

LAPAROSCOPIC MANAGEMENT OF POST APPENDECTOMY RIGHT ILIAC FOSSA PAIN

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استخدام منظار البطن الجراحي في معالجة الآلام التي تحدث بالمنطقة الحرقفية اليمنى
بالبطن بعد عملية استئصال الزائدة الدودية

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قسم الجراحة العامة- مستشفى اسيوط الجامعي-جامعة اسيوط

اجريت هذه الدراسة على ١٩ مريضا ١٢ من الاناث و٧ من الذكور تتراوح اعمارهم بين ١٨ و ٤٣ سنة بمتوسط ٣٠،٢٨ سنة . هؤلاء المرضى يعانون من الام بالمنطقة الحرقفية اليمنى بالبطن بعد اجراء عملية استئصال الزائدة الدودية لهم بفترة زمنية تتراوح بين ١٤،٤ شهرا . وخمسة منهم يعانون من الام بالحوض ايضا. تم اخذ تاريخ المرضى من كل منهم وفحصه اكلينيكيًا مع عمل كل الفحوصات الاتية

١-تحليل بول وبراز.

٢-اشعة تلفزيونية على البطن والحوض.

٣-اشعة بالباريوم على الامعاء الرفيعة والقولون

تم عمل منظار جراحي تشخيصي على البطن لهؤلاء المرضى ووجد ان الالتصاقات سببا لهذه الآلام تم فحص هذه الالتصاقات في ١٨ منهم بواسطة المنظار وكانت المضاعفات التي حدثت هي فتح القولون في مريض واحد والمثانة البولية في اخر (١١،١%) اما في الحالة الباقية ، فتم فضها من خلال اجراء عملية استكشاف لها وذلك لصعوبة الالتصاقات مع وجود كيس على المبيض الايمن وسطها.

تم متابعة ٥،٨٩% من المرضى لمدة تتراوح بين ٩ و ١٢ شهرا ومع ذلك لم يحدث اى ارتجاع لهذه الآلام ولاى من المرضى احتاج الى اى من المسكنات . من هنا فان علاج هذه النوعية من الآلام بواسطة منظار البطن الجراحي هي الطريقة المفضلة.

SUMMARY

Appendectomy is the most common general surgical operation. Eighty percent of these operations are proved to cause some sort of intra-abdominal adhesions that could be symptomatic. In this study, we aimed at assessment of laparoscopic diagnosis and treatment of post appendectomy abdominal pain (PAAP).

This study was performed on patients with PAAP, who presented to the Department of Surgery of Assiut University Hospital in the period between January 2000 and January 2002. After clinical and investigatory assessment, only patients with no evident cause of pain were included. Diagnostic laparoscopy was done to all patients with adhesiolysis if needed.

Nineteen patients, 12 females and 7 males, were included, with a mean age of 28.3 years. All patients presented with unremitting PAAP. The period between appendectomy and presentation ranged from 4 to 14 months. Postoperative adhesions were found to be the main cause of pain in 18 patients. One patient had normal laparoscopic finding. Laparoscopic adhesiolysis was completed in 17 patients. In the remaining case conversion to open adhesiolysis was needed. Inadvertent injury of the caecum occurred in one patient and the bladder in another (11.1%), both of which were

repaired laparoscopically. After a mean follow up period of 10.8 months, marked improvement of symptoms was noticed using visual analogue pain scale assessment. In conclusion, laparoscopy could be considered as an effective tool for management of patients with PAAP secondary to adhesions.

Key words: appendectomy, pain, adhesions, laparoscopy, diagnostic, adhesiolysis.

INTRODUCTION

Postoperative intra-abdominal adhesions are major concern in modern surgery (Van der Kraghen et al, 2000). Chronic abdominal pain and pelvic pain are frequently cited as adhesion-related problems (Herslag, 1991 and De Chrney and diZerega, 1997). Open appendectomy is a main cause of intra-abdominal adhesions (Raf, 1969 and Coleman and Moran, 1999). In a randomized study in cases with acute appendicitis treated by open appendectomy, 80% of them had adhesions between the bowel, omentum and abdominal wall at second look laparoscopy 3 months later (De Wiled, 1991). When adhesions become clinically symptomatic, adhesiolysis is indicated. Some authors considered laparoscopy to be the method of choice for elective division of abdominal and pelvic adhesions (Coleman and Moran, 1999 and Al-Musawi and Thompson, 2001). Its role has been documented in the management of chronic pelvic pain and small bowel obstruction (Navaratham et al, 1998).

