

COMPLICATION- AN IN-DEPTH

Original Research Article

 Received
 : 05/02/2023

 Received in revised form
 : 17/03/2023

 Accepted
 : 31/03/2023

Keywords: Incisional hernia, hernioplasty, haematoma, meshplasty, laproscopy.

Corresponding Author: Dr. Aquib Shaick Email: dr.varghese.vt@gmail.com

DOI: 10.47009/jamp.2023.5.2.284

Source of Support: Nil, Conflict of Interest: None declared

Int J Acad Med Pharm 2023; 5 (2); 1353-1356



ANALYSIS

Vivin Thomas Varghese¹, Ashok Gopinath², SM Rajapradeep², Aquib Shaick³

¹Associate Professor, Department of General Surgery, SUT AMS Hospital, Trivandrum, Kerala, India

²Professor, Department of General Surgery, SUT AMS Hospital, Trivandrum, Kerala, India ³Associate Professor, Department of General Surgery, SUT AMS Hospital, Trivandrum, Kerala, India

Abstract

EPIDEMIOLOGY,

Background: Incisional hernia is defined as any abdominal wall gap with or without bulge in a postoperative scar perceptible or palpable by clinical examination or imaging. It complicates 5-11% of all abdominal surgeries as reported by various studies. Incisional hernia repair has evolved over the last century, with a humble anatomical repair to mesh repair and now to laparoscopic and robotic meshplasty. The objective- is to examine the different causes of incisional hernia, incidence rates by age and sex, therapeutic approaches (anatomical repair and meshplasty), and acute postoperative consequences. Materials and Methods: A prospective study was carried out at SUT AMS Hospital, Trivandrum Kerala between May 2021 and April 2022 involving 72 patients with approval from the Institutional ethics committee. Patients presenting to the General surgery department and emergency in our tertiary center with swelling in the abdomen after undergoing surgical treatment are included in this study. Result: The fifth decade was shown to be the most common for incisional hernia, among females (2.6 times more than males), housewives (53.3%), and obese (53.3%) people. Only 1 to 3 years after the initial operation, the majority of patients became aware of the incisional hernia. In 63 of the 72 patients, mesh repair and anatomical repair were combined; this included open and laparoscopic surgery as well as anatomical repair alone in 9 individuals. All patients who had mesh repair had suction drains installed, and they were linked to fewer severe immediate postoperative problems. Conclusion: Incisional hernias occur more often in females as they are more likely to undergo lower abdominal surgeries (gynaecological). The incidence was higher if the patients had post-operative wound infection or dehiscence following the index surgery, had associated risk factors such as chronic cough, constipation, voiding difficulties. Interestingly the tone of abdominal muscles did not play an important role in the incidence of incisional hernia in our study.

INTRODUCTION

Any abdominal wall gap with or without a bulge in a postoperative scar that is detectable or palpable by a clinical examination or imaging is referred to as an incisional hernia.^[1] For many years now, incisional hernia has accompanied abdominal surgery like an unpleasant guest. Incisional hernias have steadily become more common as abdominal procedures have become more common. Iatrogenic hernia is what it is. In patients who undergo abdominal surgery, it happens in 5-11% of cases.^[2,3] Incisional hernias may occur quickly after the initial procedure or a long time later (the surgery following which the hernia developed). The partial dehiscence of the deeper layers of the abdominal wound during the first few weeks after surgery is most likely what caused incisional hernias to form a few months after the index surgery. They typically result from tissue failure when they happen late after the index procedure.^[4] If not addressed to, they can grow to enormous sizes and hurt the patient. In rare circumstances, it could even result in the strangling of internal organs. Even worse it may incarcerate, obstruct, perforate or can cause skin necrosis. An important factor in the aetiology of incisional hernia is the type of suture used to close the wound. Perhaps the best material available is stainless steel

wire, with wound failure rates of less than 1%, but unfortunately most surgeons find the material difficult to handle.^[5] Incisional hernias can form as a result of factors like prolonged coughing, constipation, and trouble urinating that increase intra-abdominal pressure. These elements could be present alone or in conjunction with others. This study looks at the scope of the issue and the numerous contributing factors to incisional hernia development. It also aims to evolve a consensus regarding the best possible management option available.

