Original Research Article

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Incidence of incisional hernia with respect to different sites and causes

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ABSTRACT

Background: Of all hernias encountered, incisional hernias can be the most frustrating and difficult to treat. The aim of this study is to find out the incidence of incisional hernia at different sites and to find out their possible causes.

Methods: This was a prospective study of 50 cases of Incisional hernias admitted during the period between July 2017 to July 2019. Collected data is analysed over a period of 3 months. Patients with Incisional hernia satisfying the inclusion criteria, attending surgery OPD at Dr. D. Y. Patil Medical College, Pimpri, Pune were included in study group.

Results: Mean age at presentation was 45 (32/50) were female 18 patients were male. Majority of the patients were obese. Infra-umbilical variety of incisional hernia is most common 42%. The most common primary surgery is tubal ligation was 14 (28%). Significant association noted between diabetes mellitus and SSI, p value <0.05. There is a significant association between addictions (tobacco, smoking and alcohol) and hernias in umbilical region and above p value <0.005.

Conclusions: The incidence of incisional hernia is more in multiparous females. Infra-umbilical midline was the most common site for herniation in 42% of cases. Lower midline incisions are more prone for herniation as the posterior rectus sheath is deficient below arcuate line. The most common previous surgery was tubectomy 14. Diabetes and SSI played important role in causing incisional hernia in our study.

Keywords: Incisional hernia, Risk factors, Surgical site infections, Sites

INTRODUCTION

Incisional hernia is a common surgical problem, a common sequel of surgical interventions. It is the result of a failure of fascial tissues to heal and close following abdominal surgery, complication following abdominal surgery with an incidence varying between 2% and 20%. ¹⁻⁶

Obesity, advanced age, malnutrition, ascites, pregnancy, and conditions that increase intra-abdominal pressure are factors that predispose to the development of an incisional hernia. Obesity can cause an incisional hernia to occur because of increased tension on the abdominal

wall from the excessive bulk of a thick pannus and large omental mass.

Chronic pulmonary disease and diabetes mellitus have also been recognized as risk factors for the development of incisional hernia. Medications such as corticosteroids and chemotherapeutic agents and surgical site infection can contribute to poor wound healing and increase the risk for development of an incisional hernia.

Incisional hernia entails significant morbidity and discomfort resulting in disturbances in day to day activities. Patients with incisional hernia presents with symptoms such as pain, discomfort, cosmetic complaints, skin problems, functional disability, and pulmonary

dysfunction. However, up to one third of patients are not always aware of having an incisional hernia, especially when older or the hernia is small. About half of them don't have any symptoms.^{7,8} The absence of a universal classification system has hindered comparisons within the literature and at meetings, indirectly delaying meaningful conversations about repair techniques and prosthetic choice.

This study was conducted with the objectives to study clinical presentation of incisional hernia and to study the risk factors involved in formation incisional hernia at different sites.

METHODS

This was a prospective study of 50 cases of Incisional hernias admitted in the Department of surgery, Dr. D. Y. Patil Medical College, Pimpri, Pune during the study period from July 2017 to 2019. Collected data is analysed over a period of 3 months, report writing was completed by end of October 2019.

Study population

A total of 50 patients with incisional hernia satisfying the inclusion criteria, attending surgery OPD at Dr. D. Y. Patil Medical College, Pimpri, Pune.

Inclusion criteria

Inclusion criteria were all patients presenting with incisional hernia at Dr. D. Y. Patil Medical College, patients of both sexes, age between 21-80 years and signed informed consent given.

Exclusion criteria

Exclusion criteria were recurrent incisional hernia, strangulated and incarcerated incisional hernia, hernia with malignancy, pregnancy with incisional hernia and immunocompromised patients.

Methodology

A formal written informed consent will be taken from patients to participate in the study. The consent will be taken in a pre-determined format in patient's mother tongue. Those not willing to participate will be excluded from the study.

