

Postoperative adhesion prevention in gynecologic surgery with hyaluronic acid

G. Carta, M.D.; L. Cerrone, M.D.; P. Iovenitti, M.D.

Obstetric and Gynecology Clinic, University of L'Aquila, Avezzano Hospital, L'Aquila (Italy)

Summary

Despite improvements in surgical instrumentation and techniques, adhesions continue to form after most procedures. Peritoneal adhesions develop in 60-90% of women who undergo major gynecological operations. This adhesion formation causes significant postoperative morbidity such as bowel obstruction (65%), infertility (15-20%), and chronic pelvic pain (40%).

Objective: To demonstrate the efficacy of a hyaluronic acid product (Hyalobarrier® Gel) for the prevention of adhesions in gynecological surgery.

Materials and Methods: From October 2000 to July 2002, 18 women from 26 to 41 years old (mean age 33.66) underwent myomectomy via laparotomy as their first abdominal operation. Between August 2001 and May 2003, the patients underwent a second-look laparoscopy (7 women, 38.9%, 15 sites, 42.8%) or a second-look laparotomy (11 women, 61.1%, 20 sites, 57.1%) during which all the 35 sites corresponding to the previous myomectomies were analyzed. During the second-look procedure the presence, localization and severity of adhesions were evaluated using the Operative Laparoscopy Study Group Classification (OLSG) and American Fertility Society Classification (AFSC).

Results: All patients underwent a second-look laparoscopy/laparotomy and only five of 18 (27.7%) showed pelvic adhesions in seven sites (20%) of previous myomectomies. No adhesion was found on the previous sites of myomectomies of pedunculated leiomyomas so, excluding those, adhesions were found in seven of 29 sites of myomectomies (24.1%).

Conclusions: The present study emphasizes the need for improved treatments to prevent adhesions, as there is no doubt that adhesions represent one of the major causes of female morbidity.

Key words: Hyalobarrier® Gel; Adhesion; Myomectomy; Second-look procedures.

Introduction

Despite improvements in surgical instrumentation and techniques, adhesions continue to form after most procedures. Peritoneal adhesions develop in 60-90% of women who undergo major gynecological operations. This adhesion formation causes significant postoperative morbidity such as bowel obstruction (65%) infertility (15-20%) and chronic pelvic pain (40%) [1].

In 1988 the American Fertility Society proposed a classification of adhesions considering the type (filmy or dense) and involvement of the ovary or fallopian tube (0 to 32 points) [2, 3].

In 1995 the Adhesion Scoring Group (OLSG, Operative Laparoscopy Study Group) published another pelvic adhesion classification considering the severity and the extension of adhesions in terms of percentage of involved surfaces (anterior and posterior) of the uterus, Douglas' pouch, ovarian tissue, fallopian tubes, intestinal surfaces and omentum. The scoring included a grade 0 (absence of adhesions), grade 1 (filmy and avascular adhesions), grade 2 (dense and/or vascular adhesions) and grade 3 (cohesive adhesions) [4]. As far as the extension is concerned, patients were scored as grade 0 (absence of adhesions), grade 1 (thin or narrow, easily separable adhesions), grade 2 (thick adhesions limited to one area), grade 3 (thick and widespread adhesions), and grade 4 (thick and

widespread adhesions, plus adhesions of viscera to the anterior and/or posterior abdominal wall) [5].

Strategies of adhesion prevention involve the use of minimally invasive surgery such as the laparoscopy technique, minimizing trauma due to overheated irrigating solutions, the employment of cautery, lasers and retractors as sparingly as possible, minimizing ischemia, the avoidance of dry sponges (tissue has to always be moist), the use of fine, nonreactive sutures, or the introduction of barrier substances which reduce the contact of surfaces during the process of postoperative healing [6-13].

The present study attempted to demonstrate the efficacy of a Hyaluronic acid product (Hyalobarrier®, Gel) for the prevention of adhesions following gynecological surgery.

Materials and Methods

Hyalobarrier® Gel represents a "selective barrier" on tissues, admitting only water and small molecules [14]. It is entirely composed of a derivate of hyaluronic acid called ACP (auto cross-linked polymers) [15]; Hyalobarrier® Gel is nontoxic, non-immunogenic and biocompatible and goes to spontaneous degradation and absorption after seven days from its use. Hyalobarrier® Gel protects traumatized tissues for up to seven days after surgery, thus, preventing, healing adhesions [13].

From October 2000 to July 2002, 18 women from 26 to 41 years old (mean age 33.66) underwent laparotomic myomectomy as their first abdominal operation. The technique was standard, and Hyalobarrier® Gel was introduced in all patients

before the reconstruction of the abdominal wall. During each operation information was collected about number, diameter and type of removed leiomyomata, type of suture (single or double layer, single stitches or continuous suture), presence of pelvic adhesions or endometriosis. None of the patients had adhesions or endometriosis.

