

An evaluation of laparoscopic adhesiolysis in patients with chronic abdominal pain

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Received: 5 January 1994/Accepted: 6 February 1995

Abstract. The purpose of this prospective study was to determine whether laparoscopic adhesiolysis ameliorates chronic abdominal pain in patients with abdominal adhesions. Forty-five patients with chronic abdominal pain lasting for more than 6 months but with no abnormal findings other than adhesions found at laparoscopy underwent laparoscopic adhesiolysis. Thirty-six patients (80%) were available for follow-up after a median time interval of 10 months (range: 6–36 months). Seventeen patients (47.2%) were free from abdominal pain and 13 patients (36.1%) reported significant amelioration of their pain. Six (16.6%) patients had no amelioration. Twenty-nine patients (80.6%) judged the outcome of the operation to be good or beneficial and 35 (97.2%) said that they would undergo the operation a second time if that were necessary. Laparoscopy is an effective tool for the evaluation of patients with chronic abdominal pain, and laparoscopic adhesiolysis cures or ameliorates chronic abdominal pain in more than 80% of patients.

Key words: Chronic abdominal pain — Laparoscopic adhesiolysis

Adhesions have been suggested as a possible cause of chronic abdominal pain but the reports of their etiological role conflict [6, 12]. Lysis of adhesions has been proposed as the therapeutic modality of choice although the reports of success are controversial [10].

Laparoscopy is an effective tool in the evaluation of chronic abdominal pain in selected patients who give a history of abdominal pain lasting for more than 6 months [6]. Furthermore, laparoscopic surgery is very effective in reducing intraperitoneal adhesions

and causes no de novo adhesions comparable to those that may occur after laparotomy [1, 7, 8, 9].

This study was designed to determine whether laparoscopic adhesiolysis improved the complaints of patients with chronic pain in the lower, middle, and upper abdomen.

Patients and methods

Among 1,200 patients operated on laparoscopically between May 1989 and March 1993, 51 patients who underwent laparoscopic adhesiolysis for chronic abdominal pain were studied prospectively. The patients, 39 women and 12 men, ranged in age from 18 to 79 years with a median age of 45 years. All the patients underwent elective diagnostic laparoscopy for the evaluation of their chronic abdominal pain. Those patients whose only abnormal findings at laparoscopy were significant adhesions affecting the large or small intestines were included in the present study. Thirty-three patients were treated in the surgical department of the hospital at Aarberg and 18 in the gynecologic department of the hospital at Biel. One author, at least, was present during each operation. The following exclusion criteria were used: a suspicion of malignant disease, cholelithiasis, an ovarian cyst, abnormal findings at pelvic examination or at preoperative sonography suggestive of pathology that could be the cause of the pain, endometriosis, pregnancy or ectopic pregnancy, and mental retardation. Patients with such conditions were excluded either preoperatively or at the time of laparoscopy.

To obtain an exact history of each patient's pain, each patient was required to answer preoperatively a standardized questionnaire that included questions about the duration of the pain in months, previous laparotomy or pelvic inflammatory disease, prior medical investigations, the exact symptoms and localization of the pain, and any events associated with an increase or decrease in the pain. The patients were admitted to the study only if they had had abdominal pain for at least 6 months. In our study the duration of the pain ranged from 6 months to 17 years with a median duration of 2.0 years.

The number of previous laparotomies per patient ranged from zero to eight with a median of 2.0. Appendectomy ($n = 29$), hysterectomy ($n = 19$), and other gynecologic procedures ($n = 44$) were the most frequent operations in the patient's past histories. Other prior abdominal operations were cholecystectomy ($n = 8$), operations for adhesions ileus ($n = 6$), "open" adhesiolysis ($n = 5$), operations on the stomach ($n = 2$), and hemicolectomy ($n = 2$). Two women who had no previous operations had histories of pelvic

inflammatory disease. Prior to laparoscopy most of the patients had undergone extensive preoperative medical investigations to determine the cause of their discomfort: 49 patients had had an ultrasound examination, 28 an abdominal x-ray, 32 a colonoscopy, 16 a contrast swallow or enema, and 8 computed tomography. The median number of these preoperative tests was 3.0.