Statistical analysis

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on mean±SD (minimum-maximum) and results on categorical measurements are presented in number (%). Significance is assessed at 5% level of significance. Student t-test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups Chi-square/Fisher exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

Statistical software

The statistical software namely SPSS 17.0, STATA 8.0, Med Calc 9.0.1 and Systat 11.0 were used for the analysis of the data and Microsoft word and excel have been used to generate graphs and tables etc.

RESULTS

This study was carried out in Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pune during study period of October 2017 to December 2019 in the Department of General Surgery. After proper consenting from patient who met inclusion criteria are included in study.

In our study, the youngest patient was 28 years old and oldest being 71 years old. Most of the patients are between the age group 41-50 and mean age at presentation was 45.

Table 1: Age wise distribution of cases in study group.

Age (years)	No. of cases	%
≤40	10	20.0
41-50	20	40.0
51-60	16	32.0
>60	4	8.0
Total	50	100.0

Table 2: Gender wise distribution of cases in study group.

Gender	No. of cases	%
Male	18	36
Female	32	64
Total	50	100

Out of 50 patients 32 patients were female 18 patients were male. The ratio of male to female is 1:1.7 with female predominance.

The hernias were grouped according to the EHS classification. Majority of them are infra-umbilical (21) followed by suprapubic (10). The hernial sites are grouped into below umbilicus, umbilicus and above and lateral.

Infraumbilical and suprapubic are included in below umbilicus, epigastric and umbilical regions are included in umbilicus and above group and iliac, loin, right subcostal are included in lateral group. Hernias occurring below umbilicus (31) >umbilicus and above (14) >lateral (5).

Table 3: Hernial sites wise distribution of cases in study group.

Hernial sites	S	No. of cases	%
Below umbilicus	Infra- umbilical	21	42
(n=31)	Suprapubic	10	20
Umbilicus	Epigastric	5	10
and above (n=14)	Umbilical	9	18
	Iliac	1	2
Lateral	Loin	2	4
(n=5)	Right subcostal	2	4
Total		50	100

Table 4: Previous surgery (primary surgery) wise distribution of cases in study group.

Previous surgery	No. of cases	%
Epigastric hernia	2	4
Umbilical hernia	4	8
Exploratory laparotomy	10	20
Hysterectomy	5	10
Laparoscopic tubal ligation	2	4
LSCS	8	16
Nephrectomy	2	4
Open appendicectomy	1	2
Open cholecystectomy	2	4
Tubectomy	14	28
Total	50	100

Out of the studied 50 cases, 14 patients 28% tubectomy, 10 patients 20% laparotomies, 8 patients 16% had undergone lower segment caesarean section (LSCS), 5 patients 10% hysterectomy, 4 patients 8% umbilical hernia, and 2 patients cholecystectomy 5% through the right sub costal incision, 2 patients 4% epigastric hernia, 2 patients 4% laparoscopic tubal ligation, 2 patients 4% nephrectomy and 1 patient 2% open appendicectomy.

58% of the incisional hernias followed operations on the female pelvic organs. Highest incidence noticed after tubectomy followed by laparotomy. 68% of the patients had SSI after the primary surgery. The patients with SSI after the primary surgery had given the history of fever after the 3rd day, and required regular dressings and resuturing.

Table 5: Surgical site infection wise distribution of cases in study group.

SSI	No. of cases	%
Yes	34	68
No	16	32
Total	50	100

Table 6: Association between comorbidity and SSI in study group.

	SSI	Z	P		
Comorbidity	Yes (n=34)	No. (n=16)	value	value	
DM	16 (47.06)	3 (18.75)	2.18	0.03	
HTN	11 (32.35)	3 (18.75)	1.08	0.28	
Asthma	2 (5.88)	1 (6.25)	0.05	0.96	
COPD	1 (2.94)	0	1.02	0.31	

Significant association noted between diabetes mellitus and SSI, p value < 0.05.

Table 7: Association between elective/emergency and SSI in study group.

