 1991;34:8–16.
22. Hancock BD. Internal sphincter and the nature of hemorrhoids. Gut 1977;18:651–5.
23. Arabi Y, Alexander-Williams J, Keighley M. Anal pressures in haemorrhoids and anal fissure. Am J Surg 1977; 134:608.