The evolution of laparoscopic surgery for rectal prolapse

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ABSTRACT

External rectal prolapse is defined as a full thickness extrusion of the rectum outside of the anus. In patients who are fit enough, it is usually treated with surgical intervention. The surgical focus has traditionally been on reduction of the prolapse, rather than improvement in function. Internal rectal prolapse is also well recognised, being a folding of the full thickness of the rectal wall that occurs on straining to defecate, but that does not protrude outside of the anus. It may present with either obstructed defecation or faecal incontinence. In contrast to external prolapse surgery for internal rectal prolapse has enjoyed a poor reputation, in part due to the poor results of surgery in the late 1980s but also because of the suggestion that internal prolapse is an incidental finding. The introduction of surgical techniques that focus on functional outcomes in external prolapse surgery have led to a reappraisal of the treatment of internal rectal prolapse. This coupled with new evidence regarding the morphology of symptomatic internal prolapse has quashed the concept of internal prolapse as an untreatable and incidental phenomenon.

This article will outline the evolution of surgery for rectal prolapse, the use of laparoscopic ventral rectopexy in external prolapse and the evaluation and treatment of patient with internal rectal prolapse.

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1. The evolution of rectal prolapse surgery

1.1. External rectal prolapse

The choice of treatment in patients with external rectal prolapse has traditionally involved a decision between either a perineal or transabdominal approach. A perineal approach is favoured in the elderly and a transabdominal approach usually reserved for younger patients.

The two most popular perineal approaches are a Delorme's procedure and Altmeier operation. A Delorme's procedure involves a perineal resection of rectal mucosa from just above the dentate line followed by a rectal muscular wall plication. By contrast, an Altmeier operation is a perineal rectosigmoidectomy, in which the prolapse is resected and a coloanal anastomosis fashioned. Whilst these operations have a low morbidity and may be performed under spinal anaesthesia in the frail and elderly, they are associated with a high recurrence rate. They can easily be repeated, however, especially in the case of the Delorme's procedure. A Cochrane review has suggested a poorer resolution of symptoms of incontinence, perhaps related to stretching of the sphincter during surgery.

The perineal approach to external prolapse had remained relatively unchanged, until recently. Stapled techniques for excision of small external prolapse are now well described as is external pelvic rectal suspension (Express procedure), although these techniques have not gained popularity.

There has been interest in abdominal approaches to external prolapse as many surgeons perceive that there is a lower recurrence rate compared to the perineal approach. This is despite a recent Cochrane review of a dozen trials containing 380 patients, showing no demonstrable difference between the approaches. The results of a multicentre randomised trial comparing the two approaches are awaited. There has been considerable evolution of transabdominal approaches in recent years with three areas of debate: access, type and extent of rectal mobilisation and method of rectal fixation.

Laparoscopic access, despite the lack of large randomised trials is becoming increasingly accepted as the approach of choice for patients undergoing prolapse surgery. Small trials have however confirmed the reduction in morbidity and cost compared with the open approach in the short term, acceptable recurrence rates and good functional results in a longer term follow up of one cohort. It is also the authors' view that elements of the rectal dissection, especially with an anterior approach are extremely
difficult to visualise at open surgery and are facilitated by a laparoscopic technique. Robotic surgery has also been employed but has not demonstrated an advantage in comparative studies, and at present has a longer operating time and higher costs.\(^{7,18}\) The theoretical advantage of reducing the learning curve by using robotics has not been evaluated, but remains attractive.

Posterior rectal dissection remains the most commonly used technique for patients with external prolapse. It has been shown that unless a rectal dissection to the pelvic floor is performed the recurrence rate is unacceptably high.\(^{19}\) It has also been shown that the extent of posterior rectal dissection is related to the incidence of post-operative deterioration in constipation or induction of new onset constipation, most probably due to rectal denervation.\(^{19}\) One small study has shown both induction of new onset constipation and an increase in colonic transit time in patients undergoing posterior rectopexy. Longer term follow up of patients undergoing posterior rectopexy has also confirmed that up to a third of patients may experience a worsening in constipation.\(^{14}\) This has lead some surgeons to attempt to offset this by resection of the redundant sigmoid at the time of rectopexy in patients with pre-operative constipation (resection rectopexy). Of course one must accept the morbidity associated with colonic resection which includes anastomotic leak and late stenosis requiring either resection or dilatation.\(^{20,21}\)

Several methods of rectal fixation have been employed, including Ivalon Sponge, non-absorbable mesh and suture only repair, with none showing significant benefits over another.\(^{22–24}\) Some authors have elected for resection and rectal mobilisation without fixation.\(^{25}\) A pragmatic approach would be that in the absence of colonic resection, mesh fixation offers the most durable repair. Combining laparoscopy with an approach that minimises denervation and the need for resection, led to the development of a limited dissection anterior rectal mobilisation that has been popularised by both D’Hoore and Dixon – laparoscopic anterior rectopexy.\(^{6,26}\)