Elective/ emergency	SSI		. 7	
	Yes (n=34)	No (n=16)	z value	P value
Emergency	12 (35.29)	0	4.31	< 0.0001
Elective	22 (64.70)	16	•	

In our study, significant association noted between, SSI and patients who had undergone emergency operative surgery as primary surgery p value <0.05.

Most of the emergency cases are associated with hernias occurring in umbilical region and above. When it comes to the elective procedures the incidence is more below the umbilicus p value <0.05.

There is a significant association between addictions (tobacco, smoking and alcohol) and hernias in umbilical region and above p value <0.005.

In our study, a significant association noted between SSI and sites. The hernias occurring at the umbilicus and above and lateral were associated with SSI when compared to below umbilical region.

Table 8: Association between elective/emergency and sites in study group.

Emaganay/alaatiya	Below umbilicus	Umbilicus and above	Lateral	Total
Emergency/elective	N (%)	N (%)	N (%)	N (%)
Emergency	2 (6.45)	9 (64.29)	1 (20)	12 (24)
Elective	29 (93.55)	5 (35.71)	4 (80)	38 (76)
Total	31 (100)	14 (100)	5 (100)	50 (100)

Chi-square = 17.73, p<0.0001.

Table 9: Association between addiction and sites in study group.

A ddietien	Below umbilicus (n=31)	Umbilicus and above (n=14)	Lateral (n=5)	Chi-square	P value
Addiction	N (%)	N (%)	N (%)		
Tobacco	8 (25.81)	10 (71.43)	2 (40)	8.36	0.015
Smoking	0	6 (42.86)	2 (40)	15.56	< 0.0001
Alcohol	0	4 (28.57)	0	11.18	0.004

Table 10: Association between SSI and sites in study group.

SSI	Below umbilicus	Umbilicus and above	Lateral	Total
	N (%)	N (%)	N (%)	
Yes	17 (54.84)	12 (85.71)	5 (100)	34 (68)
No	14 (45.16)	2 (14.29)	0	16 (32)
Total	31 (100)	14 (100)	5 (100)	50 (100)

Chi-square = 6.84, p=0.033.

DISCUSSION

Age

In our study, the youngest patient was 28 years old and the oldest patient was 71 years old. The mean age at presentation was 45 years.

In our study, highest number of cases was found to be between 41-50 years, which is comparable to Agarwal et al (41-50 years), Deshmukh et al (31-40 years), Jaykar et al (61-70 years), Malviya et al (51-60 years), and Purushothaman et al (31-40 years). 9-13

Sex

Out of 50 patients 32 patients were female 18 patients were male. The ratio of male to female is 1:1.7 with female predominance. Another studies Deshmukh et al male: female ratio was (4.5:1) and male to female ratio was Jaykar et al (1:1.95.), Malviya et al (1:1.90), and Purushothaman et al (1:5.21), and Agarwal et al (1:1.63). All the studies had female predominance except Deshmukh et al study where male: female ratio was (4.5:1). 9-13

Clinical presentation

Majority of the patients presented with swelling over the line of scar of previous surgery. In our study out of 50 patients 3 patients presented with irreducible hernia. In Jaykar et al study 6 patients presented with irreducibility, in Deshmukh et al study out of 50, 5 patients presented with irreducibility, Malviya et al 2/224, and Agarwal et al 14 out of 100 presented with irreducibility.⁹⁻¹²

BMI

In our study out of 50 patients 19 (38%) patients were obese i.e., BMI >30, In Jaykar et al study 8 patients were obese, Malviya et al 18% patients are obese and Purushothaman et al 25% patients are obese. 11-13

Risk factors

In our study, the possible risk factor was found to be between SSI (68%) and tobacco 40%, which is comparable to Agarwal et al SSI (47%), in Jaykar et al constipation played a major role in causing hernia, in Malviya et al SSI accounts for 50%. 9,11 Smoking is a significant risk factor in our study which is comparable to Jaykar et al. 11 In all the given studies SSI played a vital role in causing incisional hernia.

