

Original Research Article

Abdominal incisional hernia: retrospective study

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ABSTRACT

Background: Incisional hernia presents as herniation or protrusion occurring along a prior abdominal scar. It is a known complication of abdominal surgery. They are the second most common type of hernia after inguinal hernias. This study was undertaken to study the incidence and various risk factors leading to incisional hernia.

Methods: It is a retrospective study done in Gandhi Medical College, Bhopal; Department of Surgery during January 2017 to January 2018. All the cases were analyzed in various aspects like age, sex, relative incidence, clinical presentation, nature of previous operation, site of previous scar, precipitating factors like obesity, wound infection, abdominal distension.

Results: The incidence is around 18.5%. Patients in the age group of 30-50 years found to have highest incidence of incisional hernia. Females outnumbered the males with the ratio of 6:1. Incisional hernia was more common in patients with previous history of gynecological operation. Most of the patients presented with incisional hernia in the infra umbilical region.

Conclusions: Incisional hernias can be prevented by avoidance of midline incisions, especially in the infra umbilical region. Mesh repair results in less post-operative complications provided drains are used.

Keywords: Incisional hernia, Incidence, Prevention, Risk factors

INTRODUCTION

Incisional hernias are very common. They are the second most common type of hernia after inguinal hernias. Approximately 4 million laparotomies are performed in the United States annually, 2-30% of them resulting in incisional hernia. Between 100,000 and 150,000 ventral incisional hernia repairs are performed annually in the United States. In India, incisional hernia occurs in 10-20% of patients subjected to abdominal operations.¹ Incisional hernias after laparotomy are mostly related to failure of the fascia to heal and involve technical and biological factors. Approximately 50% of all incisional hernias develop or present within the first 2 years following surgery, and 74% occur within 3 years.

Incisional hernia is defined by the European hernia society (EHS) as “any abdominal wall gap with or

without a bulge in the area of postoperative scar perceptible or palpable by clinical examination or imaging”.² Development of incisional hernia can follow any type of surgical incision, whatever its site or size, even the incision of the laparoscope trocar can cause it.

Incisional hernia is defined as herniation or protrusion of abdominal content in area of previous post-operative scar. Patients presents as bulge in the post-operative period which may vary from 10 days to 2 years. Its incidence is reported as 3 % to 20.6 %. It's incidence is more in mid-line scar and least in lower transverse incision.

The incidence of Incisional hernia is still high, in spite of the great improvement in the techniques and suture materials used for closing the abdominal wall incisions. Many procedures and techniques were described for preventing and repairing incisional hernia; using different

suture materials, suture repair, prosthetic repair, combination of different techniques or laparoscopy.

The cause of occurrence of such unwanted complication is due to failure in wound healing in different fascial planes of surgical wound, in early healing phase which leads to low tensile strength of wound. If left unattended they tend to attain large size and cause discomfort to the patient or may lead to strangulation of abdominal contents. Furthermore, they can incarcerate, obstruct or can cause skin necrosis all of which markedly increase the risk to patient's life. The wound healing in post-operative period depends on factors like suture integrity, nutritional status of patient and presence of microbials in the patient's system.

Risk factors of incisional hernia (IH)

The development of incisional hernia is associated with a number of risk factors which may be related to patient, nature of the primary surgery and biological factors.

The risk factors for the development of incisional hernia include obesity, diabetes, emergency surgery, nutritional status of patient, microbials in the patient's system, chronic obstructive lung disease (COPD), postoperative wound dehiscence, smoking and postoperative wound infection.^{2,3} The old age and male gender are considered as risk factors because wound healing is delayed and collagen synthesis decreased beside the fact that the old age is the age of chronic diseases and malignancies. Obesity, expressed as body mass index (BMI) is a major risk factor of IH.

Co-morbidities: Diabetes mellitus, jaundice, malignancies, chronic lung diseases, prostatism, chronic constipations, as well as heavy lifting are well known risk factors for hernia development by increasing the intra abdominal pressure, delaying healing and delaying collagen synthesis. Other factors which are accountable are as follows:

Type of incision: We have noted that the mid-line tear is more difficult to heal because of lesser tensile strength of linea alba. Still it is used mostly in emergency surgery as quick and speedy approach to abdominal cavity.

Type of surgical procedure: Type of surgical procedure also plays a role as surgeries where there is prolong exposure due to difficulty in approach or excessive blood loss which leads to consequential delayed healing and incisional hernia formation. The nature of the surgical operation; operations in which there is wound contamination (bowel resection or secondary peritonitis), surgery for malignant tumours, stoma closure, major abdominal surgeries and operations followed by open abdomen treatment with negative pressure and delayed primary wound closure, are all risk factors for development of incisional hernia.

