Original Research Article

DOI: http://dx.doi.org/10.18203/2349-2902.isj20171616

Clinical study and management of incisional hernias: a prospective monocenter experience

Santoshkumar N. Deshmukh*, Anagha S. Varudkar, Anant V. Chopde

Department of General Surgery, Dr. Vaishampayan Memorial Government Medical College, Solapur, Maharashtra, India

Received: 21 February 2017 Accepted: 29 March 2017

*Correspondence:

Dr. Santoshkumar N. Deshmukh, E-mail: santoshkumarndeshmukh@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Incisional hernia is the most frequent postoperative complication following abdominal surgery. Several studies have shown that incisional hernias have different etiologies which are related to the patient, the surgical technique, the suture material, and experience of the surgeon. Aim of present study was to assess the magnitude of problem, analyse various factors leading to development of this condition, different modalities of treatment practiced, postoperative complications, various factors affecting surgical outcome in these patients.

Methods: This prospective descriptive study was conducted in department of surgery at a tertiary care teaching hospital at Solapur, Maharashtra, India from January 2014 to December 2016. All the patients, regardless of age and gender, admitted with diagnosis of incisional hernia were included in the study. Depending upon the size of defect treatment was carried out. Postoperatively patients were followed up for detection of possible complications and their treatment.

Results: Total 50 patients of incisional hernia were studied. Mean age was 46 years with male to female ratio 4.5:1 wound infection in the post-operative period was the commonest etiology noted followed by obesity.

Conclusions: Wound infection following previous surgery was the most important risk factor associated with incisional hernia. The other risk factors were obesity and COPD. Polypropylene mesh repair is superior to anatomical repair as it has less recurrence.

Keywords: Anatomical repair, Etiology, Incisional hernia, Mesh repair

INTRODUCTION

Incisional hernia is an iatrogenic hernia.¹ It is a common complication after abdominal surgery with a reported incidence of 11-20%.² Incisional hernia is defined as any abdominal wall gap with or without a bulge in the area of a postoperative scar perceptible or palpable by clinical examination or imaging.³ More often than not the problem is recurrent and tests the abilities of even the most experienced surgeons.⁴ Unlike other abdominal wall hernias, which occur through anatomical points of weakness, incisional hernias occur through a weakness at the site of abdominal wall closure.⁵

Before the introduction of general anaesthesia by Morton in 1846, incisional hernias were rare. As survival after abdominal surgery became more common so did the incidence of incisional hernias.⁶ Until recently, incisional hernias were thought to result mainly from a technical failure in the surgical closure of the abdominal wall.⁷ The postulated predisposing factors for incisional hernia are obesity, diabetes mellitus, steroids, smoking, sub-optimal surgical technique, old age, malnutrition, multiple laparotomies, chronic pulmonary disease, type of incision and closure including suture material used and the most important wound infection.⁸ Despite the increasing progress of modern surgery, the optimum surgical treatment of incisional hernia is still an unanswered problem.⁹ The introduction of prosthetic mesh revolutionised the treatment of groin hernia but, to date, has had little impact on the treatment of incisional hernia.¹⁰ The present study entitled is undertaken to assess the magnitude of problem, analyse various factors leading to development of this condition and different modalities of treatment practiced, postoperative complications and their management, various factors affecting surgical outcome in these patients.

METHODS

After obtaining the institutional ethics committee approval, present prospective descriptive study was carried out in the department of surgery at a tertiary care teaching hospital at Solapur, Maharashtra, India. Present study was carried out for a period of 2 years (January 2014 to December 2016) on 50 patients.

Inclusion criteria

- All the patients of incisional hernia having age of 18 years and above18 years and less than 70 years, irrespective of sex, will be included in this study.
- Both electively and emergency operated cases of incisional hernia will be included in this

Exclusion criteria

- Patients of incisional hernia with co-morbidities like abdominal malignancy, cirrhosis with end stage liver disease.
- Pregnant patients with incisional hernia.
- Patients less than 18 years and more than 70 years of age.
- Patients with recurrent incisional hernia.

On admission detailed history regarding, time of appearance and duration of swelling after index surgery, pain associated with swelling, indication of previous abdominal surgery,

history of post operative complications at that time, type of surgery, post operative complications like wound infection, wound dehiscence occurred during previous surgery were recorded from the patient in the prescribed proforma. Also enquiry made about cough, constipation, symptoms of prostatism in males, steroid therapy, smoking status. Height and weight of patient measured for calculation of BMI (Body mass index). Inquiry was also being made regarding the patients medications, past medical history and chronic medical conditions (like diabetes, hypertension, tuberculosis) in addition to drug allergy and alcoholism. When patients with incisional hernia presented with intestinal obstruction in emergency department they were resuscitated initially and when became haemodynamically stable, shifted for radiological procedures and then in surgical ward.