Site of hernia

Out of all the anatomical sites incisional hernia was found to be occurred most in Infra umbilical site 21 cases 42% followed by suprapubic and umbilical 9 cases each 18%. In Jaykar et al study the most common site was infra-umbilical 21 cases 42% followed by umbilical 16 cases 32%.¹¹ In Deshmukh et al study lower midline accounts 37 cases 74% Malviya et al 47%, Purushothaman et al 80%, and Agarwal et al 68%.^{9,10,12,13} The incisional hernias are mostly associated with lower midline incisions rather than upper midline incisions.

Previous abdominal surgery

The most common previous abdominal surgery is tubectomy or tubal ligation in most of the studies mentioned below. In Jaykar et al study 34%, in Deshmukh et al study 28% and in our present study it is 28%, in Malviya et al 33% of them had undergone exploratory laparotomy, and Purushothaman et al 65% had undergone LSCS. ¹⁰⁻¹³

Most of the patients had undergone gynaecological procedure before.

CONCLUSION

It can be concluded that incisional hernia is more common in multiparous females commonly affecting age group between 41-50 years. Infra-umbilical midline was

the most common site for herniation as the posterior rectus sheath is deficient below arcuate line. The most common previous surgery was tubectomy (14/50) followed by exploratory laparotomy (10/50) and lower segment caesarean section (7/50). There is significant association noted between diabetes and SSI. Significant association is noted between SSI and emergency cases when compared with elective cases. SSI could be a possible risk factor for hernias occurring at upper midline incision (p=0.0002).

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Institutional Ethics Committee

REFERENCES

- 1. Hodgson NC, Malthaner RA, Ostbye T. The search for an ideal method of abdominal fascial closure: a meta-analysis. Ann Surg. 2000;231(3):436-42.
- 2. Eisner L, Harder F. Incisional hernias. Chirurg. 1997;68(4):304-9.
- Klinge U, Prescher A, Klosterhalfen B, Schumpelick V. Development and pathophysiology of abdominalwall defects. Chirurg. 1997;68(4):293-303.
- 4. Mudge M, Hughes LE. Incisional hernia: a 10 years prospective study of incidence and attitudes. Br J Surg. 1985;72(1):70-1.
- 5. Santora TA, Roslyn JJ. Incisional hernia. Surg Clin North Am. 1993;73(3):557-70.
- 6. Schumpelick V, Klinge U, Welty G. Meshes within the abdominal wall. Chirurg. 1999;70(8):876-87.

- 7. Nieuwenhuizen J, Halm JA, Jeekel J, Lange JF. Natural course of incisional hernia and indications for repair. Scandinavian J Surg. 2007;96(4):293-6.
- 8. Ah-kee EY, Kallachil T, O'Dwyer PJ. Patient awareness and symptoms from an incisional hernia. International surgery. 2014;99(3):241-6.
- 9. Agrawal M, Singh H, Sharma SP, Singh NK, Kaul RK, Chaudhary R. Prevalence, Clinical Presentation, and Management of Incisional Hernia in the Indian Population: A Cross-sectional Study. Int J Sci Stud. 2016;4(7):51-4.
- Deshmukh SN, Varudhkar AS, Chopde AV. Clinical study and management of incisional hernias: a prospective monocentre experience. Int Surg J. 2017;4:1657-61.
- 11. Jaykar RD, Varudkar AS, Akamanchi AK. A clinical study of ventral hernia. Int Surg J. 2017;4:2326-9.
- 12. Malviya A, Patel A, Bhardwaj G, Bulchandani HP, Saini V. A comprehensive study on the incidence and management of incisional hernia. Int Surg J. 2017;4:2303-7.
- 13. Purushothaman R, Rubby SA, Stephen EJ. Clinical study of incidence and surgical management of incisional hernia. Int Surg J. 2016;3:1875-8.

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