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Recurrent Postoperative Adhesive Intestinal Obstruction: Role of Early Operative Intervention as a Primary Management

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Abstract:

Introduction: Post-operative adhesions are one of the most common causes of intestinal obstruction. Developing countries has its incidence around 45% and 60% in developed countries. Recurrence rate of intestinal obstruction is upto 45%¹ and mortality rate is as high as 10%². There is a lot of confusion in management of these cases in terms of operative intervention in early stages according to different studies, however spectrum of intraoperative findings observed with postoperative obstruction and their predilection to nature of past laprotomy has bought some stability in management of recurrent postoperative adhesive obstruction. The fact which favours early operative intervention is that it decreases the frequency of obstructive episodes and also increases the duration between them which is the basis of the present study.

Objectives: To study the efficacy of early operative intervention in the patients with recurrent post operative adhesive obstruction along with finding the cause of obstruction, whether correctable and to study the impact of surgery in patients with multiple dense adhesions.

Materials and Methods: This is a prospective study carried out at our institute between April 2009 to March 2014, selecting patients with recurrent postoperative intestinal obstruction having 2nd or more attack excluding those having 1st attack and cause other than post-operative adhesion.

Observations: Recurrent post operative adhesive intestinal obstruction is more common in the age group 41-50 years(32.81%) with predominance in male(65.62%). 97.62% cases were occurred following single laprotomy, 68.75% laprotomies were done in emergency setting. Appendicectomy was the most common emergency surgery and Obstetrics and gynecological surgeries were the most common elective surgeries as a cause. 65.72% of cases had 2 attacks of obstructive symptoms with duration between past laprotomy and 2nd attack was between 13months to 2years(23.43%). 59.37% cases had correctable causes of postoperative adhesions while 40.62% had multiple dense adhesions as a cause of which no patient had any episode of obstructive symptoms on follow up.

Conclusion: Postoperative adhesions are more common following appendicectomy, obstretical and gynecological surgeries with two third patients presenting with correctable cause and surgeries on multiple dense adhesions increases the duration between recurrent episodes and decreases number of obstructive episodes

1. Introduction

Post-operative adhesions are one of the most common causes of intestinal obstruction. Developing countries has its incidence of around 45% and around 60% in developed countries. Recurrence rate of intestinal obstruction is upto 45%¹ and the mortality rate is as high as 10%². This high incidence of recurrence and morbidity and mortality is further aggravated mainly by non-operative management of post-operative adhesions with 'Drip and suction' method causing bands and adhesions to leave in place. There is a lot of confusion in management of these cases in terms of operative intervention in early stages according to different studies, however spectrum of intraoperative findings observed with postoperative obstruction and their predilection to nature of past laprotomy has bought some stability in management of recurrent

postoperative adhesive obstruction. The tendency to equate postoperative obstruction with dense adhesions, lead to neglecting of correctable causes of recurrent postoperative adhesive intestinal obstruction. But the fact which favours early operative intervention is that it decreases the frequency of obstructive episodes and also increases duration between them which is the basis of the present study.

2. Materials and Methods

Prospective analysis of study on recurrent postoperative adhesions was carried out at district hospital Gondia between April 2009 to March 2014.

2.1. Patients

Those fulfilling following criterias were included in the study

- Patients admitted with recurrent postoperative intestinal obstruction(2nd or more attack).
- Patients with recurrent postoperative obstruction undergone surgery
- Patients in whom indications for the 1st laprotomy was known
- Patients undergone surgery with diagnosis confirmed by operative findings
- Patients with recurrent postoperative adhesive obstruction presenting with complication like perforation or gangrene

The patients who had obstruction by other cause than postoperative adhesions, those having 1st attack of obstruction postoperatively, those who refuse to undergo surgery or treated by conservative management and those whose operative findings were not consistent with preoperative findings, were excluded from the study.

2.2. Study Design

Total 64 patients fitting as per mentioned criteria were taken in our study.

They were divided in two groups:

- Patients operated during emergency(44)
- Patients operated electively(20)

Patients treated electively initially underwent blood and radiological investigations, as per requirement, with strict vital monitoring to pick up any complications as early as possible.

