Overlapping anal sphincter repair for faecal incontinence due to sphincter trauma: five year follow-up functional results

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Abstract. Disruption of the anal sphincter results from obstetric injury, ano-rectal operations or external trauma. Obstetric or surgical division of the sphincteric mechanism may not be immediately apparent and the clinical presentation of incontinence may occur several years later [1, 2]. Reconstruction of the sphincter using a fascial sling or direct end-to-end repair of the disrupted sphincter result in a high failure rate. Failure after direct end-to-end repair is usually caused by break down of the suture line owing to retraction of the muscle ends [3]. Parks advocated an overlapping repair [4] in which the disrupted ends of the sphincter were mobilised and wrapped around each other. This paper reports the results of overlapping sphincter repair for faecal incontinence resulting from trauma, after a 5 year follow-up period.

Résumé. Une rupture de l’anneau sphinctérien anal peut résulter de lésions obstétricales, de séquelles d’interventions chirurgicales et de lésions traumatiques. Les ruptures obstétricales ou chirurgicales du sphincter peuvent ne pas être immédiatement apparentes et le développement clinique de l’incontinence peut survenir plusieurs années après la lésion. La reconstruction du sphincter avec un lambeau de fascia ou la réparation directe bord à bord du sphincter rompu se soldent par un taux élevé d’échecs. L’échec après suture bord à bord est dû à la desunion de la suture en raison d’une rétraction des extrémités musculaires. Parks avait recommandé une suture en gilet dans laquelle les deux extrémités du sphincter rompu sont mobilisées et suturées après chevauchement. Cet article rapporte le follow-up à 5 ans de ruptures sphinctériennes d’origine traumatique traitées par chevauchement des extrémités sphinctériennes.

Patients

From January 1984 to December 1989, 144 patients with faecal incontinence due to sphincter injury underwent an overlapping sphincter repair. Sixteen patients were excluded, these included 15 in whom no follow-up after the operation was recorded (11 lived abroad and 4 were lost of follow-up) and in 1 patient the hospital note could not be found.

128 patients were included in the study. There were 100 females and 28 males, with a mean age of 43.4 years (range 16–77).

The preoperative symptoms, clinical findings, results of manometric studies and findings on postoperative follow-up of all patients were recorded on a proforma. The present functional status was determined by postal questionnaire.

The severity of incontinence was graded according to the Browning and Parks classification [5] into four categories as follows: A) continent to gas, liquid and solid stools, B) continent to solid and usually liquid stools but not to flatus, C) continent only to solid stools, D) incontinent even to solid stools.

In addition an assessment of the frequency of incontinence episodes was made. The outcome of the procedure was considered excellent when full control of solid and liquid faeces and flatus was achieved, good when there was continence to faeces but not to flatus or when a leak of liquid stool occurred less or equal to one episode per week, fair when patients could control solid faeces only or suffered incontinent episodes more than once a week and poor (failed) when only partial control of solid faeces was obtained or when a permanent colostomy was required.

Statistical analysis was carried out using the Chi square test and the two-tailed Wilcoxon signed rank test. Results were quoted as statistically significant if the probability of chance occurrence was less than five percent.

All patients were operated in the lithotomy position under general anaesthesia. Bowel preparation was performed as for colonic surgery and antibiotic prophylaxis given in all cases. The surgical technique has been previously described [4–6].

In the 128 patients the severity of incontinence preoperatively was classified as B in 6 (4.7%), C in 33 (25.8%) and D in 81 (63.3%). In 8 patients who were referred with a loop colostomy the degree of incontinence could not be fully assessed.

Injury to the external sphincter was caused by obstetric trauma in 82 (64.1%) patients, operations for fistula in 24 (18.8%) patients, external trauma in 13 (10.1%) patients and iatrogenic after other ano-rectal procedures in nine (7.0%). This latter group included 3 patients who had had excision of presacral dermoid, 3 a maximal anal dilatation, 1 a haemorrhoidectomy, 1 an anoplasty for a congenital funnel anus deformity and 1 a radical vulvectomy. The mean time elapsed between the initial presentation of symptoms and the sphincter repair was 60.1 months (1–516 months).

Thirteen patients in the obstetric injury group had had previous operations before referral. Three had had 2 procedures and 4 had 3. In 11 of them a previous attempt to repair the incontinence was
carried out. An immediate sphincter repair was performed in 3 patients, an overlapping sphincter repair was attempted in 5 cases and a postanal repair was carried out in another 3. In the remaining 2 cases closure of a rectovaginal fistula was performed before referral. Rectovaginal fistula was present in 7 cases as a direct consequence of the obstetrical tear. Patients with a fistula-in-ano had had an average of 2.7 operations for fistula management before the sphincter repair was performed.

