

Laparoscopic Management of Intraabdominal Scarring

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Laparoscopic adhenolysis is procedure designed for patients suffering from symptoms of subacute intestinal obstruction secondary to adhesion formation due to previous abdominal surgeries. A study of 54 cases is presented, which were dealt between December 1991 and June 1994. The presentation, classification and management is being discussed in this article

Key Words: Laparoscopy, Adhenolysis

For decades patients who had been undergoing abdominal operations for a variety of reasons during their long term follow up have been complaining of symptoms such as vague abdominal pain, postprandial fullness, belching, windy abdomen and occasional constipation. Surgeons and physicians have been labelling them under a vast horizon of diseases ranging from Manchausen Syndrome to recurrence of disease etc., but since the advent of modern laparoscopic video imaging, a definite disease entity for most of these symptoms has been named known as Internal scarring and at the same time laparoscopic surgery has benefited patients by providing a cure to this disease¹.

Materials and Methods

During the period December 1991 to June 1994 a total of 54 cases were treated with the clinical diagnosis of intraperitoneal adhesion at Mayo Hospital, and Akram Medical Complex,(Private) Lahore. Of these these 42 were females and 12 were males. Their mean age was 38 years and most of them weighed more than 60 Kg. In this study we did not include patients who had symptoms of acute intestinal obstruction, or who were in a state of shocks, or there was any suspicion of malignancy. Apart from the routine investigations necessary to provide basis for fitness of anaesthesia, abdominal ultrasound for mapping of adhesions and plain x-ray of the abdomen in erect position was done (to determine the part of gut involved) in all cases. Symptoms are shown in table 1.

Table 1 Symptoms

Symptoms	n=
Vague abdominal pain (chronic)	54
Dyspepsia	26
Heaviness around umbilicus	30
Post prandial ballotment	22
Periodic abdominal distension	12
Constipation	10
Intermittent colics	48

Two patients had no previous surgery upon them, both of them were males, both had a history of hypertension and had been on thiazide diuretics and beta blockers. Both of them presented with definitive symptoms and diagnosis were made on a preliminary laparoscopy.

Table 2 Females with previous operations

Operations	n=
Abdominal hysterectomy	18
Caesarian section	05
Previous resection anastomosis	14
Appendectomies	04
For pancreatitis	01
Total	42

Table 3 Previous operations in males

Operations	n=
Previous resection anastomosis	6
Appendectomies	2
Pancreatitis	2
Total:	10

Results

A study of 54 cases of laparoscopic adhenolysis was carried out. The procedures were carried out by the three port technique i.e. a 10mm port for the telescope and two 5mm ports for the grasper and the diathermy scissors. There was no fixed location for the ports as it really depended on the site of the adhesion or the bands.

Preoperative ultrasonographic mapping of the abdomen for suspicion of adhesions and later on for location of site of adhesions was carried out in 37 patients which was done by the same consultant radiologist in all the cases.

The site of adhesion formation intraabdominally was found correct in 32 cases and we think that getting a preoperative ultrasound is quite beneficial for these patients as it has been recommended by other authors also.² The average time taken for the procedure was

38 minutes which would vary according to the number, thickness and site of adhesions. The total duration of stay in the hospital was less than 24 hours in most of the cases. The detailed break up of patients regarding duration of operation and hospital stay and complications is shown in tables 4 and 5. Hospital stay for more than thirty six hours was necessary in two patients who had prolonged paralytic ileus, which settled by conservative means only.

Table 4 Total Duration of Surgery

Duration	n=
Less than 30 minutes	23
Between 30 minutes 2 hour	26
More than 2 hour	05
Total:	54

Table 5 Duration of Stay in the Hospital

Stay	n=
Discharged within 24 hours	41
Discharged after 36 hours	10
Discharged after 48 hours	03
Total:	54

Based upon the preliminary diagnostic laparoscopy we made our own classification regarding the intraperitoneal adhesions and the therapy advised was according to the classification. We classify the intraabdominal adhesions as mature and immature and both of them could be symptomatic or asymptomatic.

Mature scars are clear, avascular and see through and do not bleed or cutting.

Immature scars have been categorized into four stages:

Stage I: Fibrinous Adhesions:

These are thin flimsy attachments seen in the early post operative period ranging between 10-14⁴. These are formed between the loops of gut, and gut and the abdominal wall, liver and anterior abdominal wall⁵. The gut and abdominal still oedematous wall are edematous round the adhesions.

Stage II: Fibrous Bands:

These are clear fibrous strands extending from the anterior or lateral abdominal wall to the antimesenteric border of the gut. These are thick and pillar like and are notorious for internal strangulation, as loops of intestines can undergo rotat around the band. These are quite vascular⁶.