The technique of closing the abdominal fascia and suture material used play a major role in developing incisional hernia. Re-laparotomy is strong risk factor. Also, factors related to long operation time, increased blood loss and surgeon experience increase the risk of incisional hernia.

The risks of repairing an incisional hernia which should be explained to the patient when obtaining consent include seroma formation, wound infection, injury to intra-abdominal structures and recurrence. Major complications which can occur in repair of large incisional hernias include mesh infection and enterocutaneous fistula which may result in prolonged morbidity and require re-operation.

Mostly the hernia appear within 0-5 years of post-operative period. After 5 years of surgery, it is less likely. The patient mostly presents as:

- Abdominal bulge at operative site.
- Pain at operation site.
- Abnormal distention of abdomen.
- Discomfort in abdomen.

The above may be due to bowel protrusion, bowel adhesion, which is common in bigger defect; whereas omental protrusion and adhesions are more common in smaller defects. Choice of suture and technique of closure are therefore important predisposing factors to wound failure.¹

Surgical interventions

Mesh repair: One of the established techniques of surgical treatment of the incisional hernia is the prefascial prosthetic im-plantation described by Chevrel (onlay technique).

Use of mesh for abdominal wall reinforcement in incisional hernia was first described in the 1970's by French (35-40) surgeons namely Chevrel, Rives and Stoppa. According to the positioning of the mesh prosthesis, epifascial mesh reinforcement is known as the onlay technique and retromuscular mesh reinforcement as the sublay technique. The onlay technique reinforces the fascial suture by placing a mesh over the fascia. This requires extensive epifascial preparation to ensure sufficient wrapping of the mesh over the fascial defect

Suture method: In suture method defect is repaired using continuous or interrupted suture technique. Recurrence rates of >50% are documented depending on the length of follow-up.

METHODS

It was a retrospective study done in Gandhi Medical College, Bhopal; Department of Surgery during January 2017 to January 2018. Informed consent was taken from patients and patient attenders.

Inclusion criteria

All patients with swelling in previous scar and history of previous surgery.

Exclusion criteria

It includes pediatric age group patients.

Detailed history was taken and general and local examination was made. All the cases were analysed in various aspects like age, sex, parity, relative incidence, clinical presentation, nature of previous operation, site of previous scar, precipitating factors like obesity, wound infection, abdominal distension. The contributory factors like chronic obstructive pulmonary disease, diabetes mellitus, elderly age, chronic constipation and enlarged prostate were particularly look for. While presenting the cases, only relevant and positive findings were recorded in the proforma case sheet enclosed and a master chart

dealing with all the aspects has been designed and presented. The diagnosis was made clinically in all the cases without difficulty. Routine investigations were done to obtain fitness for surgery. Collected data was tabulated and stastically analysed by using SPSS software.

RESULTS

Out of 47 patients in our study, 40 patients were female and 7 were male. The age group of the patients varied from 19 to 80 years. Incidence was highest in the age group ranging from 30 to 50 years. Regarding the occupation of patients, out of 40 females majority of them (32) were house-wives. Most of the patients (22) presented with swelling, followed by pain and swelling in about 13 of them, pain alone in 9 cases and rest (3) with associated symptoms of constipation. Only two out of 47 came with features suggestive of intestinal obstruction (Table 1).

Table 1: Age distribution, sex distribution, method of repair and post-operative complication in the 47 cases with incisional hernia.

Variables		Frequency (n= 47)	Percentage
Age (in years)	15-30	06	12.7
	30-50	21	44.6
	>50	20	42.5
Gender	Male	07	14.9
	Female	40	85.1
Method of repair (meshplasty)	Mesh onlay	45	95.7
	Laparotomy with adhesiolysis with mesh repair.	01	2.1
	Laparotomy with resection-anastomosis with anatomical repair	01	2.1
Time of surgery	Routine	45	95.7
	Emergency	02	4.2
Defect size	Less than 2cm	17	36.2
	2 to 5cm	20	42.5
	>5cm	10	21.2
Complication of surgery	None	38	80.8
	Wound infection	07	14.8
	Hematoma	01	2.1
	Seroma	03	6.3
	Recurrence after 1 year	05	10.6

In our study, 17 patients were found to have hernial defect of up to 2 cms and 10 patients had defects more than 5cms (Table 1). In our study, we had five recurrences; however the follow-up period was variable and short (1 year) to comment upon.