We aimed at assessment of the role of laparoscopy in diagnosis and management of post appendectomy abdominal pain (PAAP).

PATIENTS AND METHODS

This study was conducted on the patients who were presented to the Department of Surgery, Assiut University Hospital, in the period between January 2000 and January 2002, complaining of unremitting PAAP after undergoing conventional open appendectomy. Patient files were reviewed to collect data regarding operation date and operative time.

All patients were subjected complete clinical assessment and investigations including urine and stool analysis, ultrasonography and contrast studies if needed. Only those patients without evident causes of PAAP were included. Pain was assessed by visual analogue pain scale (Scott and Huchisson, 1976), asking the patient to make a mark appropriate to the pain on a linear 10 cm scale, where 0 represents no pain and 10 is agony.

All patients were subjected to laparoscopic diagnosis combined with adhesiolysis if needed. Conversion to open surgery was resorted to on demand. Laparoscopy was performed under general anesthesia. Using CO2 insufflation, one to three trocars were introduced according to the need. The first trocar was introduced away from the site of the incision, and if in doubt an open 'Hasson' technique was used. Other trocars were introduced under direct vision. Assessment of the abdominal cavity with special concern to any

adhesions was performed, especially in the right and lower abdomen. These adhesions were staged according to Peter et al (1992) as follows:

Stage I: Some filmy non-vascularised adhesions, and easy to be released during laparoscopy.

Stage II: Extensive filmy non-vascularised adhesions involving one or more of intra-abdominal organs (uterus, adnexa, small bowel, colon, bladder), mesentery, mesocolon or omentum.

Stage III: Numerous, partly vascularised adhesions involving one or more of intra-abdominal organs.

Stage IV: As for III but with dense vascularised adhesions involving the serosa of the small bowel or colon fixed to the parietal peritoneum.

When adhesions were encountered, adhesiolysis was done. The adhesions were divided until the caecum, omentum and terminal ileum became free from the abdominal wall and pelvic organs. Intra-operative complications and their management were recorded.

We followed the patients up at one, 3, 9 and 12 months postoperatively. Pain was reassessed by visual analogue pain scale.

The data were statistically analyzed using one way analysis of variance with a linear contrast, X test with trends and the Kruskal Wallis test as appropriate. P value less than 0.05 was considered significant.

The research protocol was approved by the "Ethics Committee" of Assiut Faculty of Medicine.

RESULTS

This study included 19 patients, 12 females (63 %) and 7 males (37%). The age ranged from 18 to 43 years with a mean age of 28.3 years. All patients complained of unremitting PAAP in the right iliac region associated in 5 of them with pelvic pain. The period of time between appendectomy and presentation ranged from 4 to 14 months with mean 8.1 months. From the reviewed files, it appeared that 11 patients had localized peritonitis and 7 had lengthy operations of more than 90 minutes (Table 1).

Laparoscopy revealed that 18 patients (94.7%) had postoperative adhesions, while one patient (5.3%) had no adhesions or other abnormalities. According to the stage of adhesions, the patients were categorized into: (see Table 2)

Group A: with stage IV adhesions included 8 patients (42.1%). The omentum with the ileum and/or caecum were found to be firmly adherent to the anterior abdominal wall at the site of the incision (Figure 1-A). Successful adhesiolysis was done (Figure 1-B). However, inadvertent injury of the caecum in one patient occurred and was repaired laparoscopically by suturing with peritoneal drainage and uneventful postoperative course.

Group B: with stage III adhesions included 7 patients (36.8%). Different organs were incorporated, including omentum, ileum, bladder and adnexa (Figure 2-A). Laparoscopic

adhesiolysis was completed successfully in 7 patients (Figure 2-B). One of them had injury to the urinary bladder that was repaired laparoscopically by suturing with insertion of self retaining urinary catheter (Figure 3-A, 3-B, 3-C, 3-D). In one patient, however, we encountered a 5 cm cyst in the right ovary, which was amalgamated with the terminal ileum and omentum by extensive adhesions (Figure 4-A, 4-B), so that conversion to open adhesiolysis was mandatory, where ovarian cystectomy was also done.

Group C: with stage II adhesions included 3 patients (15.8%). They suffered filmy non-vascularized adhesions incorporating the omentum, intestinal loops (Figure 5-A). Adhesiolysis was performed successfully (Figure 5-B).

