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# The risk of infection of three synthetic materials used in rectopexy with or without colonic resection for rectal prolapse

**S. Athanasiadis, G. Weyand, J. Heiligers, L. Heumüller, L. Barthelmes**

Department of Coloproctology, St Joseph Hospital Duisburg Laar, Ahrstrasse 100, D-47139 Duisburg, Germany

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**Abstract.** The incidence of infection was compared after the use of synthetic implants in abdominal rectopexy with (145 patients) and without (77 patients) synchronous colon resection. Three different materials were used, including polyvinyl alcohol (Ivalon) ($n=87$), polyglactin (Vicryl) mesh ($n=109$), and Gore-Tex ($n=26$). In patients having colonic resection two (3.7%) pelvic infections occurred in the polyvinyl alcohol (Ivalon) group, one abdominal infection with polyglactin (Vicryl) and none with Gore-Tex. In the group without colonic resection, two patients (3.0%) developed infection after polyvinyl alcohol (Ivalon) insertion with none occurring after polyglactin (Vicryl) or Gore-Tex. Overall mortality was 0.4%. Follow-up ranged from 3 to 120 months. There were 3 (1.9%) cases of recurrent prolapse in 151 patients with full-thickness rectal prolapse.

**Résumé.** L'incidence d'infections a été comparée entre 145 patients ayant subi une rectopexie avec mise en place de matériel prothétique synthétique sans résection et 75 patients ayant subi une résection colique synchrone. Trois matériaux distincts ont été utilisés: des mousses de polyvinyl alcohol (Ivalon) ($n=87$), filet de polyglactine (Vicryl) ($n=09$) et Gore-Tex ($n=26$). Dans le groupe de patients ayant subi une résection colique synchrone, deux infections pelviennes (3,7%) se sont produites après implantation d'Ivalon, une infection abdominale s'est produite après implantation d'un filet de Vicryl et aucune après implantation de Gore-Tex. Dans le collectif sans résection colique, deux patients (3%) ont développé une infection après implantation d'une plaque d'Ivalon alors qu'aucune infection ne s'est produite après implantation d'un filet de Vicryl ou de Gore-Tex. La mortalité totale est de 0.4%. Le follow-up varie de 3 à 120 mois. Trois patients (1.9%) ont développé une récidive du prolapsus sur les 151 porteurs d'un prolapsus rectal complet.

*Correspondence to:* S. Athanasiadis

Abdominal rectopexy with various modifications has been reported to produce excellent results [1–7]. Several means of fixation of the mobilised rectum have been described. These include direct suturing of the rectum to the promontory [3, 8] or the insertion of synthetic material [1, 5–7, 9–11]. In view of the incidence of postoperative constipation, synchronous colonic resection has been increasingly used [1, 3, 8, 12–14]. The combination of resection and insertion of foreign material, however bears a higher risk of infection. In this study, we have compared infection rates after implant rectopexy for prolapse with and without colonic resection. We have also compared the use of three different forms of implant, including Polyvinyl alcohol (Ivalon), Polyglactin (Vicryl) or Gore-Tex. The resection was carried out mainly in patients with existing constipation or a redundant colon. We aimed to determine whether there is a higher risk of infection in patients having a colonic resection and implant rectopexy than in those having rectopexy alone, and whether infection could be related to the type of implant. We also determined the long-term results after different implants.

## Patients (Table 1)

Between January 1985 and December 1994, 269 rectopexies were performed at the Department of Coloproctology at the St Joseph Hospital, Duisburg-Laar. 222 cases (210 females, 12 males) underwent abdominal rectopexy with synthetic implant of polyvinyl alcohol (Ivalon), polyglactin (Vicryl) or Gore-Tex. Of these, 145 had synchronous colonic resection and 77 a rectopexy only. Basic patient data are shown in Table 1. Eight patients were operated on for recurrent prolapse.

From January 1985 to December 1988 data were retrieved retrospectively. Thereafter, data were recorded prospectively. Some of the results, including postoperative function, e.g. constipation or incontinence, have already been reported [1, 14, 18]. Patients were assessed by formal examination in 195 cases or by telephone in 27 cases. The duration of follow-up ranged from 3 to

**Table 1.** Abdominal rectopexy with synthetic implantat ($n=222$)

| | $n$ | Ivalon 87 | Vicryl 109 | Gore-Tex 26 |
|---|---|---|---|---|
| Women : Men | | 85 : 2 | 104 : 5 | 21 : 5 |
| ∅ Age: (29–93 J.) | | 64,6±14 | 61±12 | 63±18 |
| With resection: | 145 | 54 | 84 | 7 |
| Without resection: | 77 | 33 | 25 | 19 |
| *Indication:* | | | | |
| Complete rectal prolapse: | 151 | 63 | 62 | 26 |
| Incompl. rectal prolapse: | 13 | 6 | 7 | – |
| Rectal intussusception: | 20 | 13 | 7 | – |
| Descending perineum syndrom: | 21 | 14 | 7 | – |
| Pelvic floor abnormalities: | 10 | 3 | 7 | – |
| Rectal ulcer syndrom: | 7 | 4 | 3 | – |

120 months. A 5 year follow-up was available in 53% of patients.