MATERIALS AND METHODS

It was a hospital based prospective study and patients presenting to the General surgery department with swelling in the abdomen after undergoing surgical treatment are included in this study. The study was done for 1 year (May 2021 to April 2022) at SUT AMS Hospital, Trivandrum Kerala. Based on the previous study [6] 25% of the patients who had the incisional hernia after hysterectomy, precision 10% and with 95% confidence interval, the minimum required sample size is 72. Following formula has been used for the sample size calculation.

Formula

$$n = \frac{Z_{1-\alpha_{2}}^{2} p(1-p)}{d^{2}}$$

Where,

p : Expected proportion

d : Absolute precision

 $1 \text{-} \alpha/2$: Desired Confidence level

Exclusion criteria

Patients with incisional hernias associated with other abdominal wall hernias.

Methodology

A thorough clinical examination was done as a very important step to determine the type, extent and cause of hernia. All patients were analysed for various aspects like age, sex, risk factors, mode of presentation, previous operation, and duration since last surgery, etc. Patients were also evaluated for other risk factors like obesity, hypertension (HTN), diabetes mellitus (DM). Routine investigations like blood & urine routine, renal function test (RFT), chest X-ray (CXR) and electro-cardiography (ECG) were done. The data collected from all the patients was entered into an approved proforma. All the cases were operated, and the procedure adopted was anatomical repair or mesh repair. The choice of surgical technique was based on the size of the hernia defect and associated local factors. Only patients who underwent mesh repair had a drain tube left in situ. The immediate post-operative morbidity, hospital stay, and mortality were noted. **Statistical Analysis**

The statistical analysis was performed using SPSS for windows version 22.0 software (Mac, and Linux). The findings were present in number and percentage analyzed by frequency, percent, and Chi-square test. Chi-square test was used to find the association among variables. The critical value of P indicating the probability of significant difference was taken as <0.05 for comparison.

RESULTS

As per [Table 1] of the 72 patients studied, the youngest was 28 years old and the oldest was 87. The mean age was 53.63 years. There were 3 patients in 2nd decade, 13 in 3rd decade, 14 in 4th, 22 in 5th, 14 in 6th, 4 in 7th decade and 2 in 8th decade. The highest incidence was in 5th decade (P value: 0.0000) and this was statistically significant. There were 52 females (72.2%) and 20 males (27.8%) among the 72 patients studied. P value: 0.0035 and was significant.

As per [Table 2] Of the 72 patients studied, 31 (43.33%) complained of a swelling in the lower midline. 14 (20%) complained of upper midline swelling, 12 (16.7%) lower right abdomens swelling, 5 (6.7%) lower left abdominal swelling, 5 (6.7%) left lumbar, 2 (3.3%) in upper abdomen and 2 (3.3%) had no visible swelling. P value was 0.0002 and significant. The mean duration of the swelling was 32.2 months. The smallest swelling was 2*2 cm and the largest 10*10 cm. Among the 72 patients, 15 (20.8%) LSCS was the index surgery, 13 (18.1%) laparotomy (in general), 12 (16.7%) hysterectomy, 8 (11.1%) CABG, 7 (9.7%) open appendicectomy, 5(6.9%) previous incisional hernioplasty, 4(5.6%) open cholecystectomy, 4 (5.6%) tubectomy and others.

As per [Table 3] 63 ((87.5%)) of 72 patients underwent mesh repair and remaining 9 ((12.5%)) underwent anatomical repair. 63 ((87.5%)) of 72 patients had non absorbable suture material used in their previous surgeries and remaining 9 ((12.5%)) had absorbable suture material used in their previous surgeries. Poly propylene mesh was used in 35 ((48.6%)) of 72 patients, composite mesh was used in 29 ((40.3%)) of patients and no mesh was used in 8((11.1%)) of patients.