Group D: with no adhesions included one patient (5.3 %). She had no other abnormal findings.

Many organs were incorporated in the postoperative adhesions, namely omentum in all 18 cases, abdominal wall in 17, ileum in 12, caecum in 6 and pelvic organs (bladder, uterus and adnexa) in 7 cases (Table 3).

All patients were discharged within the first 48 hours except those patients with caecal injury, bladder injury and conversion to open surgery, who were discharged after 10, 7 and 5 days respectively. Seventeen patients (89.5 %) attended the follow up for 9 to 12 months with a mean period 10.9 months. In those patient pain improved significantly with no analgesic requirement according to the visual analogue pain scale. Preoperative values ranged from 7 to 10 with a mean of 8.53, whether postoperative values ranged from 0 to 4 with a mean value of 0.89 ($P = 0.003$) (Diagram 1). Unfortunately, the patient with negative diagnostic laparoscopy did not attend the follow up visits.

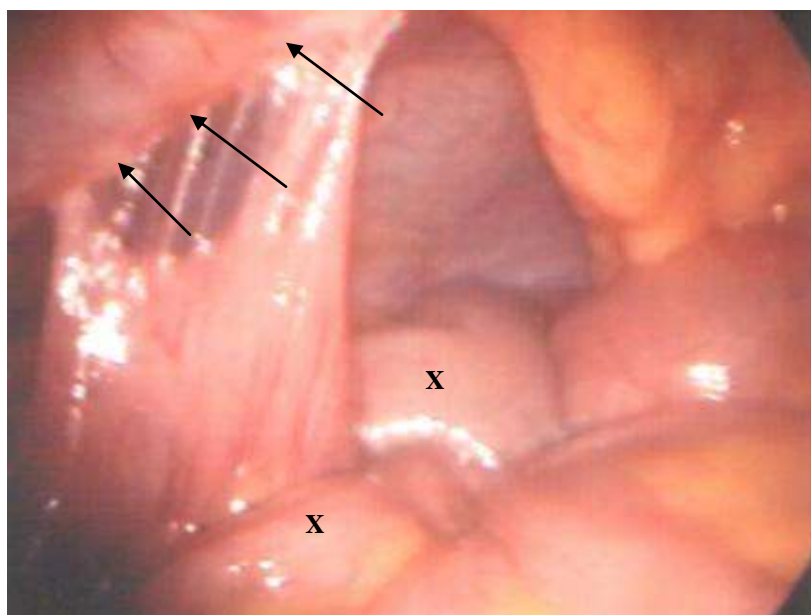


Figure 1-A: Stage IV adhesions between the terminal ileum and caecum (xx) on one side and the parietal peritoneum on the other side (arrows).

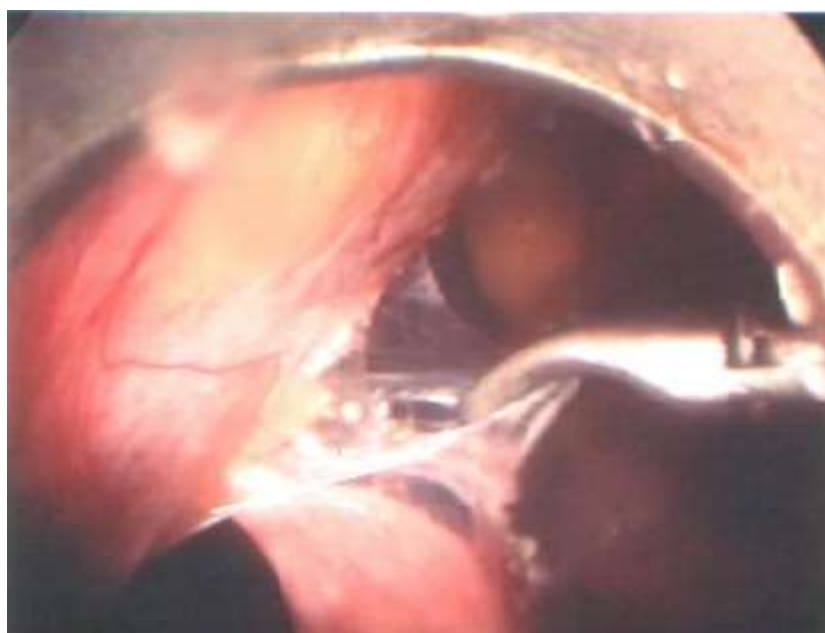


Figure 1-B: Adhesionolysis of the above adhesions.



