Original Research Article

Incisional Hernia- Management, Epidemiology, Complication- An In-depth Analysis

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Abstract

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.**Objectives:** To analyse the various etiological factors of incisional hernia, the incidence rates for age and sex, therapeutic modalities (anatomical repair and meshplasty) and to study the immediate postoperative complications. **Materials & methods:** A prospective study was carried out at Narayanahrudayalaya institute of medical sciences Bangalore, between May 2017 and April 2018 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.**Results**: Incisional hernia was found to occur more often in the 5th decade, females (2.6 times more than males), and housewives (53.3%), obese (53.3%). Most patients noticed the incisional hernia only 1 to 3 years after the index surgery. A combination of mesh repair along with anatomical repair was carried out in 63 of the 72 patients including both open and laparoscopic repair and anatomical repair alone in 9 patients. Suction drains were placed in all patients who underwent mesh repair and were associated with fewer immediate post-operative complications.**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. Mesh repair was deemed superior to anatomical repair alone as post-operative complications were lesser. There were no recurrences during our follow up period, albeit a longer follow up is required to draw definitive conclusions.

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

Introduction

Incisional hernia is defined as any abdominal wall gap with or without a bulge in a postoperative scar perceptible or palpable by clinical examination or imaging [1]. Incisional hernia has followed abdominal surgery like an unwelcomed guest for decades now. With the increasing number of abdominal surgeries, there has been a steady increase in the incidence of incisional hernias. It is an iatrogenic hernia. It occurs in 5-11% of patients subjected to abdominal operations [2, 3]. Incisional hernias can occur early or late following the index surgery (the surgery following which the hernia developed). Incisional hernias that develop within a few months following the index surgery are likely to have occurred due to partial dehiscence of the deeper layers of the abdominal wound within the first few weeks after operation. When they occur late following the index surgery it is usually due to tissue failure [4]. If left unattended they can progress to massive sizes and cause discomfort to the patient. In some cases, it may even lead to strangulation of abdominal contents. 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]. Other factors are associated with development of incisional hernia are, increasing age, female sex, obesity, chest infections, operative technique and most importantly, wound infection [2]. Factors that lead to the increase in intra-abdominal pressure like, chronic cough, constipation, and voiding difficulty may also contribute to the development of incisional hernia. These factors may be associated solely or in combination with others. This study tries to assess the magnitude of the problem and analyse the various factors that lead to the

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development of incisional hernia. 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 and emergency in our tertiary center with swelling in the abdomen after undergoing surgical treatment are included in this study. The study was done for 1 year (May 2017 to April 2018) at Narayana Hrudayalaya Multispecialty Hospital, Bangalore. Based on the previous study [6] 25% of the 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

$$n = \frac{Z^2_{1-\alpha/2}\, p(1-p)}{d^2}$$

Where,

p : Expected proportion

d : Absolute precision

1- α/2 : Desired Confidence level

Inclusion criteria: All patients presenting with incisional hernias during the study period who underwent surgical treatment.

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 data was tabulated in a master chart using MS EXCEL. The statistical analysis was made using both univariate & multivariate analysis. SPSS version 22.0 was used for analysis.

Results and Observations

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

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.

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

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.

Table 3:Types of Mesh Used

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

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.

Table 4:Post 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

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.

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 surgeries				
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 Present 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%)	

As per table 5 association 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.

Discussion

72 cases of incisional hernia admitted and operated upon in Narayana Hrudayalaya institute of medical sciences, Bangalore between May 2017 and April 2018 are presented in this dissertation. Incisional hernia was the second most common hernia among all the hernias operated in our institution. The peak age incidence of incisional hernia in our study was in the 5th decade. Age was found to be significant risk factor for incisional hernia by univariate analysis. Ellis, Gajraj and George [7] in their study, reported a mean age of 53.63 years. This was in tune with our findings. The youngest patient in our study was 28 and the oldest was 87 years of age. The incidence of incisional hernia was higher in females. Among the 72 cases studied 72.2% were female; male: female ratio was 1:2.6. This shows a female preponderance. Females were at significant risk for developing incisional hernia. This could be due to the laxity of abdominal muscles due to multiple pregnancies and increased number of lower abdominal incisions in females. Ellis, Gajraj and George [7] reported an incidence of 64.6% female population in their study of 383 patients. J.B.Shah [8] and Dubey PC et. al. [9] in their series showed a male to female ratio 1:1.17 and 1:1.25 ratios, respectively. All studies allude to the fact that incisional hernias were more common in women. We found that the incidence was highest among housewives. This finding was probably incidental, as most of our patients were women. Almost all patients presented with abdominal swelling and pain (96.6%). Only 1 out of 72 patients (3.3%) presented with pain as the only symptom. None of the patients presented with complications. 43.3% of patients presented with lower, midline swellings and was significant. This is comparable with the results by Goel [9], and A. B. Thakore et. al. [10]. In our study, the index surgery was gynaecological procedures

among the 72 patients, 15 (20.8%) LSCS, 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. Ponka [11] in his study noted 36% incidence and Goel [9] noted 28.76% incidence among gynaecological procedures. Our rates were higher; this may be because Caesaerian sections are performed at rural centres by inexperienced gynaecologists and at times even by untrained persons. In our study polypropylene mesh and the suture material of the same type was used to repair the incisional hernias and the technique of the repair was decided by the size of the hernia defect, abdominal muscle tone, whether hernia defect could be approximated without tension and general condition of the patient. 35 out of 72 were treated with polypropylene mesh repair along with anatomical repair. 8 patients were treated with anatomical repair alone and composite mesh was used in 29 patients who underwent laparoscopic/robotic meshplasty. Fifty Two of our patients had no post-operative complications. However, SSI was seen in 10 patients, seroma formation in 8 patients and hematoma formation was observed in 2 patients. 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 [13,14,15]. We made similar conclusions.

Conclusion

Incisional hernia was the second most common hernia following inguinal hernia at our institute. It was found to be more common in the 5th decade, in females and in housewives. Almost all patients presented with a swelling involving a post-operative scar and lower midline swellings were the commonest. The incidence was higher following lower abdominal incisions and in patients who underwent gynaecological operations. Most patients noticed the hernia only one to three years after the index surgery. Most patients underwent mesh repair. Suction drain was placed in all patients who underwent open mesh repair. SSI was the commonest post-operative complication. However, more than three fourth of our patients had no post-operative complications. A randomized controlled study may be done to compare the outcomes of mesh repair and anatomical repair.

Conflict of Interest: Nil
Source of support:Nil

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