Laparotomy (46%) and lower segment caesarean section (LSCS) (41%) was the commonest operation responsible for the incisional hernia in our study followed by total abdominal hysterectomy (10%) (Table 2).

Table 2: Previous surgery among incisional hernia patients.

Previous surgery	Case	Percentage
Laparotomy	21	44.6
LSCS	19	40.4
TAH	05	10.6
Nephrectomy	01	2.1
Abdominal tubectomy	02	4.2

Table 3: Previous incision among incisional hernia patients.

Incision	Case	Percentage
Lower mid-line	10	21.2
Upper mid-line	02	4.2
Mid-line	25	53
Transverse	09	19.1
Oblique	01	2.1

Incisional hernia was more common after midline incision (53%). Out of the 47 patients studied the commonest incisions responsible, for the hernia were midline (53%) and lower midline (21%) (Table 3).

Nutritional anemia was the commonest co-morbidity amongst the patients (63 %) studied followed by diabetes in 10 patients (21%) (Table 4).

Table 4: Various risk factors associated with incisional hernia.

Associated risk factor	Case	Percentage
Nutritional anemia	30	63.8
Diabetes	10	21.2
COPD	3	6.4
Obesity	4	8.5

DISCUSSION

Incisional hernia is the second most common hernia among all the hernias operated in our institution (18.50%). The maximum age incidence of incisional hernia in our study has been 30-50 years with mean age of 45 years in my study. The youngest patient in my study was 23 years old and oldest was 70 years old. Ellis, Gajraj and George, in their study noticed a mean age of 49.4 years.³ Elderly patients, especially those older than 80 years old, are always associated with several comorbid diseases and higher ASA scores, thus putting these patients at a greater risk of intra- and post-operative complications that are able to favor the formation of the incisional hernia.

The sex incidence of incisional hernia among the 47 cases studied is 1:6 (M:F) approximately showing a female preponderance. Incidence of incisional hernia is more common in females in our country may be because of multiple child births which leave the abdominal wall weak, also an increased incidence of obesity in females. Ellis, Gajraj and George, obtained an incidence of 64.6% female population in their study of 383 patients.³ Shah JB studies and Goel and Dubey series have male to female ratio 1:1.17 and 1:1.25 (M: F) ratios respectively.^{4,5}

Most of the patients (twenty two patients) presented with swelling, followed by both pain and swelling in about thirteen of them, pain alone in nine cases and rest three with associated symptoms of constipation. Only two out

of 47 came with features suggestive of intestinal obstruction.

In this study, 53% of the incisional hernia occurred in midline infra-umbilical incisions. This may be because of the following features:

- Intraabdominal hydrostatic pressure is higher in lower abdomen compared to upper abdomen in erect position i.e., 20 cm of water and 8 cm of water respectively.
- Absence of posterior rectus sheath below arcuate line.
- This incision is used in gynecological surgeries who have poor abdominal wall musculature.

This is comparable with Thakore AB et al, studies (67.1%) and Goel and Dubey studies (44.6%).^{4,5} Over 55% of cases occurred following gynecological procedures (hysterectomy, tubectomy, caesarean sections). This may be because most of these procedures were done through lower midline incisions. Ponka, in his study noted 36% incidence and Goel and Dubey noted 28.76% incidence among gynecological procedures.^{5,6}

In considering risk factors promoting incisional hernia, nutritional anemia and wound infection are the commonest. This is comparable with that of JN Parekh studies.⁷ The other risk factors observed were obesity (8.5 %) and COPD (6.5%). This is comparable with that of Bose et al, studies in which wound infection (59 out of 110 patients=53.63%), obesity (33/110 =30%), COPD (23/110 = 20.90%) and stricture urethra (10/110 = 9.09%).⁸ In this study, four patients (8.5 %) had undergone more than one operation previously which is also one of the risk factors. Brenden Devlin, states that repeated wounds in the same region or just parallel to each other will often lead to the development of herniation.⁹

During the clinical examination in our study 17 patients were found to have hernial defect of up to 2 cms and 10 patients had defects more than 5cms. Santora TA et al, believes that the size of the fascial defect and the appearance of the fascia should dictate the selection of the most appropriate method of hernia repair. Abrahamson J, believes that mesh repair is excellent method of repair for large ventral abdominal hernias but has not specified the size of the defect.¹⁰

In this 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 hernial defect, abdominal muscle tone, whether hernial defect could be approximated without tension and general condition of the patient.