Figure 2-A: Stage IV adhesions between terminal ileum, omentum and the parietal peritoneum.



Figure 2-B: Adhesiolysis of the above adhesions.

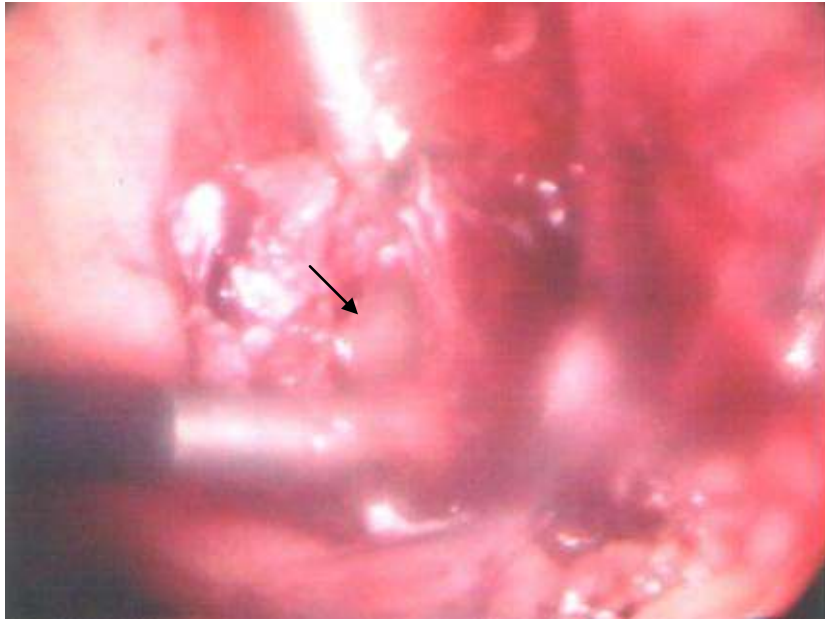


Figure 3-A: Urinary bladder injury (arrow)during adhesiolysis of stage III adhesions.

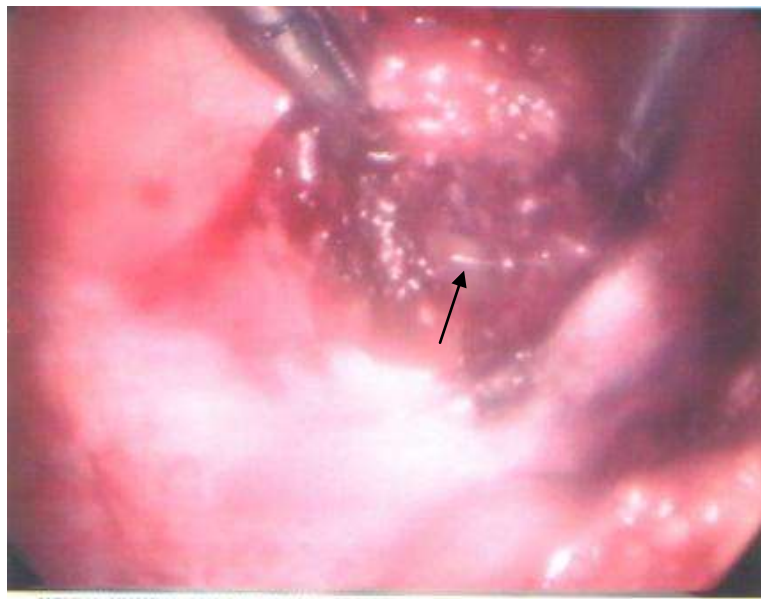


Figure 3-B: Laparoscopic suture repair of the bladder tear. The needle appears passing through one edge of the tear (arrow).