As per [Table 4] Drain was placed in half of the patients 36 (50%) and remaining half 36 (50%) were without drain. Out of 72 patients 10 (13.9%) had post-operative SSI, 8 (11.1%) had seroma and 2 (2.8%) had hematoma formation post operatively. 41 (56.7%) patients had omentocoele on clinical examination, 30 (40%) enterocoele and 1 patient could not be evaluated.

As per [Table 5] associations of clinical variables was seen with post-operative seroma patients. The association was not significant with any variable except type of present surgery which was found to be statistically significant (p<0.05). This shows that post-operative complication are not associated with demographic detail or type of healing.

Table 1: Age wise distribution of Study Participants				
Age in years	No. of patients	%		
<30	3	4.2		
30-40	13	18.1		
41-50	14	19.4		
51-60	22	30.6		
61-70	14	19.4		
71-80	4	5.6		
>80	2	2.8		
Total	72	100.0		

Table 2: Etiological Factors and Previous Surgery in Study participants				
Previous Surgery	No. of patients	%		
LSCS	15	20.8		
Laparotomy	13	18.1		
Hysterectomy	12	16.7		
CABG	8	11.1		
Open appendicectomy	7	9.7		
Open Incisional hernioplasty	5	6.9		
Open cholecystectomy	4	5.6		
Incisional hernioplasty	2	2.8		
Tubectomy	2	2.8		
Hysterectomy and laparotomy	1	1.4		
Hysterectomy and open appendicectomy	1	1.4		
Hysterectomy and open Incisional hernioplasty	1	1.4		
Left nephrectomy	1	1.4		
Total	72	100.0		

Table 3: Types of Mesh Used

Tuble of Types of Mesh obed			
Type of Mesh Used	No. of patients	%	
No	8	11.1	
Poly propylene	35	48.6	
Composite	29	40.3	
Total	72	100.0	

Table 4: Post Operative Complications

Tuble 4.1 ost operative complications			
Complications	No. of patients	%	
Seroma	8	11.1	
Haematoma	2	2.8	
SSI	10	13.9	
Drain insertion	36	50	
Omentocoele	30	40	

Table 5: Association of Clinical variables with Post-op Seroma of patients studied.

Variables	Post op Seroma		Total (N=72)	p-value
	No (n=64)	Yes (N=8)	•	
Age in years		· · · · ·		
<30	3(4.7%)	0(0%)	3(4.2%)	0.294
30-40	13(20.3%)	0(0%)	13(18.1%)	•
41-50	11(17.2%)	3(37.5%)	14(19.4%)	
51-60	20(31.3%)	2(25%)	22(30.6%)	
61-70	12(18.8%)	2(25%)	14(19.4%)	
71-80	4(6.3%)	0(0%)	4(5.6%)	
>80	1(1.6%)	1(12.5%)	2(2.8%)	
Gender	· · ·	· · · · ·	· · · ·	
Female	47(73.4%)	5(62.5%)	52(72.2%)	0.677
Male	17(26.6%)	3(37.5%)	20(27.8%)	
Nature of previous surger	ies	· · · · ·	· · · · ·	
Elective	42(65.6%)	5(62.5%)	47(65.3%)	0.151
Emergency	22(34.4%)	2(25%)	24(33.3%)	
Elective and emergency	0(0%)	1(12.5%)	1(1.4%)	
Type of healing				
Primary	62(96.9%)	8(100%)	70(97.2%)	1.000
Secondary	2(3.1%)	0(0%)	2(2.8%)	
Type of Surgery	· · ·	· · · ·	· · · ·	
Open	34(53.1%)	8(100%)	42(58.3%)	0.049*
Laproscopic	24(37.5%)	0(0%)	24(33.3%)	
Robotic	6(9.4%)	0(0%)	6(8.3%)	