An anterior repair was carried out in 88 patients. Of the other 40 patients, 16 had a posterior repair and 24 a lateral repair. In 16 another procedure was simultaneously performed including plication of the puborectalis muscle in 7, repair of a rectovaginal fistula in 4, a posterior vaginal repair in 2 and other miscellaneous procedures in 3. In 87% of the repairs non-absorbable sutures were used (polypropylene 72 (56.3%), polyamide 28 (21.9%), wire 14 (10.9%)). The incidence of infective complications was not significantly different when non-absorbable or absorbable sutures were used (14.5% and 23.5% respectively; $\chi^2 = 0.8160$, $P > 0.5$).

A colostomy was performed at the time of the repair in 19 cases (14.8%). Of these 17 were subsequently closed. Of the 22 patients who had received a temporary colostomy previous to the repair, 21 had colostomy closed.

Early complications (< 30 days postoperative) developed in 32 patients (25%). The most frequent was wound infection in 20 cases (15.6%) which led to breakdown of the repair in 3. Two of these were reoperated and 1 still has a colostomy. Impaction occurred in 9 patients and led to breakdown of the repair in 1, who required reoperation. Two patients developed a haematoma and 1 developed cellulitis which resolved spontaneously. Late complications occurred in 12 cases (9.3%). The most frequent were recurrence of fistula-in-ano in 4 cases, stricture in 3 and formation of a sinus in 3. Other late complications were small bowel obstruction in one patient and pain which required removal of wire in one case. The mean stay in hospital after the repair was 14.4 days (range 5–57 days).

### Results

Ninety four of the 128 patients answered the postal questionnaire. In these the follow-up period ranged from 12–98 months (median 58.5 months).

The functional results were as follows: excellent in 13 patients (13.8%), good results in 34 (36.2%), fair in 24 (25.5%) and poor in 23 (24.5%) of whom eleven (8.6%) still had a permanent colostomy (8.6%).

![Fig. 1. Overlapping sphincter repair. Cause and results. Result: ■ excellent; □ good; △ fair; ▼ poor poor](image)

### Table 1. Functional results and the presence or absence of pudendal neuropathy according to preoperative manometric assessment in the 94 patients fully evaluated

<table>
<thead>
<tr>
<th>Preoperative neuropathy</th>
<th>Excellent (%)</th>
<th>Good (%)</th>
<th>Fair (%)</th>
<th>Poor (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>1 (7.6)</td>
<td>5 (7.2)</td>
<td>8 (50)</td>
<td>6 (35.2)</td>
<td>20 (21.3)</td>
</tr>
<tr>
<td>Absent</td>
<td>12</td>
<td>29</td>
<td>16</td>
<td>17</td>
<td>74</td>
</tr>
</tbody>
</table>

$\chi^2 = 16.76$, df=3, $P < 0.001$

The cause of injury to the sphincter was not a significant factor in the final outcome ($\chi^2 = 10.9995$, df=9, $P > 0.25$) (Fig. 1). Of the 94 patients having preoperative and postoperative physiology tests, 20 showed evidence of neuropathy. The preoperative physiologic tests demonstrated there was however a relationship between function and the presence or absence of pudendal neuropathy preoperatively ($\chi^2 = 16.76$, df=3, $P < 0.001$) (Table 1). Of the 23 patients with a poor result 13 had had obstetric injury of whom seven had evidence of pudendal neuropathy. Patients having an anterior repair had better results compared with those located posteriorly or laterally ($\chi^2 = 15.9$, df=6, $P < 0.025$) (Table 2, Fig. 2). There was no difference in the long term functional result among those who received a colostomy at the time of the repair compared with those who did not ($\chi^2 = 0.004$, $P > 0.5$).

Pre- and postoperative manometric measurements were available in 40 of the 94 patients who answered the questionnaire.

The postoperative manometric assessment performed at a mean of 21.6 months (range 1–58 months) (Table 3) showed that sphincter repair resulted in a significant rise in the resting pressure ($P = 0.0396$) and voluntary contraction ($P = 0.0451$). In patients in whom improvement was achieved there was a significant increase in voluntary contraction pressure ($P = 0.0038$). No significant increase