ABDOMINAL RECTOPEXY WITH ABSORBABLE AND NON-ABSORBABLE MATERIALS IN THE TREATMENT FOR RECTAL PROLAPSE

TOMASZ KOŚCIŃSKI, WIKTOR MEISSNER, HONORATA STADNIK

Department of General, Gastroenterological Oncology and Plastic Surgery, K. Marcinkowski Medical University in Poznań
Kierownik: prof. dr hab. M. Drews

The aim of the study was to present and compare own results of abdominal rectopexy performed with absorbable and nonabsorbable materials used in surgical repair of rectal prolapse.

Material and methods. In the years 1991-2009, 50 patients were operated on for rectal prolapse. The first 8 patients (group I) were operated using absorbable polyglycolic acid mesh. The next 42 patients were operated using non-absorbable polypropylene mesh (group II). 12 patients with chronic, incurable constipation had sigmoidectomy and rectopexy performed at the same operation. Rectopexy was performed with the mesh and fixed to the pelvic fascia and periosteum and mesorectum, leaving the anterior one third of the rectum free. 6 months after surgery functional outcomes were evaluated. Statistical analysis with the level of statistical significance p<0,005 was applied to obtained functional results.

Results. On the follow up visits, there were no symptoms of the recurrence of rectal prolapse in 5 patients (62.5%) from group I and in 25 patients (92.6%) from group II. Patients relapsing were reoperated 24 to 98 months after primary surgery. In all patients from group I (absorbable mesh), prosthetic material was not found at reoperation. In redo surgery only non-absorbable mesh was used.

Conclusions. The effectiveness of rectal fixation depends on the on the durability of the prosthetic material. In the studied group polypropylene mesh was superior in rectopexy to absorbable mesh.

Key words: rectal prolapse, surgical repair, rectopexy, absorbable mesh, non-absorbable mesh

Abdominal rectopexy with the use of prosthetic material is widely recognized surgical option of treatment of rectal prolapse. The material used for repair should be sufficiently durable and well tolerated by the patient. The grafted material should not cause too much pronounced inflammatory response at the site of implantation, as that could result in rectal obstruction or erosion. The material should also be resistant to infection, so that in case of local septic complications, they will not be the source of persisting contamination. There is a variety of materials that are used for rectopexy. Best known sponges are those made of hydroxylated polyvinyl acetal (Ivalon®). One of their properties is an ability to be overgrown by connective tissue, in which they stimulate an intense fibrosis, which results in formation of cartilage-like mass. Other materials that are used for repair are non-absorbable meshes, such as Marlex®, Teflon®, or Prolene®.

In clinical practice, there are used also absorbable meshes of polyglycolic acid, polygalactine or polydioxanone (Dexon®, Vicryl®, PDS®)(1). Along with an immediate effect of mechanical fixation, they are believed to facilitate the ingrowth of the rectum into the presacral tissues. That is possible due to porous structure of the mesh that allows for the penetration of fibroblasts and causing minimal inflammatory response.
Long-term results published in relevant literature, evaluating application of any of the above mentioned materials, were similar (2, 3).

The aim of this study was to compare the results of abdominal rectopexy with absorbable (polyglycolic acid) and non-absorbable (polypropylene) prosthetic material in own material.

**MATERIAL AND METHODS**

Studied group consisted of 50 patients – 40 women and 10 men, in whom abdominal rectopexy had been performed because of rectal prolapse between 1991-2009. The age of the patients ranged from 26 to 78 years (mean 61).

In 18 patients rectal prolapse was associated with constipation, defined as passing stools less than twice a week. In 14 patients an important complaint was difficult defecation. Fecal incontinence was reported by 17 patients, incontinence to flatuses in 5.

Studies of colonic transit time with radio-opaque markers (Sitzmarks®-Konsyl Pharmaceuticals, Inc.) revealed prolonged transit with dissemination of markers throughout the entire colon in 6 patients. Whereas in 8 patients markers were accumulated in sigmoid-rectal portion, suggesting dyschisis.

Two types of prosthetic material were used for rectopexy: absorbable made of polyglycolic acid (group I) and non-absorbable made of polypropylene (group II). In the first series 8 patients were repaired with absorbable mesh. Then, beginning in the year 1999, non-absorbable meshes became available and 42 patients in group II were operated with polypropylene prosthetic material. All of the patients were operated on by the same team of surgeons, the authors of the study.

