



ORIGINAL RESEARCH PAPER

Surgery

ASSESSMENT OF ETIOLOGICAL FACTORS, CLINICAL PROFILE AND SURGICAL OUTCOME OF INCISIONAL HERNIA

KEY WORDS: Incisional hernia, Etiological factors, Clinical profile, Prolene, Mesh, Peritoneal

Dr. Ashwin S. Bokare*

Junior Resident; Dr. Panjabrao Deshmukh Memorial Medical College, Amravati. Maharashtra, India*Corresponding Author

Dr. Rajiv M. Mulmule

Associate Professor; Dr. Panjabrao Deshmukh Memorial Medical College, Amravati. Maharashtra, India

Dr Varsha D Kudmethe

(Junior resident PDMMC Amravati)

ABSTRACT

Background: Incisional hernia is an iatrogenic complication of abdominal surgery and an important cause of morbidity. The present study was undertaken to assess the etiological factors, clinical profile and surgical outcome of incisional hernia. **Method:** This observational study was conducted in 50 patients of either sex with incisional hernia in the Department of Surgery, at a Tertiary Care Hospital from 1st Jan 2018 to 31st Dec 2018 and follow-up till 30th June 2019 (6 months). **Results:** The majority of patients (34%) were in the age group of 50 to 60 years with females' predominance (62%). Swelling at the point of previous incision was the most common complaint (46%). Bladder Outlet Obstruction (72%) was the main etiological factor followed by emergency previous surgery (64%), constipation (60%) and chronic cough (58%) for the development of incisional hernia. Cough impulse (84%) was the commonest clinical feature followed by reducibility (82%) edema (60%), and tenderness (58%). Prolene mesh-onlay was the most common mode of management (18; 36%) followed by Prolene Mesh-sublay (14; 28%). The mean- time interval of onset of herniation was 6.82±3.90 years, duration after previous surgery 10.36±4.48 years, defect size 13.10±8.80 square cm, duration of surgery 144.60±60.53 min, duration of hospital stay 3.48±1.59 days and mean follow-up was 46.30±10.5 days. **Conclusion:** In the highlight of the current results, it was found that extra-peritoneal onlay tension-free incisional hernia repair using polyester mesh was found to be an easy and safe procedure with no major complications post surgery.

Introduction

An incisional hernia is the protrusion of the contents of a cavity (usually the abdomen) through a previously made incision in the compartment's wall. It is a common surgical condition encountered in day-to-day practice. Based on national operative statistics, incisional hernias account for 15% to 20% of all abdominal wall hernias. Several technical and patient-related factors have been linked to the occurrence of incisional hernias [1]. Moreover the various etiological factors of incisional hernia are: 1) Weaknesses of surgical wounds that may be due to hematoma, seroma and infection and 2) Increased intra-abdominal pressure that may be due to chronic cough, constipation, urinary obstruction, pregnancy and ascites [2].

The mode of management of incisional hernia ranges from anatomical repair to laparoscopic intervention. In open surgical repair, the weakened scar tissue of the abdominal wall is excised and repair is reinforced using a prosthetic mesh. The laparoscopic hernia repair is the new technique of surgical method. In this method, the mesh is applied underneath the abdominal muscle through a small incision to the sides of hernia. Advantages of laparoscopic incisional hernia repair are no re-incision, less painful, safe, speedy recovery and less recurrence [3]. While treating the patients suffering from incisional hernia, there are various types of mesh that can be used including permanent, absorbable, synthetic and biological. The use of mesh is most suitable for the repair of hernia as it reduces the recurrence rate manifolds. The various techniques of mesh placement include above the fascial defect i.e. onlay, between the fascial edges i.e. inlay, below the fascial defect but above the posterior rectus sheet i.e. sublay and intraperitoneally below the fascial defect i.e. underlay [4].

In addition, as many factors contribute to the formation of incisional hernia, which can occur at the site of any type of abdominal surgery previously performed on a wide range of individuals, there is no outstanding profile of an individual most likely to have an incisional hernia. Men, women, and

children of all ages and ethnic backgrounds may develop an incisional hernia after abdominal surgery. The aim of the present study was to evaluate the incidence and clinical presentation of incisional hernia in elective abdominal surgery and emergency abdominal surgery, to enumerate the different causal factors for incisional hernia in abdominal surgery in our hospital setup and to evaluate the mode of prevention and proper management for incisional hernia.