### 2. The use of laparoscopic anterior rectopexy in external rectal prolapse

The number of surgeons currently performing LAR for external prolapse is not known, but three centres have published series, Leuven in Belgium and Oxford and Bristol in the UK.\(^{6,26,27}\) There are currently no randomised controlled trials. The results of the current series are outlined below in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Leuven</th>
<th>Oxford</th>
<th>Bristol</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>42</td>
<td>85</td>
<td>44</td>
</tr>
<tr>
<td>Follow up (med)</td>
<td>62m</td>
<td>29m</td>
<td>54m</td>
</tr>
<tr>
<td>Deaths or major morbidity</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Minor morbidity</td>
<td>5%</td>
<td>13%</td>
<td>21%</td>
</tr>
<tr>
<td>Recurrence</td>
<td>5%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Median length of stay</td>
<td>5 days</td>
<td>2 days</td>
<td>3 days</td>
</tr>
<tr>
<td>Improved constipation</td>
<td>84%</td>
<td>72%</td>
<td>80%</td>
</tr>
<tr>
<td>Worse constipation</td>
<td>5%</td>
<td>2%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Table 1 Published results for laparoscopic ventral rectopexy in the treatment of external rectal prolapse.

2.1. Internal rectal prolapse

Internal rectal prolapse is associated with symptoms of incomplete or difficult evacuation, straining and also faecal incontinence.\(^{1,29}\) The treatment of internal rectal prolapse has however enjoyed a mixed reputation and its standing has been damaged by the poor results of surgery in the 1980s and the suggestion that internal rectal prolapse is, in fact, an incidental finding.

The initial techniques for surgical intervention for internal rectal prolapse mirrored those for external prolapse.\(^{3,30–32}\) It should therefore not be surprising that the morbidity associated with an open abdominal operation, as well as the tendency to either worsen or induce constipation were unacceptable to patients with a benign functional condition. The surgical treatment of internal rectal prolapse was therefore denounced strongly by some authors, leading to a decade of abstinence of surgical intervention in these patients.\(^3\)

The development of laparoscopic surgery, limited dissection anterior rectopexy and the concurrent development of stapled anorectal pull-through has simplified the stapled transanal resection of rectum technique (STARR procedure) have given surgeons managing patients with internal rectal prolapse new, low morbidity and functionally effective operations. The development of these new techniques had also led us to re-evaluate the argument that internal rectal prolapse is an incidental finding.

Early papers by both Shorvon and Mellgren have long been quoted as proof that internal rectal prolapse occurs in normal subjects and that it does not progress to full thickness external prolapse.\(^{5,33}\) On closer inspection however this evidence does not stand up to scrutiny. In Shorvon’s initial study of normal volunteers, in which an internal prolapse rate of 50% is widely quoted, all grades of internal rectal folding were considered significant, a practice that is not in keeping with current assessment of these patients. If one considers only high-grade internal rectal prolapse as significant (impinging on or entering the anal canal), in keeping with the practice of most surgeons treating this condition, then the figure drops to 18%. Shorvon’s findings are also markedly different than those seen in the two largest series of symptomatic patients. Two recent well-designed comparative studies have confirmed that the internal rectal prolapse seen in asymptomatic patients is morphologically different from that seen in asymptomatic volunteers. It is obvious therefore that a uniform system of proctographic criteria for diagnosis of internal prolapse is needed to avoid this confusion.

In Mellgren’s follow up study of patient with internal rectal prolapse, over five years there was an extremely low progression to external prolapse. This is not surprising when one considers that around 50% of the original cohort of patients actually had surgery to correct internal rectal prolapse. It is likely that these high grade prolapse and therefore only patients with low grade internal prolapse remained. We have subsequently shown in an observational study that the age difference between patients with low grade prolapse and high grade prolapse is around 10 years.\(^{34}\) Whilst, we would not suggest treatment of internal prolapse to avoid an external prolapse in the future, we cannot agree with Mellgren’s view that internal prolapse is not progressive.

If one accepts that internal prolapse and external prolapse are different ends of the spectrum of the same disease, then application of similar surgical techniques to both seems reasonable. Furthermore, whilst the focus of surgery for external prolapse has often been curing the patient of a lump appearing at the anal verge, it has been noted that obstructed defaecation symptoms and faecal incontinence also improve.\(^{5,27}\) It seemed reasonable therefore to assume that similar symptoms might be improved in relation to internal prolapse.
3. The use of laparoscopic anterior rectopexy in patients with internal rectal prolapse.