2.3. Operative Technique

Standard approach with principles of abdominal reentry, for the midline and paramedian scars, excision of the scars with entry through virgin peritoneum was followed. Any loop adhered to scar was freed and adhesions and bands causing the obstruction either by kinking, angulation, volvulus and closed loop were separated. Multiple filmy adhesions which could be easily separated were not separated. Passible stricture, if found, was treated by stricturoplasty and impassible were treated by resection and anastomosis. Multiple dense adhesions causing obstruction, were divided to relieve the bowel with sharp dissection. Bowel handling was as minimal as possible during the procedure. Intestinal decompression done aborally upto sigmoid colon post procedure followed by thorough abdominal wash. Resected tissue, loop, bands, adhesions were sent for the histopathological examination and abdominal closure was done in single layer.

2.4. Postoperative Management and Follow up

Patients were kept NBM(Nil By Mouth) on IV(Intravenous) fluids and RT(Ryle's Tube) aspiration was continued till regaining of bowel activity in the form of bowel sounds and passing of flatus and motion. After regaining bowel activity RT aspiration was progressively spaced followed by removing RT and starting of oral fluids first followed by soft diet. Wound infections and other general complications, if any, were taken care of. Patients were discharged after removal of stitches. Patients were asked to follow up after 7 days, 1 month and then at 3 monthly interval.

3. Results

This study was carried out at our district hospital in April 2009 to March 2014. Total 64 cases of recurrent postoperative adhesive intestinal obstruction with history of obstructive symptoms for 2 or more times were studied.

3.1. Incidence as per Age

Age(years)	Number of cases	Percentage (%)
21-30	17	26.56
31-40	15	23.43
41-50	21	32.81
51-60	8	12.5
61-70	3	4.68
Total	64	100

Table 1: Age Incidence

Maximum number of patients belong to 41-50 years age group(32.81%) whereas 2nd most common group is between 21-30 years(26.56%). No patients with recurrent post operative adhesions were seen beyond 70 years.

3.2. Incidence as per Gender

Sex	Cases	Percentage (%)
Male	42	65.62
Female	22	34.37

Table 2: Sex Incidence

Maximum incidence is seen in Male, 42 cases (65.62%) and females 22 (34.37%).

3.3. Previous Surgery

Nature of Previous Surgery	Cases	Percentage (%)
Emergency	44	68.75
Elective	20	31.25
Total	64	100

Table 3: Nature of previous surgery

Out of 64 cases, 44 patients(68.75%) had previous surgery on the emergency basis while rest 20 (31.25%) were operated electively.

3.4. Emergency Surgeries Leading to Recurrent Obstruction

Emergency surgeries	Cases	Percentage (%)
Acute Appendicitis	12	18.75
Perforation Peritonitis	12	18.75
Abdominal Trauma	6	9.37
Intestinal Obstruction	10	15.62
Miscellaneous	4	6.25
Total	44	68.74

Table 4: Emergency surgeries leading to recurrent obstruction

Out of 64 cases, 44 were operated on an emergency basis. The most common laprotomies leading to recurrent obstructions are Acute appendicitis, Perforation peritonitis followed by intestinal obstruction while abdominal trauma like blunt or stab as a cause is very rare.

3.5. Elective Surgeries as a Cause of Obstruction

Elective	Cases	Percentage (%)
Obst & Gynaec	10	15.62
Upper GI surgeries	4	6.25
Colorectal Surgeries	2	3.12
Miscellaneous	4	6.25
Total	20	31.24

Table 5: Elective surgeries leading to recurrent obstructions

Out of total 20 elective operations, obstetrical group causes top the list(10) while colorectal surgeries causes recurrent obstruction rarely.

3.6. Number of Attacks of Obstructive Symptoms

Number	Cases	Percentage (%)
2	42	65.62
3	15	23.43
4	5	7.81
5	2	3.12
Total	64	100

Table 6: Number of attacks of symptoms

Most of the patients(42) had 2 attacks of obstructive symptoms(65.62%) while only 2 had attacks for 5 times(3.12%). Rest 15 patients had attack for 3 times(23.43%) and 5 cases presented after 4 attacks.(7.81%).