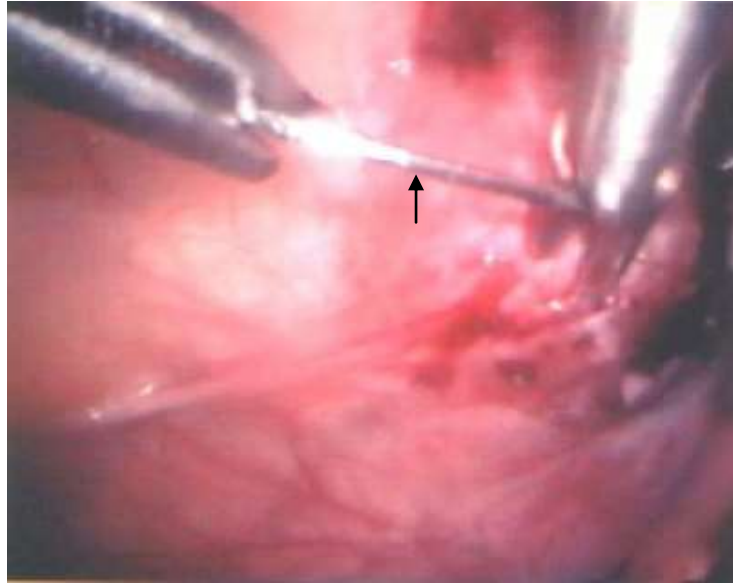


Figure 3-C: Laparoscopic suture repair of the bladder tear. The needle is pulled through the other edge of the tear (arrow).



Figure 3-D: Testing of the bladder repair by its filling with saline solution via a urethral catheter. No leakage was seen.

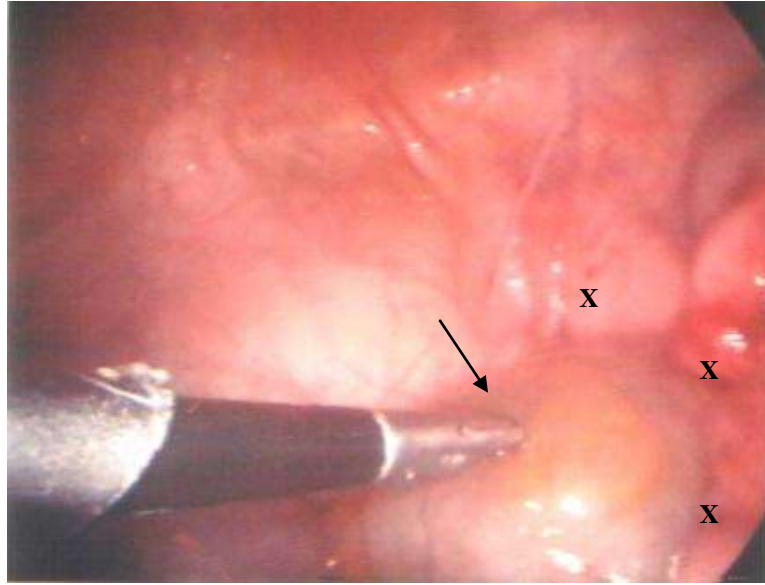


Figure 4-A: Right ovarian cyst (arrow) amalgamated with the terminal ileum and omentum (XXX) by stage III adhesions..

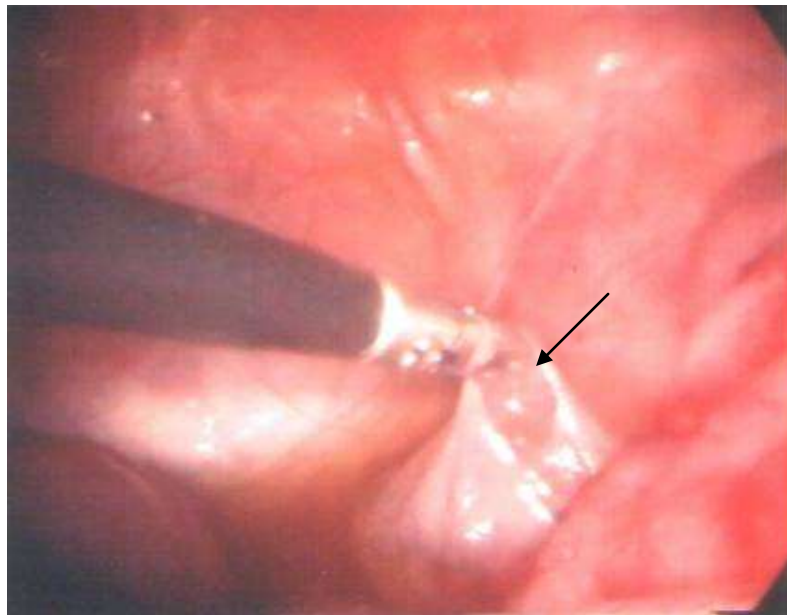


Figure 4-B: Inadvertent opening of the cyst (arrow) occurred during a trial of laparoscopic adhesiolysis. Open adhesiolysis and ovarian cystectomy were done.