The theoretical advantages of laparoscopic anterior rectopexy for internal rectal prolapse are obvious: a low morbidity intervention that avoids rectal denervation and can correct both rectocele and enterocele at the same time. Despite these advantages the decision making process for patients with internal rectal prolapse is more complex than those with external prolapse. The keys to patient selection are thorough assessment, reproducible prolapse grading and well managed conservative therapy.

Patients are best assessed in a dedicated pelvic floor clinic and should have a structured assessment including symptom scoring, both for obstructed defecation and faecal incontinence, as well as a structured clinical examination. Our current approach is to offer all patients with significant symptoms the triple assessment of proctography, physiology with ultrasound and colonic transit studies.

Proctographic internal rectal prolapse is graded according to the Oxford grading system, outlined in Fig. 1. It is important to appreciate that only full thickness prolapse of the rectal wall is considered in this classification. Grade I is defined as being prolapse that does not descend beyond the upper level of a concurrent rectocele, whilst grade II is a prolapse that descends beyond the upper level of a rectocele. By contrast, grade III prolapse impinges on the anal canal in contrast to grade IV prolapse that enters it. Grade V prolapse refers to appearance of the rectal wall beyond the anal verge. Grade III and Grade IV prolapse are considered significant and termed “high grade” or “rectoanal”. It is in these patients whom we would consider surgery if conservative measures fail.

A full course of conservative treatment, including biofeedback, should be offered, and completed, in all patients. Biofeedback may benefit some patients but its efficacy is disputed with the few published studies of its use in pelvic floor dysfunction being heterogenous and of variable quality.

The evidence for the use of laparoscopic anterior rectopexy in patients with internal rectal prolapse is growing. Table 2 (below) shows evidence of similar morbidity and mortality for the operation when applied to both external and internal prolapse. Furthermore improvement of obstructed defaecation is also similar in both groups. Table 3 below show evidence that in addition to improvement in obstructed defaecation with laparoscopic anterior rectopexy, there are significant improvements in faecal incontinence too.

4. Conclusions

There has been a significant evolution in rectal prolapse surgery in recent years.

This has resulted in the development of laparoscopic anterior rectopexy, an operation that combines the advantages of both abdominal and perineal approaches to rectal prolapse, without the disadvantages. It has been shown to be safe and to give good functional results in external rectal prolapse, and it is the authors view that LAR is now the treatment of choice for this condition. The use of LAR in carefully selected patients with internal rectal prolapse has also given excellent functional results, and

Table 2
Laparoscopic anterior rectopexy for patients with external and internal rectal prolapse: effects on obstructed defaecation symptoms.

<table>
<thead>
<tr>
<th></th>
<th>Internal prolapse</th>
<th>External prolapse</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>75</td>
<td>85</td>
</tr>
<tr>
<td>Median age</td>
<td>58 y</td>
<td>72 y</td>
</tr>
<tr>
<td>Follow up (med)</td>
<td>12 m</td>
<td>29 m</td>
</tr>
<tr>
<td>Deaths or major morbidity</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Minor morbidity</td>
<td>4%</td>
<td>11%</td>
</tr>
<tr>
<td>Recurrence</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Median LOS</td>
<td>2 days</td>
<td>2 days</td>
</tr>
<tr>
<td>Improved OD</td>
<td>80%</td>
<td>72%</td>
</tr>
<tr>
<td>Worse OD</td>
<td>0%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Table 3
Laparoscopic anterior rectopexy for patients with external and internal rectal prolapse: effects on obstructed defaecation symptoms and faecal incontinence.

<table>
<thead>
<tr>
<th></th>
<th>Eutrech, Netherlands</th>
<th>Oxford, UK</th>
<th>Bristol, UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>17</td>
<td>36</td>
<td>75</td>
</tr>
<tr>
<td>Follow up (months)</td>
<td>38</td>
<td>12</td>
<td>54</td>
</tr>
<tr>
<td>Improvement in OD</td>
<td>88%</td>
<td>86%</td>
<td>80%</td>
</tr>
<tr>
<td>Worsening of OD</td>
<td>0%</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>Improvement in incontinence</td>
<td>N/A</td>
<td>85%</td>
<td>91%</td>
</tr>
</tbody>
</table>

Fig. 1. The Oxford Prolapse Grade for proctographic grading of internal and external rectal prolapse.
randomised trials are now needed to determine the optimal treatment of these patients.

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None declared.

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**Ethical approval**
None.

**Author contribution**
C. Harinston and O. Jones performed the initial literature search and discussed the content of the article.

C. Harinston compiled the initial draft, O. Jones reviewed and revised the initial draft. Both authors agreed the final copy.

**References**