Indications for myomectomy were infertility in 13 patients (72.2%), menorrhagia-metrorrhagia in four cases (22.2%) and chronic pelvic pain in only one patient (5.5%).

Between August 2001 and May 2003, these 18 women underwent a second-look laparoscopy (7 patients, 38.9%, 15 sites, 42.8%) or a second-look laparotomy (11 patients, 61.1%, 20 sites, 57.1%) during which all the 35 sites corresponding to the previous myomectomies were analyzed.

In seven patients the second-look procedure was performed during a cesarean section.

Indications for the second-look were systematic control for infertility (6 cases, 33.3%), cesarean section (7 cases, 38.9%), recurrent leiomyomas (3 cases, 16.6%) and ectopic pregnancy (2 cases, 11.1%).

During the second-look the presence, localization and severity of adhesions were evaluated using the OLSG and the AFSC.

Results

Mean diameter of removed leiomyoma uteri was 65.8 mm (range from 50 to 100 mm) among the 18 patients operated on. Mean number of leiomyomas removed in each patient was two (range from 1 to 4).

Among the 35 leiomyomas removed, 21 were intramural (60%), eight were subserosal and sessile (22.8%), and six were pedunculated subserosal (17.2%). In 16 (45.7%) cases leiomyomas involved the anterior wall of the uterus (12 were intramural and 4 were pedunculated subserosal), in 19 (54.3%) cases they involved the posterior wall (13 were intramural, 5 were subserosal and sessile and only 1 was pedunculated subserosal). In 25 (71.4%) cases a double layer suture of the uterus was practiced, while in ten (28.6%) cases a single layer suture was performed (Table 1).

All patients underwent a second-look laparoscopy/laparotomy, and only five of 18 (27.7%) women showed pelvic adhesions in seven sites out of 35 (20%) of previous myomectomies. No adhesion was found on previous myomectomy sites of pedunculated leiomyomas so, excluding those, adhesions were found in seven of 29 myomectomy sites (24.1%) (Tables 2, 3).

Adhesion severity (OLSG Classification) was grade 1 for one case (5.5%) and grade 2 for three cases (16.6%). No patient showed grade 3 adhesions. Pelvic/abdominal organs involved in the new adhesions were the small intestine in one patient (5.5%) and intestine, bladder and pelvic serosa in three patients (11.1%). According to the AFSC, during the second-look only one of 18 patients (5.5%) was found with minimal (filmy) unilateral fallopian tube adhesions.

Discussion

Pelvic adhesion development after gynecological operations and the reformation after adhesiolysis still repre-

Table 1. — *Characteristics of removed leiomyomas uteri.*

Leiomyomas	Intramural	Subserosal/ Sessile	Pedunculated subserosal	Total
Anterior wall	12	0	4	16
Posterior wall	13	5	1	19
Total	25	5	5	35

Table 2. — *New adhesions found during the second-look procedure in previous myomectomy sites.*

Type of myoma	Sites of adhesions	Total %	Sites of myomectomies	Total %
Intramural	6/25	24	25	71.4
Sessile	1/5	20	5	14.3
Pedunculated	0	0	5	14.3
Total	7/35	20	35	100

Table 3. — *Second-look after laparotomic myomectomy.*

No. of patients	No. of sites	Total no. of patients with adhesions	Sites of adhesions	Patients with adnexal adhesions
18	35	5/18 (27.7%)	7/35 (20%)	1/18 (5.5%)

sent a problem in terms of infertility, pelvic pain and/or intestinal obstruction [16].

A realistic current goal for surgeons is to reduce and prevent the formation of adhesions, especially in clinically important areas such as the small bowel, uterus and adnexa. The two main strategies for adhesion prevention or reduction are adjusting surgical practice and applying adjuvants [17].

The result of this study is encouraging in that the risk of adhesions after myomectomy via laparotomy appears to be lower with the use of Hyalobarrier® Gel.

Indeed, laparotomy is more invasive and traumatizing than the laparoscopy technique, which avoids intraperitoneal contamination and desiccation, and uses fine instruments and gentle handling of tissues; nevertheless adhesion reformation also occurs after laparoscopy in a percentage varying from 10 to 40% [18]. Some authors affirm that the incidence of reformed adhesions with laparoscopy is the same as with laparotomy, especially in the same site of previous myomectomies and in particular if the site is on the posterior uterine wall [4].

The present study emphasizes the need for improved treatments to prevent adhesions, as there is no doubt that adhesions represent one of the major causes of female morbidity.

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Address reprint requests to:
 G. CARTA, M.D.
 Università di L'Aquila
 Dipartimento di Scienze Chirurgiche
 Facoltà di Medicina e Chirurgia
 Via Vetoio, Pal 11/A
 67100 L'Aquila (Italy)