Necessary laboratory investigations (like complete blood count, blood sugar, HIV and Hepatitis B status, urine analysis) were performed. Due informed written consent of the patient and relatives was taken before surgery. Depending on the size of defect either anatomical repair or onlay prolene mesh repair was carried out. Patients having defect 3cm and less than 3cm were subjected to anatomical repair while those having defect more than 3cm were subjected to prolene mesh repair. The data collected were entered into MS-Excel sheets and analysis was carried out using statistical package for social sciences (SPSS-version 16.) On the basis of analysis and observation, results were drawn and discussed and compared with other relevant literatures. At discharge patients were advised to avoid lifting heavy weights for a period of 6 weeks.

RESULTS

During the study period, consecutive 50 patients of incisional hernia undergoing surgical repair were included.

Table 1: Age and sex incidence.

Age	Number of cases		Total	Percentage	Mean
(years)	Male	Female			age
18 - 30	5	2	7	14%	
31-40	13	1	14	28%	
41-50	11	3	13	26%	16
51-60	8	2	8	16%	40 Vears
61-70	8	1	8	16%	years
Total	41	9	50	100%	

The most vulnerable age group in this study was 31to 40 years (28%). The next most common age group affected was 41 to 50 years (26%). Mean age of the patient in our study was 46 years. Out of 50 cases studied, 41 were females and 9 were males with female to male ratio of 4.5:1. Thus females clearly outnumbered the males in present study.

Table 2: Mode of presentation of patients.

Presentation	Number of cases	Percentage
Swelling	34	68%
Pain and swelling	16	32%
Pain	0	0.00 %

Table 3: Distribution of patientaccording to reducibility.

Incisional hernia	Number of cases	Percentage
Reducible	45	90%
Irreducible	05	10%
Total	50	100%

Majority of patients 34 (68%) presented with swelling over the anterior abdominal wall after previous surgery. 15 (32%) patients presented with both pain and swelling.

At the time of admission majority of patients 45(90%) had reducible hernia while 5 (10%) patients presented with irreducible hernia (Table 3).

Table 4: Size of defect of incisional hernia(Detected by USG).

Size of defect (approx.)	Number of cases	Percentage
2cm	2	4%
2.5cm	3	6%
3 cm	11	22%
5cm	28	56%
8cm	2	4%
10cm	2	4%
>10cm	2	4%

Out of 50 patients, 34 patients (68%) were found to have hernial defect more than 3cm and 16 (32%) patients have the defect 3cm or less than 3cm. Size of defect dictated the type of repair (suture repair/mesh repair) in present study.

Most of incisional hernias 14 (28%) occurred following tubal ligation. It is closely followed by Abdominal hysterectomy (24%) and Lower segment cesarean section (22%). 14% patients developed incisional hernia following previous laparotomy for peritonitis (Table 6).

Table 5: Type of repair.

Type of Repair	Number of cases	Percentage
Anatomical (suture repair)	16	32%
Prolene mesh (onlay) repair	34	68%
Total	50	100%

34 (68%) patients undergone onlay prolene mesh repair while anatomical repair was carried out in 16 (32%) patients.

Table 7: Site of previous abdominal incision.

Site of previous abdominal incision	Number of cases	Percentage
Upper midline	10	20%
Lower midline	37	74%
Paramedian	1	2%
Transverse	1	2%
McBurney	1	2%
Oblique/ lumbar	0	0%
Total	50	100%

37 (74%) patients had lower midline incision while 10 (20%) patients had upper midline incision. Paramedian, transverse and McBurney's incision was used in 2% of patients.

Table 6: Previous abdominal surgeries.

Previous abdominal surgery	Number of cases	Percentage
Abdominal hysterectomy	12	24%
Tubal ligation	14	28%
LSCS (lower segment cesarean section)	11	22%
Laparotomies for peritonitis	7	14%
Ventral hernia repair	3	6%
Appendicectomy	2	4%
Cholecystectomy	1	2%
Total	50	100%

In present study 10 patients developed post-operative wound infection which was treated by daily dressing of the wound and IV antibiotics according to culture and sensitivity. In 5 patients seroma was developed which was treated by aspiration with wide bore needle. Hematoma was detected in 2 patients which was treated conservatively.

2 patients developed skin necrosis of margins of the wound which were treated with simple wound debridement along with antibiotics and dressings. 2 patients in anatomical repair group developed recurrence of hernia which was later on treated with prolene mesh Hernioplasty. One patient in mesh repair group developed respiratory distress in post operative period (Table 8).