## Technique

Posterior rectopexy was performed in 176 patients using the method of Wells with polyvinyl alcohol (Ivalon) [7] or polyglactin implant (Vicryl). Anterior rectopexy according to Ripstein [6] with preservation of the lateral ligaments and polyglactin (Vicryl) or Gore-Tex implant was performed in 46 patients.

Colonic resection when carried out involved an end to end anastomosis at the promontory of the sacrum. All patients received antibiotics, gentamicin and metronidazole or a cephalosporin, for 3 to 5 days postoperatively. A water soluble contrast enema was carried out on the 12th postoperative day.

## Results (Table 2)

There was one death due to heart failure on the 14th day of a 91-year old female. Six patients (3%) developed a wound infection. In the 145 patients having a synchronous colonic resection there were two cases (3.7%) of infection after Ivalon implant, but none after Vicryl implant. One woman who was operated on for recurrent rectal prolapse developed a cutaneous fistula from the abdominal drain site due to anastomotic insufficiency. This required a temporary colostomy which was subsequently closed. There were no postoperative complications in patients having a Gore-Tex implant.

In 77 patients treated by rectopexy only two (3%) developed infection after insertion of polyvinyl alcohol (Ivalon). There were no infections following implantation of polyglactin (Vicryl) or Gore-Tex. Thus, the overall infection rate was 2.0% in the resection group compared with 1.3% in the rectopexy alone group (Table 3). In infected cases, removal of the implant was necessary to resolve the complication.

There were three (1.9%) cases of recurrent prolapse during the period of follow-up out of the 151 patients operated on for complete rectal prolapse. They all occurred after the polyvinyl alcohol (Ivalon) rectopexy and resection.

**Table 2.** Postoperative infection of the implant ($n=222$)
Ivalon v. Vicryl v. Gore-Tex

| | | Infection of the implant |
|---|---|---|
| A. Resection group: | | |
| ($n=145$) | | 3 (2,0%) |
| Ivalon: | 54 | 2 (3,7%) |
| Vicryl: | 84 | 1[a] (1,2%) |
| Gore-Tex: | 7 | / (0%) |
| B. Group without resection: | | |
| ($n=77$) | | 1 (1,3%) |
| Ivalon: | 33 | 1 (3,0%) |
| Vicryl: | 25 | 0 (0%) |
| Gore-Tex: | 19 | / (0%) |
| Total | $n=222$ | 4 (1,8%) |

3,4% 0,9% 0%

[a] Intraabdominal infection with formation of an abscess without evidence of an implant infection

**Table 3.** Recurrent prolapse. Patients operated for complete rectal prolapse ($n=151$)
Ivalon u. Vicryl v. Gore-Tex

| | | Recurrent prolapse |
|---|---|---|
| A. Rectopexy + resection | | |
| ($n=79$) | | 3 (3,7%) |
| Ivalon: | 35 | 1 (2,8%) |
| Vicryl: | 37 | 2 (5,4%) |
| Gore-Tex: | 7 | / (0%) |
| B. Rectopexy alone: | | |
| ($n=72$) | | 0 (0%) |
| Ivalon: | 28 | 0 |
| Vicryl: | 25 | 0 |
| Gore-Tex: | 19 | 0 |
| Total | $n=151$ | 3 (1,9%) |

1,6% 3,2% 0%

## Discussion

Abdominal rectopexy whether by posterior [7] or anterior [6] fixation has been the most commonly used treatment for rectal prolapse. Continence improves in about two thirds of the patients. Infection is a severe complication and has been reported particularly after polyvinyl alcohol (Ivalon) [19–23]. In theory, any foreign implant bears a higher risk of infection.

The reported infection rate after polyvinyl alcohol (Ivalon) implant without resection is between 2 and 16% [2, 5, 19, 20] and after polyfluorine (Teflon) insertion is 1.5–11% [11, 24]. There are no trials comparing different

implant materials regarding infection of recurrence. Furthermore, there is no information as to whether the infection rate might be higher when a synchronous resection is performed. Infection after insertion of absorbable mesh during rectopexy without resection appears to be associated with a zero or very low infection rate [10, 13, 25, 26]. When it occurs, infection of the implant maybe due to an infected pelvic hematoma. In the presence of an anastomosis in those patients having a synchronous resection, the theoretical risk is increased.

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