Scholars Journal of Applied Medical Sciences (SJAMS) ISSN 2320-6691 (Online)
Sch. J. App. Med. Sci., 2014; 2(1B):138-141 ISSN 2347-954X (Print)

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2014.v02i01.0027

Research Article

Significance of Intraabdominal Adhesions in Emergency Laparotomies: Effect of Prior Laparotomies

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Abstract: Intraabdominal adhesion formation after abdominal surgery is still a surgical dilemma. It's seen in more than 50% of abdominal surgeries and has a potential of complicating future abdominal surgical interventions. In this retrospective study, we aimed to evaluate the prevalance and severity of intraabdominal adhesions in emergency laparotomies patients operated before. One hundred and one patients who underwent emergency relaparotomy in Department of Surgery of Kırıkkale University Medical Faculty between January 2002-April 2013 were enrolled in the study. The severity of intraabdominal adhesions were evaluated using Zühlke classification. The overall adhesion ratio for this study group was found to be 96%. Medical and medicolegal consequences of intraabdominal adhesions in relaparotomies are of paramount importance. The first and most important approach to minimize this problem is to be aware of this problem. During the inital laparotomy whatever possible should be done to prevent intraabdominal adhesions formation.
Keywords: postoperative adhesions, intraabdominal adhesions, emergency relaparotomy, complications, medicolegal problems, prevention

INTRODUCTION

Intraabdominal adhesion formation after abdominal surgery is still a surgical dilemma. It's seen in more than 50% of abdominal surgeries and has a potential of complicating future abdominal surgical interventions [1]. Although nearly 120 years have passed since it was first decsribed in 1889 and although a myriad of studies have been done, it has been impossible to avoid intraabdominal adhesions completely [1, 2]. In this retrospective study, we aimed to evaluate the prevalance of intraabdominal adhesions in patients operated before.

PATIENTS AND METHODS

One hundred and one patients who underwent emergency relaparotomy in Department of Surgery of Kirikkale University Medical Faculty between January 2002 – April 2013 were enrolled in the study. The study group consisted of patients referred by either emergeny service and other disciplines or who applied to the Department of Surgery. All of the patients had undergone laparotomy before. The study was conveyed processing data from patient files and operation notes.

Patients with a history of disease resulting in an increased incidence of intraabdominal adhesions like tuberculosis, secondary peritonitis or mezothelioma and prior laparotomy due to brid ileus; patients with peritonoventriculer shunt or peritoneal dialysis catheter, history of spontaneous peritonitis, ascites, abdominal irradiation and anastomotic leakage were excluded.

The severity of intraabdominal adhesions were evaluated using Zühlke classification [3] (Table 1). Descriptive analysis was done using SPSS 7.0.

RESULTS AND DISCUSSION

Demographic Data: Thirty nine (38.6%) patients were female and 62 (61.3%) were male. Mean age of patients was 44.4 (min 21-max 86). The indications for emergency laparotomy and operations performed are given in Table 2.
The overall adhesion ratio for this study group was found to be 96%.

When graded for the severity of intraabdominal adhesions using Zühlke's classification, 4 (3.96%) patients were graded as Grade 0, 26 (25.74%) as Grade 1, 44 (43.56%) as Grade 2, 15 (14.85%) as Grade 3 and 12 (11.88%) as Grade 4.

Intraabdominal adhesion is a consequence of defective regeneration of the damaged peritoneum due to the disequilibrium between adhesion formation and adhesiolysis or in other words fibrin formation and fibrinolysis [4, 5]. The result is impaired degradation of

fibrin clinically appearing as adhesion (5). Subsequent laparotomies pose a greater risk for adhesion formation as with each relaparotomy mature collagen synthesis is impaired resulting in defective wound healing [6].

Intraabdominal adhesions cause chronic pelvic or abdominal pain, infertility, recurring episodes of subileus even years after the initial operation [4, 7]. One third of the patients who underwent a laparotomy for any reason are due to experience a second laparotomy because of adhesion related problems. In addition, the rate of hospital admission post laparotomy is 2, 4.5% of which is the result of mechanical obstruction [4].