3.7. Number of Attacks of Obstructive Symptoms in Relation to Duration upto Last Episode of Obstructive Symptom

Duration between past laprotomy and last episode of obstructive symptoms	Number of attacks			
	2 nd	3 rd	4 th	5 th
Upto 12 months	9 (14.06%)	3 (4.68%)		
13 months to 2 years	15 (23.43 %)	8 (12.5%)		
25 months to 5 years	9 (14.06%)	2 (3.12%)	3 (4.68%)	
<5 years	9 (14.06%)	2 (3.12%)	2 (3.12%)	2 (3.12%)

Table 7: Relation between number of attacks with duration of symptoms

It was found that,

- 9 cases have 2nd attack, 3 cases have 3rd attack in 1st year.
- 15 cases have 2nd attack and 8 cases have 3rd attack in 2nd year
- 9 cases have 2nd attack and 2 cases have 3rd attack in between 2nd-5th year.

3.8. Nature of Obstructions

Nature of Obstruction		Number of Case	Percentage (%)
Correctable Causes	Single loop adhesions/ Band adhesions	24	37.5
	Strictures	10	15.62
	Internal Herniation with band	2	3.12
	Volvulus with band adhesion	2	3.12
Multiple causes	Multiple dense adhesions	24	37.5
	Multiple dense adhesions with stricture	2	3.12

Table 8: Nature of obstruction

It was found that multiple adhesions as a cause of obstruction in max 26 (40.62%) of cases. Correctable causes were present in 38 cases(59.37%).

3.9. Previous Laprotomy Related to correctable present operative findings

Previous Laprotomy	Total No.	Correctable causes		Multiple adhesions/ Casues
		Single Adhesion with scar/ band	Stricture	
Surgeries on stomach and duodenum	10 (15.62 %)	1(1.56%)	-	9 (14.06%)
Surgeries on small bowel	26 (40.62 %)	10 (15.62%)	10 (15.62%)	6 (9.37%)
Appendicectomy	12 (18.75 %)	9 (14.06%)	-	3 (4.68%)
Colon surgery	3 (4.68 %)	-	-	3 (4.68%)
Obs. and Gynec Surgeries	10 (15.62 %)	5 (7.81%)	-	5 (7.81%)
Others	3 (4.68 %)	3(4.68%)	-	

Table 9

Findings showed the following facts:

- When surgeries on stomach and duodenum were the cause of obstruction, most common findings were multiple dense adhesions.
- When surgeries on small bowel was the cause, Correctable adhesions, especially strictures, and single adhesions with a scar or band were most common pathologies.
- Surgeries on colon were found to be resulted in dense adhesions.

3.10. Distribution as per Type of Cause

	No. of cases	Percentage (%)
Correctable causes	38	59.37%
Multiple dense adhesion/ causes	26	40.62%

Table 10: Total number of cases with correctable causes of obstruction Vs multiple dense adhesions/ causes

Correctable causes of obstruction in our study were 38(59.37%) while rest of cases 26, multiple dense adhesions were present(40.62%).

3.11. Follow up Patients

Number of obstructive episodes in last 1 year	Number of patients	Number of attacks of obstructive symptoms during 1 year after laprotomy
2	4	0
3	1	0

Table 11: Follow up of patients with multiple dense adhesions

On a retrospective study of patients with multiple dense adhesions, 4 of 16 had 2 episodes in last year and 1 patient had 3 episodes in last 1 year. When these patients were followed for one year, no patient had any episode of obstructive symptom.

4. Discussion

This is a prospective study, to study the early operative intervention in recurrent postoperative intestinal obstruction. Non-operative management of postoperative adhesive obstruction has many drawbacks like it leaves the cause of obstruction in place. Leaving behind a correctable cause like band, single adhesion or stricture, increases the morbidity and mortality by causing recurrent adhesive obstruction as well as exposing the bowel to deadly complications of perforation and/or gangrene.

Peritoneal irritation causes local outpouring of fibrin, which produces adhesions between apposed peritoneal surfaces. They disappear once the source of irritation is removed or they may become revascularized and be replaced by mature tissue³. If injury occurs in raw bleeding well vascularized peritoneal wound, above said is true. If it is accompanied by vascular changes with crushed or ligated then adhesions almost invariable develop. S. Maetani et al⁴ in 1984, has discussed the process of stricture/constriction formation. According to him, stricture/constriction formation is seen in delayed post-operative obstructions. Peritoneal irritation if persists, fibroblastic stimulation in limited areas of band wall produces constriction/stricture.