Surgical technique

Mechanical bowel cleansing was used in all operated patients. Patients were asked to drink 3-4 liters of polyethylene glycol solution (PEG 400) on the day preceding the operation. For perioperative antibiotic prophylaxis cephalosporins (at the dose of 1-2 grams) combined with metronidazole (0,5 grams) were administered intravenously 30-60 minutes before the surgery.

Patients were operated in lithotomy position. Pelvic peritoneum was opened in the lowest portion of the pouch of Douglas, exposing presacral space and mobilizing the rectum. Care was taken to avoid damage to presacral nerves and vessels. Lateral rectal ligaments were not transected.

In the group of 12 patients with constipation and difficult rectal emptying resistant to conservative treatment, sigmoidectomy including upper portion of the rectum was performed at the same surgery, always prior to rectopexy. Colonic anastomosis had been performed with biofragmentable anastomotic ring Valtrac®, and standard rectopexy as described below, was then completed.

The mesh used for rectopexy was cut into the shape of a cross. Its vertical portion was fixed with polypropylene 2-0/3-0 sutures to presacral fascia and periosteum. After pulling the rectum, these sutures were put through the visceral lamina of Waldeyer’s fascia and posterior portion of mesorectum. Lateral arms of the mesh were sutured into the lateral portions of mesorectum, leaving about 30% of anterior wall of the rectum free, which was not covered with the mesh.

The procedure was completed by high peritonization of the pelvic floor, separating the mesh from peritoneal cavity. Suction drain was left in the perirectal space for 24 hours.

There was no clinically significant blood loss in any of the rectopexies. Duration of the procedures ranged between 60 and 130 minutes (mean 75 minutes). Hospital stay ranged from 6 to 11 days (mean 8 days).

The evaluation of functional outcome of the procedure was performed 6 months after surgery and then in annual intervals.

For statistic analysis the U-Mann-Whitney test for non correlated variables was used, with the level of statistical significance p<0,05.

**RESULTS**

Postoperative evaluation was performed in 8 patients from group I (polyglycolic acid mesh) and in 27 patients from group II (polypropylene mesh). This constitutes 70% of all patients operated for rectal prolapse. 30% of the patients did not reply or refused to come for the follow-up visit.

Rectal prolapse was cured in 5 patients (62,5%) from group I and in 25 patients (92,6%) from group II. Relapse of rectal prolapse was observed in 3 patients (37,5%) from
group I, from 3 to 72 months after the operation. In one patient operated on with Dexon mesh, worsening of colonic emptying was observed. 12 months after primary operation, that patient underwent sigmocolorectal resection for that reason. Persistent anal sphincters’ insufficiency was an indication for dynamic graciloplasty.

In group II there were only two (7.4%), late relapses of rectal prolapse, 36 and 60 month after primary surgery.

Two cases of colonic obstruction were observed in group II. One was caused in 78 years old woman by an inflammatory reaction and infiltration around the implanted polypropylene mesh. The patient was reoperated and sigmoidostomy with pelvic drainage were performed. In second patient the reason for the operation was intraperitoneal adhesions 6 months postoperatively.

There were no deaths in perioperative nor postoperative period.

In both groups persistent incontinence to flatuses and stools were observed after abdominal rectopyx.

Patients relapsing with rectal prolapse were reoperated 24 to 98 months after primary surgery.

In patients from group I after implantation of an absorbable mesh, prosthetic material was not found at the reoperation. Additionally, there was not any marked fibrosis or scarring in the presacral space and around the prolapsing rectum. The redo-surgery consisted of repeated rectopyx with non-absorbable mesh.

In group II, polypropylene mesh was torn of from presacral fascia. During the reoperation the mesh was identified, isolated and widely resutured to the sacral bone. In the second patient, the mesh got separated from the pelvic walls and folded. For that patient an additional polypropylene mesh was implanted during the reoperation.

The results of surgical treatment are summarized in tab. 1.

The analysis of the reasons of the postoperative relapses of rectal prolapse was studied in former publication (4).

DISCUSSION

Rate of recurrence is the most important parameter for evaluation of methods of surgical treatment of rectal prolapse and the type of prosthetic material used. There is no consensus in relevant literature, on which type of mesh gives the best results (5). The ideal prosthesis maintains its strength in holding the descending organs and does not stimulate overactive adhesions formation, and results in adequate fibrosis for tissue healing.

