Journal of Minimal Access Surgery

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J Minim Access Surg. 2014 Jan-Mar; 10(1): 1–3.
doi: 10.4103/0972-9941.124448: 10.4103/0972-9941.124448

PMCID: PMC3902550
PMID: 24501500

Laparoscopic rectopexy for complete rectal prolapse: mesh, no mesh or a ventral mesh?

Deepraj S. Bhandarkar

Department of Minimal Access Surgery, Hinduja Hospital, Veer Savarkar Road, Mahim, Mumbai - 400016, India. E-mail: deeprajbhandarkar@hotmail.com

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Numerous surgical procedures — both perineal and abdominal — are currently practiced for the treatment of complete rectal prolapse (CRP). There are several controversies surrounding these and the evidence base comparing the various operations is scant. It is generally accepted that the abdominal operations carry a lower recurrence rate and improved functional outcome and are therefore preferred over the perineal operations.[1] The latter are reserved for those who are unfit to undergo an abdominal (in today's context, a laparoscopic) procedure.

The abdominal techniques for the treatment of CRP differ in the extent of rectal mobilization, methods used for rectal fixation and addition or omission of a sigmoid resection. In sutured rectopexy the rectum is completely mobilized down the levator ani muscles and fixed on either sides at the level of sacral promontory with sutures or tacks. The posterior mesh rectopexy involves insertion of a mesh behind a completely mobilized rectum and its fixation to the sacrum as well as to the sides of the rectum. Laparoscopic mesh rectopexy is performed with synthetic meshes such as polypropylene or absorbable meshes such as polyglactin and polyglycolic acid.[2] The case report by Mathew *et al*., in this issue[3] highlights the concern regarding problems related to a prosthetic rectopexy, which have been reported in 2-16% patients.[4] Erosion of the mesh, though rare, can result in significant morbidity and pose challenges in management. This issue also carries a retrospective comparative study by Sahoo *et al*., that shows comparable outcomes following laparoscopic sutured and mesh rectopexy.[5] These findings are commensurate with those reported in the literature. The only randomized trial comparing sutured and mesh rectopexy is from the open era and compares the (now outdated) polyvinyl sponge technique with sutured rectopexy.[6] At a median follow up of 47 months the recurrence rates were similar in both groups but a higher proportion of patients undergoing sponge rectopexy had developed postoperative constipation. In recent years, a laparoscopic sutured rectopexy has been preferred over mesh rectopexy, although there are no randomized studies that provide a head-to-head comparison of the two approaches. Another reason for abandonment of the mesh rectopexy may well be the emergence of resection-rectopexy as the procedure of choice for CRP, particularly in the United States, in patients suffering from longstanding constipation.[7] Barring a few series reporting the use of an absorbable mesh in resection-rectopexy[8] most surgeons avoid using a mesh in conjunction with a pelvic colorectal anastomosis.

Ventral rectopexy (VR) is gaining popularity in the treatment of CRP, especially in Europe. The initially described VR, known as the Orr–Loygue procedure,[9] involved anterior and posterior rectal mobilization to the level of the levator ani muscle and suturing of two meshes on to the anterolateral walls of the rectum. These meshes were then fixed to the sacral promontory. D'Hoore subsequently has described a modification[10] that entails posterior dissection limited to exposure of the sacral promontory and

dissection of the recto-vaginal septum to expose the entire anterior surface of the rectum. In men, the dissection in the recto-vesical pouch is carried to the apex of the prostate but the lateral dissection around the seminal vesicles is avoided. A strip of mesh around 15-18 cm × 4 cm is sutured to the ventral aspect of the rectum with six to eight delayed absorbable sutures (such as 2-0 polydioxanone), taking care to avoid full-thickness rectal bites. The proximal end of the mesh is anchored to the sacral promontory with sutures or tacks. The pelvic peritoneum is then approximated to extraperitonealize the mesh. With the current advancements in laparoscopic colorectal surgery VR is almost always performed as a laparoscopic VR (LVR).

Samarnayake *et al*., recently performed a systematic review of 12 non-randomized series of VR that reported on 728 patients.[11] Seven studies reported the Or–Loygue technique and in five the D'Hoore modification was used. Across various studies with median follow up ranging from 3 to 106 months the recurrence rates varied from 0-15.4%. Studies describing VR without posterior rectal mobilization reported a greater reduction in postoperative constipation than those that employed posterior mobilization. Also, a lower incidence of new-onset postoperative constipation was observed in the former group of patients as compared to the latter group. Injury to the autonomic nerves has been cited as a cause for the increased risk of constipation and the D'Hoore "autonomic-nerve sparing" operation seems to be the preferred form of VR today. The overall mean decrease in faecal incontinence rate was 44.9% (range 35.6-54.1%) The complication rates varied from 1.4-47%. Urinary tract infections and port-site hernias were the commonest complications. Complications related to the mesh included one death from sepsis 6 months after surgery, two cases of mesh detachment and one instance of erosion of the mesh into the vagina. The unusual complication of intervertebral disk infection was seen in two patients. Based on the low medium-term recurrence rates and favorable outcome data in terms of improvement in constipation as well as fecal incontinence, LVR seems to be emerging as the current procedure of choice for patients with CRP. However, there are no randomized trials comparing LVR with the well established operations such as posterior mesh or sutured rectopexy. Given the logistical difficulties, it is unlikely that such a trial will ever be conducted.