Material and Methods

After obtaining Institutional Ethical Committee approval, this observational study was conducted in 50 patients of either sex with incisional hernia in the Department of Surgery, at a Tertiary Care Hospital over a period of 1 year from 1st Jan 2018 to 31st Dec 2018 and follow-up till 30th June 2019 (6 months). The patients were taken for the scope of study after their willingness to participate in the study. The patients who refused to participate in the study, those unfit for surgery and patients with strangulated and incarcerated incisional hernia were excluded from the study.

A detailed history of patients was recorded and a detailed general and systemic examination was carried out as per proforma. Also the patients were undergoing radiological investigations (chest X-ray, ultrasonography). For preoperative recommendation the investigative profile needed for the study was blood grouping and rhesus factor typing, haemoglobin, routine blood investigations (Random Blood Sugar, Blood Urea and Serum Creatinine), X-ray Chest – Postero-anterior View and Electrocardiogram (ECG).

Various parameters such as age and sex distribution, mode of presentation, time interval of onset of herniation, common etiological factors predisposing incisional hernia, frequency of hernia with reference to the type of incision and type of surgery (emergency/elective and infected/non-infected) and mode of management were studied. For post-operative examination, each patient had taken post-operative care in the ward and was followed up after 1 week, 2 weeks, 30 days and 6 months.

Statistical analysis

Data were entered in Microsoft Excel and was analysed by using SPSS (Statistical Package for the Social Sciences) Software and appropriate tests of significance (p<0.05) were applied.

Observation and Results

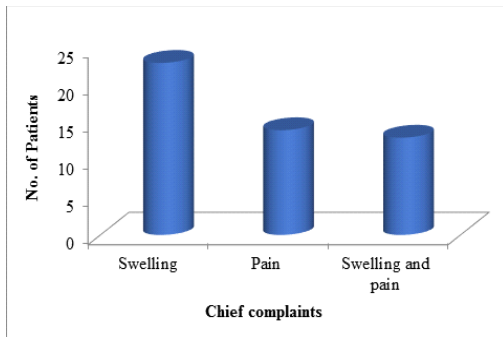
A total 50 cases of incisional hernia were enrolled in the study, among them 31 (62%) were females and 19 patients (38%) were male. The maximum number of cases (34%) presented between 51–60 years of age for the first time followed by 13 cases (26%) presented between 41–50 years of age as shown in Table 1. The mean age of the patients was 54.12±10.68 years, ranged from 33 to 76 years.

Table 1: Distribution of patients according to age group

Age Group in years	Frequency	Percent
31-40	06	12.0
41-50	13	26.0
51-60	17	34.0
61-70	09	18.0
71-80	05	10.0
Total	50	100.0

Figure 1 show the distribution of cases according to their chief complaint. The most of the cases had swelling as their chief complaint (46%) followed by pain (285).

Figure 1: Distribution of cases according to chief complaints



From the table 2 it was observed that the hypertension, diabetes mellitus, asthma, tuberculosis, history of wounds infection, tobacco consumption, hypoproteinemia and smoking, was absent in majority of the patients. While chronic cough, constipation, anemia, bladder outlet obstruction was present in majority of the patients. Also the majority (64%) of the patients had emergency previous surgery. 56% of the patients were non-vegetarian and the remaining 44% of the patients were vegetarian. The job profile for majority 52% of the patients was non-sedentary.

Table 2: Etiological factors associated with incisional hernia

Etiological factors	Frequency	Percent
Hypertension	14	28
Diabetes Mellitus	11	22
Asthma	03	6
Tuberculosis	04	8
History of wounds infection	19	38
Chronic cough	29	58
Tobacco	15	30
Constipation	30	60
Hypoproteinemia	23	46
Smoking	14	28
Anemia	26	52

Bladder Outlet Obstruction	36	72	
Types of previous surgery	Emergency	32	64
	Elective	18	36
Diet	Non-Veg	28	56
	Veg	22	44
Job profile	Non-Sedentary	26	52
	Sedentary	24	48

From the table 3 it was observed that the pallor, icterus, clubbing, spine deformity, visible peristalsis was absent in majority of the patients while the edema (60%), midline incision (30%), cough impulse (84%), tenderness (58%) and reducibility (82%) was present in majority of the patients. Also in majority (56%) of the patients the shape of swelling was spherical.