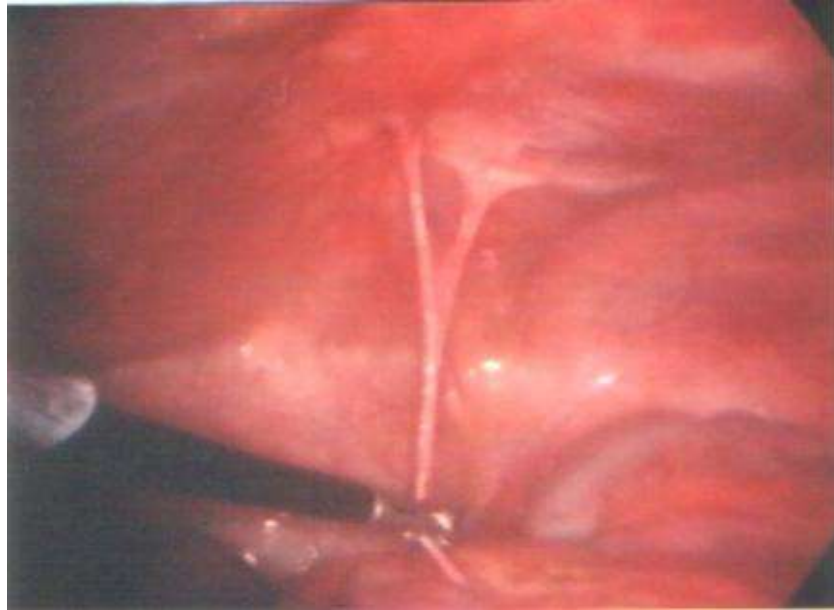


Figure 5-A: Stage IV adhesion, a band between the parietal peritoneum and the intestine.

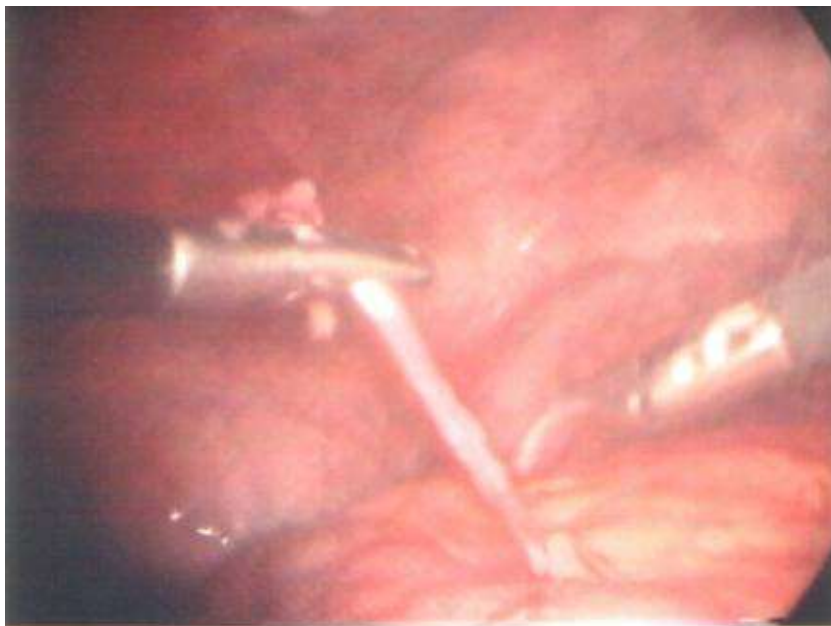


Figure 5-B: Laparoscopic division of the above band.

DISCUSSION

Appendectomy is one of the commonest causes of intra-abdominal adhesions (Coleman and Moran, 1999). Laparotomy causes operative trauma and serous exudate forms as a result of inflammatory response, with subsequent deposition of fibrin within 3 hours. If fibrinolysis is not complete within 72 hours, collagenous organization and capillary proliferation begins by the third day producing permanent adhesions (Holmdahl, 1999 and Ivarsson et al., 2001). In addition, suturing of the peritoneum in laparotomy incision increases the incidence of adhesions (Coleman and Moran, 1999).