All of the patients had a high enema preoperatively and those in whom extensive adhesions were suspected an additional nutrient enema. In order to relate each patient's localization of pain with the intraoperative findings, the main localization of the pain was marked on the skin preoperatively with waterproof ink. The patients underwent elective diagnostic laparoscopy under general anesthesia.

In five patients in whom extensive adhesions were suspected an "open laparoscopy" was done. In the other 46 patients the Veress needle was passed through the abdominal wall in the left upper quadrant of the abdomen a few centimeters below the ribs. It is known that adhesions are rare at this site (Palmer's point) [13]. After meticulous palpation of the umbilical area with the Veress needle to make sure that there were no adhesions at the proposed incision site, the laparoscopic trocar was introduced through a 1-cm incision. Additional punctures were made for the instruments needed to hold and manipulate the intraabdominal organs so that the adhesions could be appropriately dissected. The abdominal cavity was divided into four areas (lower and upper quadrant on each side) to localize the adhesions.

The adhesions were graded according to a standardized score of I-III: a score of I (mild) indicated thin and avascular lesions; II (moderate) indicated thick and avascular lesions; and III (severe) indicated very dense and vascular adhesions [2, 7, 9]. To calculate the density score only the most dense adhesions were scored.

The adhesions were stretched and then immediately dissected or divided after coagulation with bipolar cautery or ligation, as described elsewhere [4]. Complete hemostasis was always achieved. Approximately 500 ml of Ringer's lactate solution was left in the abdominal cavity after each procedure. Prophylaxis with a gastric motility stimulant (cisapride, Propulsid®) was begun after the operation and continued for 3 weeks. In patients with extensive adhesions antibiotic prophylaxis was given for 48 h.

The postoperative course was recorded using the following criteria: the first bowel movements and feeding, the dosage of analgesics needed, wound healing, and the duration of hospitalization.

The postoperative outcome was assessed with a standardized questionnaire completed at least 6 months postoperatively.

Results

There were no complaints in the past histories of the patients that could be regarded as pathognomic of adhesions although most of the patients ($n = 31$) complained of cramping pain. Others descriptors for the pain were: pressing ($n = 18$), stinging ($n = 14$), tugging ($n = 14$), and burning ($n = 6$). An increase in the pain was associated with movement ($n = 33$), night time ($n = 18$) and occurrence after meals ($n = 14$). Constipation ($n = 19$) was often mentioned as a concomitant symptom, as were eructation ($n = 18$), meteorism ($n = 11$), and vomiting ($n = 8$).

All of the patients had adhesions of at least grade I or II and 30 had adhesions of grade III. The mean adhesions density score at laparoscopy was 2.6 ± 0.6 , which showed that overall our patients had severe adhesions.

Table 1 shows the correlation between the main localizations given in the histories of pain and the laparoscopic findings.

The operative procedure and postoperative follow-up are summarized in Table 2. Minor bowel injuries occurred in six patients (11.8%) who had extensive adhesions. All six were repaired by laparoscopic su-

Table 1. Correlation between the main localizations of complaints given in the histories of pain and the laparoscopic findings

	Localization of pain in history	Intraoperative findings
Right lower abdomen	29	35
Right upper abdomen	5	17
Left lower abdomen	22	23
Left upper abdomen	6	8

Table 2. Operation, postoperative outcome

Operation	Mean \pm SD	
Trocar punctures		3.3 ± 0.6
Adhesion score	I	45
	II	45
	III	30
Operation time in min	Mean \pm SD	78.2 ± 33.2
Complications	Bleeding	0
	Bowel injury	6
	Laparotomy	2
Postoperative outcome		
Flatus	Mean \pm SD	0.8 ± 0.7 days
Stools	Mean \pm SD	1.9 ± 1.3 days
Tea		0.1 ± 0.3 days
Normal nutrition		1.0 ± 0.3 days
Urinary tract infections		0

ture. Two patients (3.9%) required a laparotomy: one because of a severe bowel injury and the presence of extensive adhesions which prevented an adequate overview of the lesion. The second laparotomy was done in a woman with adhesions that were so extensive and grotesque that a laparotomy was essential.

One patient died due to persistent ileus 2 months after the procedure. This patient had had a hemicolectomy for a colon carcinoma 2 years previously and since that time had had recurrent subileus. After excluding a local recurrence of the tumor we decided to perform a laparoscopic adhesiolysis. After the operation the patient developed intestinal obstruction. The patient refused a second operation because he was aware that he had liver metastases.