Yet, the most feared aspect of intraabdominal adhesions following the inital laparatomy is the risk of complicating forecoming laparotomies especially due to inadvertent enterotomies which is the case in 20% of the patients [1]. This fear can even lead the surgeon to look for alternative routes rather than routine abdominal approach for emergeny cases when possible as postoperative intraabdominal adhesions not only carry the risk of accidental enterotomies but also definetely increase the time to treat a high risk pathology especially in intraabdominal bleeding [8] which we observed in our splenectomies performed for trauma.

The complications arising from intraabdominal adhesions in relaparotomies is an important medicolegal problem. Even a minor intestinal wound that is missed in the relaparotomy can end up in peritonitis and the surgeon can easily be sued [17]. The problem is of such an importance that the British Medical Defence Associatons has declared this situation as a seperate and specific entity [9].

In our patient population, nearly 25% of the patients had severe adhesions highlighting the reason for the aforementioned fear.

The complexity of the of the inital laparotomy is the mainstay of intraabdominal adhesions. The wideness of the damaged peritoneum, comorbidities, intraabdominal foreign bodies like talc, accompanying bacterial infection and harsh surgical technique and tissue manipulaton contribute to adhesion formation [1].

Minimizing peritoneal damage has been a favourable approach to decrease adhesion formation and has led to the emergence of laparoscopic surgery and NOTES. Studies indicate that laparoscopy has caused nearly a 50% decrease in intraabdominal adhesions [10, 11].

Mechanical barriers, pharmacologic agents decreasing fibrin formation or increasing fibrinolysis, immunosupressive agents supressing peritoneal inflammation, minimizing peritoneal damage by changing surgical attitude like abandoning peritoneal closure or changing ways of managing the abdominal wound, thermosensitive hydrogel barriers, prosthetic mesh material embedded in viscouse material have all been tried yet with not a great success [10-15]. Laparoscopic adhesiolysis operations have been the latest surgical change in surgical practice [16,17].

Yet, the most effective means of preventing intraabdominal adhesion formation is sticking to the old tradition of good surgical tecnique. Handling the tissue with care, using non-powdered gloves, gentle cleansing of the contaminated abdominal cavity with saline , avoiding dehydration of the viscera during the operation and shortening the time of the operation as much as possible and employing minimal invasive approach should always be kept in mind during all abdominal operations [1].

Table 1: Zühlke Classification

Grade	Description
0	No adhesions
1	Filmy adhesions: easy to separate by blunt dissection; novascularization
2	Stronger adhesions: blunt dissection possible but partly sharp dissection possible (beginning of vascularization)
3	Strong adhesions: lysis possible but sharp dissection only; clearvascularization
4	Very strong adhesions: lysis possible by sharp dissection only (organ strongly attached with severe adhesions and damage of organs hardly preventable)

Table 2: Indications for Emergency Laparotomy

Operation	Number of patients
Gastric perforation	21
Penetrating abdominal trauma (stabbing)	11
Appendectomy	6
Duodenal perforation	4
Hemostasis formultitrauma	4
Emergeny splenectomy	4
Traumatic liverlaceration	5
Penetrating abdominal trauma (GSW)	4
Cholecystectomy	3
Traumatic perforation of small lintestine (lessthan 24 hours)	3
Marginal ulcer perforation	3
Mesenteric vascularocclusion	3
Liver abscess	3
Uninary bladder perforation	2
Sigmoid volvulus	2
Traumatic colonicperforation	2
Retroperitoneal abscess	2
Mechanicalileus (duetotumor)	2
Gallbladder perforation	2
Obstructive Jaundice	1
Meckel Diverticulitis	1
Necrotizing Pancreatitis	1
Retroperitoneal Hematoma	1
Intra abdominal pelvic abscess	1
Parastomal strangulatedhernia	1
Duodenal hematoma	1
Ectopic pregnancy	1
Intra abdominal foreign body	1
Choledocholithiasis	1
Endometriosis	1
Kidney laceration	1
Pseudocolonic obstruction	1
Diaphrag maticrupture	1

CONCLUSION

Medical and medicolegal consequences of intraabdominal adhesions in relaparotomies are of paramount importance. The first and most important approach to minimize this problem is to be aware of this problem. During the inital laparotomy whatever possible should be done to prevent intraabdominal adhesions formation.

ACKNOWLEDGEMENT

Abstract of this study has been submitted to ‘’National Surgery Congress 2014’’ which will take place on April 2014 in Turkey.

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