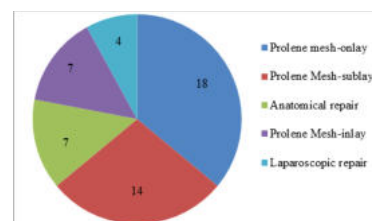
Table 3: Clinical profile of the patients

Clinical profile	Frequency	Percent	
Pallor	04	08	
Edema	30	60	
Icterus	04	08	
Cyanosis	12	24	
Clubbing	02	04	
Spine deformity	01	02	
Cough impulse	42	84	
Visible Peristalsis	04	8.0	
Tenderness	29	58	
Reducibility	41	82	
Shape of swelling	Spherical	28	56
	Pyriform	22	44
Previous type of incision	Midline	15	30
	Infraumbilical midline	12	24
	Infraumbilical transverse	07	14
	Right paramedian	06	12
	Right subcostal incision	06	12
	Gridiron	03	6.0
	Right subcostal	01	2.0

Prolene mesh-onlay was the most common mode of management done in 18 (36%) patients and Prolene Mesh-sublay was the second most common management done in 14 (28%) cases as shown in figure 2.

Specimen of scar tissue for culture was negative for majority (39;78%) of the patients while positive in 11 (22%) cases.

Figure 2: Mode of management



Postoperatively, fever, wound infection and pain were present in 6%, 10% and 10% of patients respectively. The surgical outcome of incisional hernia is shown in table 4.

Table 4: Surgical outcome of incisional hernia

Outcome	Minimum	Maximum	Mean ± SD
Time interval of onset of herniation (years)	01	16	6.82±3.90
Duration after previous surgery (years)	03	25	10.36±4.48
Defect Size (square centimeter)	04	42	13.10±8.80
Duration of Surgery	70	330	144.60±6.53
Duration of Hospital Stay	01	09	3.48±1.59
Follow-up till (Days)	30	64	46.30±10.50

Image 1: Pre-operative images- a) Leg raising Test, b) Incisional Hernia from lower mid line incision, c) Incisional hernia from midline incision

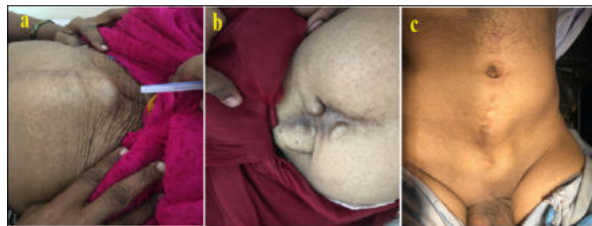
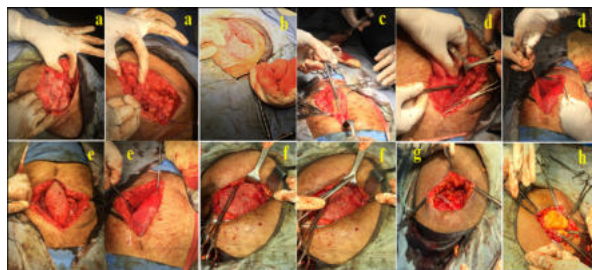


Image 2: Intra-operative images- a) Sub-lay Mesh fixation and closure of Abdomen, b) On-lay Mesh Repair, c) Separation of hernial sac, d) Sub-lay Mesh Fixation, e) Closure of rectus sheath, f) On-lay Mesh repair, g) Suction Drain kept in subcutaneous plane, h) Separation of hernial sac



Discussion

An incisional hernia is common surgical problem which results due to failure of fascial tissues to heal and close following laparotomy [5]. Of all hernias encountered, incisional hernias can be the most frustrating and difficult to treat [3, 5 and 6]. Mean age of occurrence of incisional hernia in present study was 54.12±10.68 years which is consistent with various Indian studies [5-7]. The majority of patients (34%) belonged to 51-60 years of age group which is comparable with the study done by Bhamre et al [8]. The females clearly outnumbered the males in our study. Similar observations were reported in earlier studies [8-12]. The higher incidence of incisional hernia in female population may be due to laxity of the abdominal muscles due to multiple pregnancies and increased number of lower abdominal incisions in females. Swelling at the point of previous incision was the most common complaint faced by majority of the patients which is comparable with previous studies [9, 13, and 14]. Bladder Outlet Obstruction (72%) was the main etiological factor followed by emergency previous surgery (64%), constipation (60%) and chronic cough (58%) for the development of incisional hernia. In Naved et al study, postoperative wound infection was the main etiological factor for the development of incisional hernia. The other general factors were chronic constipation, chronic cough and anemia etc [10].