The time of degradation of the polyglycolic acid or polygalactine meshes is of about 90 days, which is believed to be long enough for appropriate adhesion of the rectum to presacral fascia (1, 11). Glycol acid release during degradation may also have bacteriostatic properties (6). Perioperative antibiotic prophylaxis is also necessary to keep the operated site highly sterile. This is extremely important in patients who along with rectopyx undergo colonic resection. In group I, where the absorbable material was used, no intrabdominal infections were reported.

The recurrences of rectal prolapse, occurred most often from the 24th to 36th month after rectopyx (9). In the studied group, recurrences were reported in 37.5% of the patients from 3 to 72 months after the operation (mean 37 months). Arndt and Pircher report recur-

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<th>Group I n = 8</th>
<th>Group II n = 27</th>
<th>p value</th>
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<tbody>
<tr>
<td>Permanent fixation of the rectum</td>
<td>5 (62.5%)</td>
<td>25 (92.6%)</td>
<td>0.006</td>
</tr>
<tr>
<td>Recurrence of prolapse-reoperation</td>
<td>3 (37.5%)</td>
<td>2 (7.4%)</td>
<td>0.015</td>
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<tr>
<td>Inflammatory infiltration around the mesh</td>
<td>-</td>
<td>1</td>
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<td>Ileus</td>
<td>-</td>
<td>2</td>
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<tr>
<td>Prolapse of rectal mucosa</td>
<td>2</td>
<td>4</td>
<td>0.007</td>
</tr>
<tr>
<td>Difficult defecation</td>
<td>1</td>
<td>2</td>
<td>0.04</td>
</tr>
<tr>
<td>Incontinence to flatuses</td>
<td>1</td>
<td>3</td>
<td>0.625</td>
</tr>
<tr>
<td>Fecal incontinence</td>
<td>2</td>
<td>6</td>
<td>0.517</td>
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<tr>
<td>Surgical treatment for complications</td>
<td>2</td>
<td>2</td>
<td>0.024</td>
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rence rate of 6% in the group of 62 patients, 36 to 45 months postoperatively (1).

Lunkkonen et al. in the group of 15 patients did not see any recurrences after Dexon mesh implantation in the follow-up period from 18 to 38 months (11). Japanese authors used the same prosthetic material for the repair of relapsed rectal prolapse in 5 patients. They did not record any recurrence in the follow-up period of 36 months (10).

High rate of recurrences in group I and the absence of prosthetic material at the time of reoperation, together with the lack of proper adhesions, necessary for reliable fixation of the rectum within the pelvic tissue, prompted the authors to use nonabsorbable materials.

Recurrences occurred in patients who continued to spend long time sitting in lavatory, had to strain hard in order to void, suffered from chronic cough or kept on working hard and lifting heavy objects. Implanted meshes and tissue adhesions were exposed to considerable tension and tearing forces (4).

Patients from group II, in whom polypropylene meshes were used for rectopexy, were at lower of the recurrence of rectal prolapse, despite similar unwanted events and forces. Recurrence rate in group two was only 7.4%.

Ruptures of nonabsorbable meshes occurred later (mean after 48 months).

It seems that for precise calculation of the risk of recurrence, a longer follow-up is necessary. Unfortunately, large group of the patients is lost to long-term follow-up because of advanced age and coexisting cardio-pulmonary diseases (10).

The fear of poor tolerance of the body for polypropylene meshes and causing over-expressed tissue response, was not justified. In one case only, the authors observed high rectal stricture which had to be treated with colostomy. Neither erosions, nor infections at the site of mesh implantation were observed.

Incorporation of the prosthetic material is a healing process whereby fibrous connective tissue is deposited between the mesh filaments and is continuous with the adjacent host tissue, thus, forming a strong mechanical anchorage between the graft and the adjacent tissue (9).

In conclusion, it should be emphasized that the effectiveness of fixation of the prolapsing rectum depends on the on the durability of the prosthetic material and intensity of increase of intrabdominal pressure in the period of 2-3 years after surgery. The best prosthetic material for rectopexy in studied group was polypropylene mesh.

REFERENCES


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Adress correspondence: 60-355 Poznań, ul. Przybyszewskiego 49