Average hospital stay in anatomical repair group and prolene mesh repair group noted in present study was 6.18 days and 10.35 days respectively (Table 9).

DISCUSSION

The prevalence of incisional hernia in present study was 11.96% which was higher as compared to Kumar SJG et al and Parekh JN et al series.^{11,12} In a study conducted by Kondreddy S et al, the prevalence of incisional hernia was 24.50%.¹³ This figure is high as compared with present study. The most commonly affected age group in our study was 31 to 50 years. These findings are in accordance with the studies conducted by and Akruwala SD et al, Saeed KA et al, and Rasool M et al studies.¹⁴⁻¹⁶ Female to male ratio in our study was 4.5:1. Similar observations were reported in various other studies.¹⁴⁻¹⁸ The gender discrepancy with females outnumbering males seen in our study may be because of multiple child births in females which leave the abdominal wall weak predisposing them to incisional hernia.

Majority of patients in present study presented with abdominal swelling in the vicinity of previous operative scar. This finding is consistent with the study conducted by Kondreddy S et al.¹³ In present study, majority (74%) of the incisional hernias occurred following lower midline incisions. The findings in present study are comparable with various other studies.^{11-13,19} Higher

incidence of incisional hernia in lower midline incision may be due to absence of posterior rectus sheath below arcuate line in lower abdomen. Intraabdominal hydrostatic pressure is higher in lower abdomen as compared to upper abdomen in erect position i.e. 20cm of water and 8cm of water respectively.

Table 8: Complications in anatomical and mesh repair group.

	Anatomical repair (suture repair) (N=16)		Mesh repair (onlay) (N=34)		
Complications	No. of cases	Percentage	No. of cases	Percentage	P value
Wound infection	4	25%	6	17.64%	0.54186
Seroma	1	6.25%	4	11.76%	0.54186
Hematoma	1	6.25%	1	2.91%	0.5754
Sinus formation	1	6.25%	2	5.88%	0.9601
Skin necrosis	0	0.00	2	5.88%	0.3221
Respiratory complications	0	0.00%	1	2.91%	0.4902
Recurrence	2	12.5%	0	0.00%	0.03572
Mortality	0	0.00%	0	0.00%	-

Table 9: Average hospital stay in anatomical and
mesh repair group.

Type of repair	Average hospital stay
Anatomical repair	6.18 days
Prolene mesh repair	10.35 days

In present study, majority of incisional hernias (60%) appeared within 2 years following index surgery. This finding is in contrast with Kondreddy K et al and Bhmare et al study where majority of incisional hernias occurred within one year following previous surgery.^{13,19} In Saeed KA et al study and Narayanswamy T et al study majority of incisional hernias appeared 5 years after index surgery.^{15,17}

Overall wound infection rate in our study was 20% which is high as compared with Tulaskar N et al study and Nanjappa N et al study.^{18,20} This may be due to small sample size in present study. Wound infection rate in present study is comparable with Kondreddy S et al study.¹³ As compared to Bhat N et al study wound infection rate is less in present study.⁴ As compared to Kadum SG et al, Machiras A et al, Memon W et al study the wound infection rate is higher in present study.²¹⁻²³ Wound infection rate is higher in emergency operated cases and this could be attributed to the lack of preoperative preparation and possibility of making larger incisions in emergency situation. The overall recurrence rate noted in our study is 4%. The recurrence rate observed in Alhamdani AK et al, de Vries RTS et al study and Jacobus WA et al study is 9.25%, 28.3% and 32% respectively.24-26 The recurrence rate varies in different studies. In present study, during study period 2 cases of anatomical repair showed recurrence while

recurrence was not observed in a mesh repair group. But this does not reflect the real recurrence rate as the follow up period was short and variable in present study. The mean follow up period observed in present study was 10 months and incisional hernias are known to occur after this period also.

CONCLUSION

Incisional hernias occur more commonly in females than males. Wound infection in the post operative period was the most common risk factor for incisional hernia. Recurrence rate is more in emergency operated cases. Polypropylene mesh repair is superior to anatomical repair as it has less recurrence rate. Proper preoperative preparation of the patients with high risks (diabetes mellitus, COPD, obesity etc.) is an important factor in preventing recurrence of incisional hernia. As lower midline incisions are more prone for incisional hernia their use should be restricted whenever possible. Meticulous aseptic technique and careful closure of the abdominal wound is necessary to prevent post-operative wound infection and subsequent incisional hernia formation.

Funding: No funding sources Conflict of interest: None declared Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

 Mudge M, Hughes LE. Incisional hernia: A 10 year prospective study of incidence and attitudes. Br J Surg. 1985;72:70-1.