Debate continues as to which type of mesh is optimum for LVR. Smart *et al*., performed a systematic review of 13 observational studies reporting outcome of 866 patients undergoing LVR.[12] In 767 patients a synthetic mesh had been implanted and in 99 a biological one. There was no difference in recurrence (3.7 vs. 4%, $P = 0.78$) or mesh related complications (7 vs. 0% $P = 1.0$). Of note, the median follow up period documented in patients undergoing synthetic mesh placement ranged from 7 to 74 months whereas in the two studies that included patients in whom a biological mesh had been used was only 12 months. The authors suggested that biological mesh is a better option in patients with a significant risk of fistula formation, such as those with pelvic infection, sigmoid diverticular disease, Crohn's disease, previous pelvic irradiation or steroid use. Furthermore, it may prudent to use a biological mesh in young adolescents or women of child-bearing age undergoing LVR despite the higher cost.[13]

A recent paper by Badrek Al-Hamoudi and colleagues highlights the problems related to mesh and technical failures of LVR.[14] These authors reported 50 patients with early symptomatic failures ($n = 23$) or mesh-related complications ($n = 27$) after LVR referred to a specialized colorectal unit over a 6-year period. As the denominator – the total number of patients who had the LVR in the referring hospitals – was not elucidated in this paper it is difficult to ascertain the percentage of patients who developed these problems. At re-surgery the causes of failures identified were inadequate ventral dissection, improper fixation of the mesh to the anterior rectal wall, detachment of the mesh from sacral promontory, wrongly positioned staples to the upper sacrum and improper fixation of the mesh to the right rectal wall. Major mesh related complications included erosion into the vagina, bladder or rectum, mid-rectal stricture, rectovaginal fistula and chronic pelvic pain due to pudendal nerve irritation or chronic inflammation around the mesh. In the hands of these expert surgeons majority of the patients underwent revisional laparoscopic surgery that resulted in relief of symptoms and improvement in postoperative obstructed defecation and Wexner incontinence scores. The paper reinforces the message that VR is a complex procedure and its safe performance requires adequate expertise in colorectal surgery as also above average laparoscopic skills. A consensus panel of experts on VR suggested that the learning curve of LVR might well be around 50 cases.[13] This panel also advocated that likelihood of shrinkage makes heavyweight polypropylene meshes unsuitable for use in VR and the propensity of the partially absorbable meshes

(combining polypropylene and poliglecaprone) for stretching makes them a poor choice. They recommended a coated lightweight polypropylene mesh but failed to provide any data to support this thesis.

These observations beg the question whether the placement of a mesh in close proximity of a viscus can be considered at all safe? A corollary can be drawn from the recent shift in the practice in repair of paraesophageal hernia (PEH). Most surgeons have abandoned the use of synthetic or even composite meshes in the vicinity of the esophagus and diaphragmatic hiatus because of the risk of mesh erosion and other serious complications in the long-term.[15,16] Use of a biological mesh seems to reduce the risk of such complications but is associated with a higher rate of recurrence of PEH. In a randomized study by Oelschlager *et al*., the recurrence of PEH in the group undergoing repair with a biological mesh was 54% at a follow up of 58 months.[17] Given the properties and behavior of biological meshes, it is quite likely that with longer follow up more recurrences will become evident in patients undergoing LVR with this type of implant.

The conundrum of finding the "ideal" operation for treatment of CRP remains as yet unsolved. For the surgeon it is a tightrope walk between achieving durable functional outcomes coupled with a low recurrence rate on the one hand and mesh related complications on the other. Sutured rectopexy is a procedure that, although not perfect, has stood the test of time and given reasonable results. Posterior mesh rectopexy has been more or less abandoned because of the fear of mesh related complications. In the light of this it is rather intriguing that the colorectal surgical community has embraced LVR - an operation that entails fixation of a large piece of mesh in contact with the anterior wall of the rectum. The move from the use of synthetic to biological meshes may see a reduction in the number of complications, albeit at the cost of a higher recurrence rate. For the treatment of CRP jury is still out whether mesh in the ventral position will supplant the posteriorly placed mesh or indeed the practice of using no mesh. Is it perhaps likely that in years to come, with newer insights into the etiopathogenesis of CRP and development of meshes with superior characteristics, some other procedure providing better long-term outcomes with a lower morbidity will emerge and enjoy prime time?

Footnotes

Source of Support: Nil

Conflict of Interest: None declared.

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