There were no other postoperative complications. Bowel movements began early (flatus after 0.8 ± 0.7 day, stools after 1.9 ± 1.3 days). Most of the patients were able to eat normally on the 1st postoperative day.

Of the initial 51 patients who underwent laparoscopy for chronic abdominal pain six were excluded from the study: two women with florid endometriosis that was found at the time of laparoscopy, one patient with a Meckel's diverticulum removed by laparoscopy, the two patients who had a laparotomy, and the patient who died postoperatively.

Of the other 45 patients, 36 patients (80%) were available for follow-up at a median time interval of 10 months (range 6-36 months). Seventeen patients (47.2%) were free from abdominal pain; 11 patients (36.1%) reported a significant amelioration of their pain although they still had a few—but not really disturbing—complaints. Six (16.6%) patients had no amelioration. Twenty-nine patients (80.6%) judged the out-

come of the operation to be good or beneficial and 35 (97.2%) said that they would undergo the operation a second time if that were necessary.

Discussion

The patients in our study had all had chronic abdominal pain for several years with a median period of 2 years before they underwent laparoscopic adhesiolysis. Their histories of pain did not reveal a typical form of pain characteristic of the condition. All of the patients had had a pelvic inflammatory disease or at least one laparotomy in their past histories. As reported previously, appendectomy and gynecologic procedures were the most frequent prior operations. From previous studies it is known that laparotomy is followed in 70–86% of patients by the development of adhesions [11, 13].

The significance of adhesions as a cause of chronic abdominal pain is still a subject of controversy in the literature [6, 12]. It is not therefore surprising that the patient's previous histories recorded ineffective searches for somatic disease entailing visits to many different consultants and expensive clinical investigations. The fruitless outcome of these investigations had often ended in puzzling diagnoses such as "irritable bowel syndrome," "pelvic pain syndrome," or "pain of psychogenic origin."

In this study all of the patients with chronic abdominal pain had adhesions as the only abnormal finding at laparoscopy. This clearly shows that laparoscopy is required before the pain is attributed to an emotional or psychosomatic cause. According to the standardized score of I–III [2, 7, 9] the mean adhesion score of 2.6 ± 0.6 shows that the patients included in this study had severe adhesions. As shown in Table 1 it was possible to see an important correlation between the pain localizations as described in the pain histories and preoperatively marked on each patient's skin and the intraoperative findings. The table also shows that there were more abdominal adhesions at the time of laparoscopy than were indicated by the pain localizations. These findings agree with the accepted belief that not all abdominal adhesions cause pain. Kresch theorized that adhesions that restrict or cause limitation of movement or limitation of distensibility of one or more organs, in particular those organs involving the parietal peritoneum or bowel, are more likely to cause pain than adhesions involving other sites [6]. In our study the pain localization described in the pain histories and marked on the skin corresponded with restricted bowel segments. We thus agree with the remarks of Kresch [6].

In laparoscopic procedures the peritoneal organs are not exposed to the atmosphere. This reduces the consequent potential for infection, for drying of the peritoneal surfaces responsible for tissue ischemia, and for the possible intraperitoneal introduction of foreign bodies. Previous studies have shown that lysis at laparoscopy is better than lysis at laparotomy and that

there is less de novo adhesion formation after laparoscopic adhesiolysis [1, 7, 9]. Kolmorgen and Mecke showed that the lysis of pelvic adhesions is a useful procedure in patients with chronic pelvic pain [5, 8]. Our study shows that the procedure is also an effective tool in more than 80% of patients with chronic abdominal pain involving small- and large-bowel adhesions. This result was obtained in a follow-up after a mean period of 10 months. Furthermore, as others have reported, for the few patients who had a negative outcome the exclusion of significant disease was beneficial not only for "peace of mind" but also for the avoidance of further uncomfortable and costly investigations [3].

In conclusion, this study showed that patients with chronic abdominal pain lasting for more than 6 months and who have had a laparotomy or a pelvic inflammatory disease in their past histories should undergo diagnostic laparoscopy. The procedure is an effective and safe tool for the evaluation of abdominal pathology. It achieves a cure or amelioration of the pain in the majority of the patients with adhesions and avoids a major laparotomy.

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