DISCUSSION

Among all the hernias treated at our facility, incisional hernias were the second most frequent type. In our analysis, the fifth decade was when incisional hernia incidence peaked. Univariate analysis revealed that age is a major risk factor for incisional hernia. In their study, Ellis, Gajraj, and George,^[7] observed a mean age of 53.63 years. This matched what we discovered. In our study, the oldest patient was 87 years old and the youngest patient was 28. Incisional hernias were more common in females. Females made up 72.2% of the analyzed 72 cases, with a male to female ratio of 1:2.6. This indicates a predominance of women. Incisional hernias were significantly more likely to occur in females. This might be brought on by females having many lower abdominal incisions and multiple pregnancies causing the abdominal muscles to become slack. In their investigation of 383 individuals, Ellis, Gajraj, and George,^[7] identified a prevalence of 64.6% female patients. Male to female ratios of 1:1.17 and 1:1.25 were demonstrated by J.B. Shah,^[8] and Dubey PC et al,^[9] in their respective series. All studies suggest that women were more likely than males to develop incisional hernias. We discovered that housewives had the highest incidence. Given that the majority of our patients were female, this discovery was likely accidental. 96% of patients had stomach pain and/or edema when they first arrived. Only one patient out of seventy-two (3.3%) had pain as their sole symptom. No problems were present in any of the subjects. Lower, midline swellings were found in 43.3% of patients, and they were considerable. This is comparable to Goel's,^[9] and A. B. Thakoreet's,^[10] findings. In our study, gynecological procedures were the index surgery among the 72 patients, with 15 (20.8%) LSCS, 13 (18.1%) laparotomies (generally), 12 (16.7%) hysterectomy, 8 (11.1%) CABG, 7 (9.7%) open appendicectomy, 5 (6.9%) previous incisional hernioplasty, 4 (5.6%) open cholecystectomy, 4 (5.6%) tubectomy, and others. In their respective studies, Ponka,^[11] and Goel,^[9] found 36% incidence and 28.76% incidence, respectively, for gynecological procedures. Our rates were higher; this might be because Caesarian sections are frequently performed by unskilled individuals in remote centers by novice gynecologists. In our study, incisional hernias were repaired using polypropylene mesh and sutures made of the same material. The technique of the repair was determined by the size of the hernia defect, the tone of the abdominal muscles, whether the hernia defect could be approximated without tension, and the patient's overall health. Together with anatomical repair, polypropylene mesh repair was applied to 35 of the 72 patients. Just anatomical repair was employed to treat 8 patients, while composite mesh was used during laparoscopic/robotic meshplasty on 29 patients.

There were no post-operative problems for 52 of our patients. Nevertheless, seroma formation was noted in 8 individuals, SSI in 10 patients, and hematoma formation in 2 cases. The incidence of seroma formation and SSI was much lower in patients undergoing laparoscopic mesh repair. Lall P. et. Al,^[12] reported seroma formation in 6 out of 35 patients and wound infection in 1 out of 35 patients. The lesser rates of seroma formation could be attributed to placement of suction drain in all patients who underwent meshplasty. Meshplasty is widely considered the treatment of choice for incisional hernia.^[13-15]

CONCLUSION

At our facility, incisional hernias were the second most frequent type of hernia after inguinal hernias. It was discovered to be more prevalent among females and housewives in the fifth decade. Lower midline swellings were the most prevalent and almost all patients had a swelling surrounding a post-operative scar. After lower abdominal incisions and in individuals who undergone gynecological procedures, the incidence was greater. Most patients didn't become aware of the hernia until one to three years following the index operation. The majority of patients had mesh repair. All patients who underwent open mesh repair received a suction drain. The most frequent post-operative complication was SSI. More than three-quarters of our patients, though, experienced no post-operative problems.

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