Santora et al, reported proper preoperative preparation of the patients with high risk is an important factor in preventing recurrence of incisional hernia and use of

suction drains in mesh repair decreases the postoperative complications.¹¹ Khaira HS et al, reported seroma formation in 6 out of 35 patients and wound infection in 1 out of 35 patients.¹² In this study, we had five recurrences but follow-up period was short to comment upon. Usher reported zero percent recurrence in 48 patients who were treated by polypropylene mesh repair.¹³ Jacobus WA et al, reported a 10 year cumulative rate of recurrence of 63% in anatomical repair and 32% in mesh repair.¹⁴ The recurrence rate thus varies in different studies but all studies favour mesh repair to decrease the recurrence rate. Prevention of wound infection and wound dehiscence by using appropriate prophylactic antibiotics and suitable techniques is known to reduce the incidence of incisional hernia.^{15,16}

With thorough patient evaluation, pre operative skin preparation, meticulous operative technique, use of non absorbable sutures for musculo-aponeurotic tissue, use of suction drain, use of peri-operative broad spectrum antibiotics, nasogastric aspiration, early ambulation and chest physiotherapy, complication rates in our study were minimized. With prosthetic mesh, defects of any size can be repaired without tension. The polypropylene mesh, by inducing inflammatory response sets up scaffolding that in turn induces the synthesis of collagen. Thus, the superiority of mesh repair over suture repair can be accounted for.

CONCLUSION

Incisional hernia is one of the most prevalent complications of abdominal surgery and frequently causes morbidity which rises healthcare costs. Incisional hernias are iatrogenic and preventable by avoidance of midline incisions, especially in the infra umbilical region. Incisional hernia was more common in patients with previous history of gynecological operation. Proper preoperative preparation of the patients with high risk is as important in preventing recurrence. Mesh repair results in less post operative complications for incisional hernia provided drains are used.

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REFERENCES

1. Bucknall TE, Cox PJ, Ellis H. Burst abdomen and incisional hernia: A prospective study of 1129 major laparotomies. *British Medical J.* 1982;284:931-3.
2. Muysoms FE, Miserz M, Benevoet F, Campanelli G, Champault GG, Chelala E et al. Classification

- of primary and incisional abdominal wall hernias. *Hernia.* 2009;13(4):407-14.
3. Ellis H, Gajraj H, George CD. Incisional hernias-when do they occur? *Br J Surg.* 1983;70:290.
4. Shah JB. Incisional hernia-a study of 50 cases. *Indian J Surg.* 1977;39:353-56.
5. Goel TC, Dubey PC. Abdominal incisional hernia-Anatomical technique of repair. *Indian J Surg.* 1981;43:324-27.
6. Ponka JL, *Hernias of the abdominal wall.* Philadelphia, PA: WB Saunders;1981.
7. Parekh JN, Shah DB, Thakore AB. Incisional hernia-a study of 76 cases. *Indian J Surg.* 1988;50:49-53.
8. Bose SM, Lal Roshan, Kalra Manju, Wig JD, Khanna SK. Ventral hernia-a review of 175 cases. *Indian J Surg.* 1999;61(3):180-84.
9. Devlin HB, Kingsmith HB. Abdominal wall and hernias. Chapter 10th in *A new aids companion in surgical studies*, 2nd ed. Keim GB Lunard, Edingburgh Churchill Livingstone;1998:688-99.
10. Jack A. "Hernias" Chapter 14th In: Zinner MJ, Schwartz S, Ellis H, Editors. *Maingot's Abdominal Operations.* 10th ed. Connecticut: Prentice hall international Inc. 1997;1:479.
11. Santora A, Thomas G. Incisional hernia. *Surgical Clinics North America.* 1993;73(3):557-68.
12. Khaira HS, Lall P, Hunter B, Brown HJ. Repair of incisional hernias. *J R Coll Surg Edin.* 2001;46:39-43.
13. Usher FC, Oschner J, Tuttle LLD Jr. Use of marlex mesh in the repair of incisional hernia. *Am J Surg.* 1958;24:969.
14. Burger JW, Lujendijk RW, Hop WC, Halm JA, Verdaasdonk EG, Jeekel J. Long-term follow-up of a randomized controlled trial of suture versus mesh repair of incisional hernia. *Annals of surgery.* 2004 Oct;240(4):578.
15. Müller-Riemenschneider F1, Roll S, Friedrich M, Zieren J, Reinhold T, von der Schulenburg JM, et al. Medical effectiveness and safety of conventional compared to laparoscopic incisional hernia repair: a systematic review. *Surg Endosco.* 2007;21(12):2127-36.
16. Justinger C, Silota JA, Schilling MK. Incisional hernia after closure with slowly absorbable versus fast absorbable antibacterial coated sutures. *Surgery.* 2012;15(3):398-401.

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