Total 64 no. of patients with recurrent postoperative intestinal obstruction were studied in this study.

When age incidence was studied, 30 to 50 years of age group predominated with a mean age of presentation was 43.54 years. Many investigations has shown similar incidences.

Sex incidence showed definite male predominance in the present study. Such high incidence was shown by Peter Sykes⁵ (65.38%), S. Illyas⁶ (71.73%). Incidence of recurrent post operative adhesive obstruction was mostly found in patients undergoing emergency surgeries(68.74%). This is comparable with findings of Quatromoni⁷(73.17%), Illyas⁶(71.60%), Meagher⁸(70.6%). Such a high incidence is explained on basis of various factors by Williams in 1981 like peritoneal and bowel handling, chemical infection of peritoneal cavity, billiary leakage, excessive amount of suture material use etc.

Incidence following appendectomy was (18.75%) which is consistent with findings of Quatromoni⁷(26.82%), Illyas⁶(20.09%) and Meagher⁸(21.21%). Sykes found higher incidence(43.47%) and McCune⁹ found Low incidence(8.75%). Small bowel surgeries max accounted incidence was 38.09%, which is also similar to McCune⁹(30.57%). Sykes (8.68%) and Cox (8.3%) show the lowest incidence. When the past surgeries were complicated by burst abdomen or intraabdominal abscesses, operative finding at present laprotomy was multiple dense adhesions.

Maximum number of patients in this study presented after 2nd attack(65.62%) while 23.43% of cases were presented after 3rd attack. Barken¹⁰(1995) have reported mean recurrent rate of 1.94 with standard deviation 1.56.

In our study maximum number of patients were presented in between first two months to four years while 19.04% had episode within a month. As the time passes after 1st attack, the chances of recurrence also increase. After previous laprotomy for any reason, the incidence of recurrent attack ranges upto 19.04%. there were upto 3 attacks of obstructive symptoms. After 2nd year incidence was upto 45.24% and maximum 5 attacks can occur. If patients with potentially correctable cause like single band, adhesion, stricture were operated early after 1st and 2nd attack, recurrent attack of obstruction can be prevented. The similar findings were observed by Meagher in 1984.

Post operative strictures as a cause of obstruction were most commonly found after surgeries of small bowel. Incidence of stricture causing adhesions is found to be 15.62% which were associated with dense adhesions. Similar finding was shown by McCune with incidence 11.42%, in the present study, except one patient who had correctable cause had recurrence once in a follow up of 1 year, all other patients did not have any recurrence. On retrospective evaluation, four patients had 2 attacks and one patient had 3 attacks in last one year. After laprotomy no patients developed any obstructive symptoms in follow up of one year. Hence, by subjecting the patient to surgery, duration between obstructive symptoms can be prolonged and also the frequency of obstructive attacks can be reduced. Barken¹⁰ in 1995 showed similar results.

5. Conclusions

This is a prospective study in which 64 patients with recurrent postoperative adhesive obstruction were included and subjected to laprotomy. Intraoperative findings were noted and patients were followed for one year.

The following conclusions can be drawn:

- i. The incidence of recurrent postoperative adhesive obstruction is more common in age group 30 to 50 years.
- ii. Recurrent post operative adhesive obstruction occur more frequently in male.
- iii. Most of the patients obstructive episodes, have their previous laprotomy for emergency surgeries.
- iv. Two third of the patients of recurrent postoperative adhesive obstruction present within 4 years. Post operative adhesive obstruction are more common in surgeries on small bowel , appendicectomy, obstetrical and gynecological surgeries.
- v. After 2nd episode chances and recurrence of obstructive episode increases so that after 2 years half of the patients may develop recurrence.
- vi. The correctable cause of obstruction is present in upto two third patients with recurrent postoperative adhesive obstruction.
- vii. Surgeries on patients with multiple dense adhesions increases the duration between recurrent episodes and decreases number of obstructive episodes.

6. References

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