Stage III: Extensive Scarring:

These are most commonly seen in those cases in which upper abdominal or pelvic surgery was carried out and thus are located in the upper abdomen and pelvis, and classically an extensive scar is divided into three zones.

a) Superficial layer... Consists of clear mature adhesions.

b) Middle layer..... Consists of fat admixed in fibrous tissue

c) Deep layer..... Containing a portion of gut.

So during the process of adhenolysis, we have to be very careful because there is a possibility of damaging the gut⁵.

Stage IV: Abdominal Curtain (Multiple Cul-de-sacs)

These are seen after cases of severe peritonitis⁶ specially where a second or third laparotomy had been done whole of the peritoneal cavity is divided into a number of small cul-de-sacs². Loops of small gut are usually pulled up and are adherent to the anterior abdominal wall. Specially a cluster of loops of gut are seen around the umbilicus so the traditional approach of placing the camera port at just the infraumbilical region has to be abandoned and after a hit and trial method or by a combination of abdominal percussion and blind introduction of the veress needle, a place around the umbilicus is found and the 10mm trocar is placed in. preoperative ultrasound mapping is very helpful in these cases⁶. The foremost step in the management is to identify the type and then classify the intraperitoneal adhesions because the management for the mature and immature adhesions is entirely different.

Next is the manipulation of adhesions and instruments. For effective adhenolysis the adhesions have to be placed under gentle traction so as to ensure that no abdominal vicera is inadvertently cut. The position of the telescope and the endoshear can be swapped as per convenience. For adhenolysis it is always better that a parallel vision approach is used i.e. the telescope and instrument being used for adhenolysis should be working in the same direction and not opposite to each other.

We used usually 40 watts soft current for cautery. The area to be adhenolysed is identified, picked up grasped and cauterized after which cutting is done. We must be very careful in this aspect as no cutting should be done before cautery. A special care should be undertaken while doing adhenolysis or appendectomy in pregnant women while using diathermy for the fear of conduction of diathermy current and heat to the foetus through uterine walls³. After all the adhenolysis we place a litre of Dextran-70 in the peritoneal cavity this effectively prevents any recurrence of adhesions.

All the patients have been regularly visiting our follow up clinics, the longest of which was for two years and none of them complained of any recurrence of symptoms.

The Pathophysiology of Adhesion Formation and how laparoscopic Adhenolysis is beneficial for symptomatic patients borne out as follows:

- a). Normally there are no proteins in the peritoneal fluid, However, peritoneal cavity becomes laden with protein fluid rich in fibrin whenever there is any infection. So cases of peritonitis will always lead to adhesion formation (Robbins).
- b). The second cause for protein rich peritoneal fluid is that whenever the pressure in the liver sinusoid rises more than 5-10 mm of Hg, fluid containing large amount of protein begins to transudate through the liver surface into the abdominal cavity⁸.

Discussion:

In abdominal operation involving long incisions such as for laparotomy or Kocher's incision the parietal peritoneum is breached, because of which numerous large lymphatic channels specially in the anterior abdominal wall are cut and blocked⁸. So in large incisions two things happen. One that the peritoneal pore are out open and because of increased pressure in liver sinusoids proteins laden fluid is poured into the cavity and second that these protein molecules cannot be reabsorbed therefore fibrin rich fluid is present in the abdominal cavity because of which fibrous tissue formation is enhanced.

It has been further documented that the mesenchymal cells or the peritoneum lying in the line of incision are transformed into cells which are

precursors of the fibrous tissues, this is the reason that there is a great tendency for the formation of adhesions along the line of incision.

So by the above information we can conclude that whenever we try to do adhenolysis by an open operation the more dense and more numerous adhesions results and would lead to another laparotomy. By doing adhenolysis laparoscopically, the breach in the peritoneum is minimised. The adhesions are diathermized and then cut. There is no bleeding in the abdomen so no protein rich fluid is in the abdomen. The increased peritoneal pressure because of insufflated carbondioxide is always greater than the pressure in hepatic sinusoids therefore proteins cannot transudate from the liver surface (Due to these reasons we claim that laparoscopic adhenolysis is never followed by recurrence).

While performing laparoscopic adhenolysis for the last three and a half years we have concluded that this is an excellent procedure designed for patients suffering from subacute intestinal obstruction secondary to adhesion formation due to previous abdominal surgeries. The procedure is safe, efficacious and cost effective and most of the surgeons who are reasonably trained in the art of laparoscopic surgery can do it to the satisfaction of the patient and the surgical community. The results are excellent and provide a permanent cure to the symptomatic patients.

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