- 2. Williams NS, Bulstrode CJ, Oconnell PR, Bailey and Loves, short practice of surgery. Abdominal wall hernia. 25th ed. ARNOLD, UK, 2008: 986-989.
- Korenkov M, Paul A, Sauerland S, Neugebauer E. Classification and surgical treatment of incisional hernia. Results of an experts' meeting. Langenbecks Arch Surg. 2001;386:65-73.
- 4. Bhat N, Zadie S, Riyad M, Bukhari S. Clinical profile and management of incisional hernias. Internet J Surg. 2009:26(1):1-9.
- 5. Sanders DL, Kingsnorth AN. The modern management of incisional hernias. BMJ. 2012;344:e2843.
- 6. Sanders DL, Kingsnorth AN. From ancient to contemporary times: a concise history of incisional hernia repair. Hernia. 2012;16:1-7.
- Sanders RJ, DiClementi D. Principles of abdominal wound closure. II. Prevention of wound dehiscence. Arch Surg. 1977;112:1188-91.
- Anthony T, Bergen PC, Kim LT, Henderson M, Fahey T, Rege RV. Factors affecting recurrence following incisional herniorrhaphy. World J Surg. 2000; 24:95-101.
- 9. Eypasch E, Paul A. Abdominal wall hernias: epidemiology, economics and surgical technique- an overview. Zentralbl Chir. 1997;122:855-8.
- Flum DR, Harvath K, Koepsell T. Have outcomes of incisional hernia repair improved with time? A population-based analysis. Ann Surg. 2003;237:129-35.
- Kumar SJG, Kumar UK, Manangi M, Madhu KP, Arun BJ. Incisional hernia: incidence, clinical profile, risk factors and prevention. Int Surg J. 2016;3:1292-5.
- 12. Parekh JN, Shah DB, Thakore AB. Incisional hernia; A study of 76 cases. Ind J Surg. 1988;49-53.
- 13. Kondreddy S, Rigved N. Incisional hernia- a prospective study of 50 cases for 1 year. Indian J Appl Res. 2014;4(5):403-7.
- 14. Akruwala SD, Sharma VM, Study of incisional hernia repair by preperitoneal meshplasty. Nat J Med Res. 2013;3(4):328-31.
- 15. Saeed KA. Incisional hernia, risk factors, management and relation to surgical abdominal Incisions. IOSR J Dent Med Sci. 2015;14(11):41-5.

- Rasool M, Saleem MS, Tabassum SA, Pansota MS. Incisional hernia repair: comparison of results with mesh repair and suture repair. Ann Pak Inst Med Sci. 2012;8(2):106-9.
- 17. Narayanaswamy T, Venugopal K, Nikshita N. Clinical study and management of incisional hernias: our experience. J Evol Med Dent Sci. 2013;2(47):9112-8.
- Tulaskar N, Nichkaode P, Dasgupta S, Gurjar G, Umalkar R. Clinical study and management of incisional hernia by onlay or preperitoneal mesh repair: a prospective study in rural set up. IJBAR. 2013;4(5):328-33.
- 19. Bhamare SD, Pingale ND.A clinical study of incisional hernia. MVP J Med Sci. 2016;3(1):1-6.
- 20. Nanjappa NBA, Mohanty A, Smile Sr. Incisional hernia repair- a clinical study of 30 patients. Int J Cur Res Rev. 2013;5(15):35-41.
- 21. Kadum SG, Almahfooz NA, Alhawaz MH, Taha SA. Outcome of large incisional hernia repair with polypropylene mesh. Bas J Surg. 2009:1-12.
- 22. Machairas A, Misiakos EP, Liakakos T, Karatzas G. Incisional hernioplasty with extraperitoneal onlay polyester mesh. Am J Surg. 2004;70(8):726-9.
- 23. Memon W, Khanzada TW, Samad A, Kumar B. Incisional hernia repair with polypropylene mesh. JPMI. 2009;23(22):159-63.
- 24. Alhamdani KA, Albdri JA, Abd HJ. Open onlay mesh repair for abdominal incisional hernia. Iraqi J Comm Med. 2012;(4);347-51.
- 25. de Vries Reilingh TS, Van Geldere D, Langenhurst B, Dejong D, van der wilt GJ, van GH. Repair of large midline incisional hernias with polypropylene mesh: Comparison of three operative techniques. Hernia. 2004;8(1):56-9.
- 26. Jacbus WA. Surgical management of large incision hernias by an intraperitoneal polypropylene. Surge Gynecol Obstet. 1998;165:204-6.

Cite this article as: Deshmukh SN, Varudkar AS, Chopde AV. Clinical study and management of incisional hernias: a prospective monocenter experience. Int Surg J 2017;4:1657-61.