In current practice, laparoscopy is replacing laparotomy as the method of choice for elective division of pelvic and abdominal adhesions. It is associated with less peritoneal injury, de novo and incisional adhesion formation and has the other advantages of minimally invasive procedures (Al-Musawi and Thompson, 2001). The incidence of adhesions after appendectomy is more in presence of peritonitis and when the appendix necessitated a wider exploration that damage the peritoneal lining (Anderson, 2001). The increased incidence of adhesions after prolonged operations was found to be due to the decrease in the fibrinolytic capacity with time during laparotomy (Scott-Coombes et al., 1996 and Holmdahl et al., 1996). This is a result of reduced level of tissue-type plasminogen activator, which is the main peritoneal fibrinolytic stimulator (Holmdahl et al., 1998) and also due to increased inhibition by plasminogen activator inhibitor type I (Ivarsson et al., 1998).

Adhesions were extensive in most of our patients (type III and IV in 15 Out of 19 patients, 78.9%). Post-operatively, the symptoms were significantly improved on visual analogue pain scale assessment with no analgesic requirements recorded after a mean period of follow up 10.9 months of 89.5% of patients. This was also reported by Navaratham et al., 1998. This is also consistent with the findings of Peter et al., 1992, who reported that significant reduction in pain occurred in patients with severe and dense adhesions involving the small bowel and to lesser extent the colon. They postulated that those patients will benefit from adhesiolysis.

No recurrence of symptoms occurred in patients who attended the follow up (89.5%) for a mean period 10.9 months, an observation that suggests that no significant adhesions occurred after laparoscopic adhesiolysis. This was previously proved by animal and clinical studies (Marana et al., 1994, Bulletti et al., 1996 and Lundorff et al., 1998). The possible factors for decreasing adhesion post-laparoscopy are meticulous technique with good haemostasis, liberal irrigation and use of fine electrodes. Also gauze swabs, retractors and foreign bodies such as lint and talcum powder are not used in laparoscopic surgery. Prolonged peritoneal exposure to air which occurs during open laparotomy with subsequent mesothelial desiccation contributes to de novo adhesion formation at sites remote from operative site. This room air desiccation does not occur in laparoscopic surgery. So that, laparoscopic adhesiolysis should be more appropriate than open adhesiolysis (Coleman and Moran, 1999). Moreover, the incidence of incisional adhesions is

less with laparoscopic surgery (Reissman et al., 1996).

Inadvertent enterotomy is a known drawback of reoperative abdominal surgery directly related to adhesions (Van der Krabben et al., 2000). It has also been reported to be as the main complication of laparoscopic surgery (Lervant et al., 1997 and Oliveira et al., 1997). Inadvertent injury of the caecum and the urinary bladder occurred in 11.1% of our patients during adhesiolysis of dense adhesions in the pelvis. Van der Krabben et al, 2000, reported that over 50% of inadvertent injuries occurred when adhesiolysis was carried out in the lower abdomen and pelvis. They also reported enterotomy in 19 % of their series.

In our series, conversion to laparotomy was indicated in a female patient with right ovarian cyst, not discovered by ultrasonography, because it was amalgamated with the terminal ileum and omentum by extensive adhesions.

In conclusion, the concept of diagnostic laparoscopy and therapeutic adhesiolysis is attractive and offers all the advantages of minimally invasive surgery. The success encountered in this study suggested that this should be the tool of choice for the management of patients with post-appendectomy pain secondary to intra-abdominal adhesions.

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Table (1): Preoperative data of our patients:

total	female	male	age	time since append.	previous appendectomy
			43 y. (mean 28.3)	4 months (mean 8.1)	cal peritonitis in 11 prolonged op. in 7

Table (2): Stages of postoperative adhesions and laparoscopic complications.

Stage	Abscent adhesions	St. II	St. III	St. IV	Total
Number (%)	1 (5%)	3 (16%)	7 (37%)	8 (42%)	19 (100%)
Complications			Bladder Injury	Caecal Injury	2 (10.5%)
Conversion			1		1 (5%)

Table (3): Organs incorporated in the postoperative adhesions.

Organ	Number	%	Total cases with adhesions
Omentum	18	100 %	18 (100%)
Abd. Wall	17	95.4 %	
Ileum	12	66.7 %	
Caecum	6	33.3 %	
Pelvic Organs	7	38.9 %	

Diagram (1): Visual analogue pain scale shows pre- and post-operative ranges and mean values of pain scales