Prolene mesh-onlay was the most common mode of

management (36%) which is correlated with the study conducted by Daware et al [11] where 34.37% patients underwent onlay mesh repair. The mean defect size was 13.10±8.809 square centimeter. However, according to the study of Nanjappa et al [15] the mean defect size was 15.5 square centimeter. The majority of the patients had emergency nature of surgery and in most of the patients midline was the previous type of incision, These findings are similar to the study conducted by Deshmukh et al [14] and Purushothaman et al [16]. The mean-time interval of onset of herniation was 6.82±3.90 years. In Naved et al study the maximum patients (40%) of incisional hernia occurred between 1-2 years [10]. Bucknell et al [17] in their study reported that 42% patients presented with hernia 1-5 years after primary surgery. The mean follow up period for the current study was 46.30±10.502 days. Contrastingly, as per the study of Machairas et al [18] the mean follow up period was 54.4 months which was greater than the our study.

Conclusion

Female predominance was seen in incisional hernias and most of the incisional hernias presented in 6th decades followed by in 5th decades. Swelling was the most common complaint in most of the cases. The study also found that recurrence rate was more in emergency operated cases. Bladder Outlet Obstruction was the main etiological factor for the development of incisional hernia.

In the light of the current results, it was found that extraperitoneal onlay tension-free incisional hernia repair using polyester mesh was found to be an easy and safe procedure with no major complications post surgery. It was also observed that the incidence of reducible hernia was more as compared to the non-reducible hernia. The mean duration after previous surgery and the development of hernia was more than 10 years.

References

- Rucinski J, Margolis M, Panagopoulos G, et al. Closure of the abdominal midline fascia: Meta-analysis delineates the optimal technique. *Am Surg.* 2001;67:421-426.
- Sanchez VM, Abi-Haidar YE, Itani KM. Mesh infection in ventral incisional hernia repair: incidence, contributing factors, and treatment. *Surg Infect (Larchmt)* 2011;12:205-210.
- Anthony T, Bergen PC, Kim LT, et al: Factors affecting recurrence following incisional herniorrhaphy. *World JSurg.* 2000;24:95-100.
- Kingsnorth A. The management of incisional hernia. *Ann R Coll Surg Engl.* 2006;88(3):252-260.
- Gray SH, Hawn MT, Itani KM. Surgical progress in inguinal and ventral incisional hernia repair. *Surg Clin N Am.* 2008;88(1):17-26.
- Mangam NP, Bodade RM, Dhurve AS, Awasarmol S, Jahagirdar DP, Gajbhiye RN. Study of laparoscopic repair of abdominal incisional hernia. *Int Surg J.* 2018;5(8):2760-6.2.
- Sailes FC, Walls J, Cuelig D, Mirzabeigi M, Long WD, Crawford A, et al. Ventral hernia repairs: 10-year single-institution review at Thomas Jefferson University Hospital. *J Am Coll Surg.* 2011;212(1):119-23.
- Bhamre SD, Pingale ND. A clinical study of incisional hernia. *MVP J Med Sci.* 2016;3(1):1-6.
- Garg N, Batra P, Bali S. The clinical study of the incisional hernia and its management. *Int Surg J* 2017;4:2281-7.
- Naved MM, Malua S, Bodra P, Lakra PS, Nishant, Tirkey AK. Study of clinical profile and management of incisional hernia. *International Journal of Contemporary Medical Research* 2017;4(4):965-967.
- Daware A, Akhtar M, Zaki BM. Incisional hernia: predictive factors, clinical presentation and management. *Int Surg J* 2019;6:1618-21.
- 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 Jun 22;4(7):2303-7.
- Kondreddy S, Rigved N. Incisional hernia- a prospective study of 50 cases for 1 year. *Indian J Appl Res.* 2014;4(5):403-7.
- Deshmukh SN, Varudkar AS, Chopde AV. Clinical study and management of incisional hernias: a prospective monocenter experience. *Int Surg J* 2017;4:1657-61.
- Nanjappa N, Mohanty A, Smile R. Incisional hernia repair – a clinical study of 30 patients. *Int J Cur Res Rev.* 2013;05(15):35-41.
- Purushothaman R et al. Clinical study of incidence and surgical management of incisional hernia. *International Surgery Journal.* 2016;3(4):1875-78.
- Bucknell TE, Cox PJ, Ellis H. Burst abdomen and incisional hernia: A prospective study of 1129 major laparotomies. *Br Med J (Clin Res Ed).* 1982;284:931-3.
- Machairas A. et al. Incisional hernioplasty wit extraperitoneal onlay polyester mesh. *Am Surg.* 2004;70(8):726-29.