

Original Research Article

A study of incisional hernia - Evaluation of risk factors and outcome of various surgical techniques used in the incisional hernia repair

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Abstract

Background: 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, a combination of different techniques or laparoscope.

Aim and objective: To develop a strategy for effective management of Incisional Hernia by studying the outcomes of various techniques in the incisional hernia repair.

Materials and methods: All the patients were evaluated by a proper history and detailed physical examination. Data collected by proforma. All patients underwent routine blood investigations and in our study. Ultrasound abdomen was done for all our patients to know the size, number of defects, contents and any other abdominal Pathology.

Results: During previous surgery, Suprapubic incision was done for 26 patients (52%) and Midline incision for 24 patients (48%). This showed that all the incisions in the abdominal wall prone to incisional hernia without much difference. Drain removal was done after five days for 34 patients (68%) and within five days for 16 patients (32%). This showed the duration of stay increased in onlay mesh repair due to delayed drain removal. In the present study, postoperative complications of onlay and sublay were compared. Seroma rate was 39%, wound infection was 20%, wound dehiscence was

22%, secondary suturing was done in 19% of the patients. From this, sublay repair was having a minimal number of complications.

Conclusion: Evaluating outcomes of onlay and sublay surgical techniques, preperitoneal sublay repair was found to have better patient compliance and satisfaction with regard to the occurrence of complications. The preperitoneal sublay repair procedure can easily be performed.

Key words

Incisional Hernia, Suprapubic incision, Seroma rate, Drain removal.

Introduction

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 [1]. 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 [2]. Many procedures and techniques were described for preventing and repairing Incisional Hernia; using different suture materials, suture repair, prosthetic repair, a combination of different techniques or laparoscope [3]. In spite of the many efforts for reducing the incidence of Incisional hernia, still, there is a lack of consensus regarding the best approach for preventing and repairing Incisional Hernia, because most of them are followed by complications [4]. Incisional Hernia represents a major surgical issue for surgeons of all specialties [5]. The aim of the present article is to review the risk factors and management of the Incisional hernia and its complication.

Materials and methods

This prospective comparative analytical study was done from patients who consented to get operated for Incisional Hernia at Madras Medical College and Rajiv Gandhi Government General Hospital, from February 2017 to September 2017 over a period of 8 months.

Inclusion criteria: Patient who give informed written consent, All patients with Incisional Hernia between 18 to 70 years, Both the sexes.

Exclusion criteria: Patient unfit for surgery, Recurrent Incisional Hernia, Emergency surgery

for Incisional Hernia, Pregnancy with Incisional Hernia.

Sample size: 50 patients.

Procedure: Data were collected in a specially designed case recording Proforma (CRF) pertaining to the patient's particulars, proper history, clinical examination, investigations, diagnosis and surgical procedures. It was then subjected to statistical analysis with the help of the biostatistician of our institute. All the surgical procedures and medical management and investigations were conducted under direct guidance and supervision of our guide. Before the start of our study, a written/informed consent was obtained in local vernacular language from each patient.

Preoperative Evaluation: All the patients were evaluated by a proper history and detailed physical examination. Data were collected by proforma. All patients underwent routine blood investigations and in our study. Ultrasound abdomen was done for all our patients to know the size, number of defects, contents and any other abdominal Pathology.

Preoperative preparation: Patients were kept NPO for about 6 to 8 hours. All patients were received prophylactic antibiotics half an hour before surgery.

Patient position - the patient was in a supine position without any tilt.

Position of the surgical team - The operating surgeon was stand to the right of the patient with the assistant on his left.

Procedure for open surgery: Almost all patients were operated under general anesthesia. Foley's catheterization and nasogastric tube were

used. Patients were placed in supine position skin incision was made according to the site and size of the defect. The hernia sac was detected out and reduced and the defect assessed. When there were adhesions, the sac were opened and contents were reduced. In onlay repair polypropylene mesh was sutured over the anterior rectus sheath, while in sublay technique mesh was placed under retro-rectus muscle position. A suction drain was placed, skin and subcutaneous tissue closed in layers. Mesh used Polypropylene mesh.

Post-operative: During the postoperative period, all patients received intravenous aqueous diclofenac injections 12th hourly for 1 day unless contraindicated and thereafter oral analgesics were given on the patient demand. All the patients were ambulated within 12 hours of surgery and are encouraged for oral feeds. Initially, the feeds were sips of liquids followed by normal diet after the resolution of postoperative ileus (indicated by passing of flatus and normal bowel sounds on auscultation and return of appetite). In patients with persistent ileus, they were kept NPO and whenever required a nasogastric tube was passed only to be removed with a resolution of ileus. The wounds were inspected for any seroma, hematoma or any infections. In the open group, drains were removed when the collection was less than 30 ml for 2 consecutive days. Patients were discharged after complete ambulation and tolerating a normal diet.

Statistical analysis

The Statistical software namely SAS 9.3, SPSS 15.0 were used for the analysis of the data and Microsoft Word and Excel had been used to generate graphs, tables, etc.

Results

In our study, most of the patients were more than 60%, underwent incisional hernia surgery between the age of 30 to 50 years. Of these, most of the patients were in the age group of 30 to 40 years. This showed most of the patients were in

the middle age group. In our study, out of the fifty patients in incisional hernia repair, 10 patients (20%) were male while 40 patients (80%) were female. These showed females were more prone to incisional hernia. In our study, most of the patients undergone previous surgery under the age of 30 years (48%). 13 patients (26%) were between 30 to 40 years of age. The rest 13 patients (26%) were above 40 years of age. This showed that the patients undergone surgery in the young age group were prone to incisional hernia (**Table – 1**).

Table - 1: Age distribution.

Age (Years)	No. of patients
<30 yrs	2
30-40 yrs	20
40-50 yrs	13
50-60 yrs	8
>60 yrs	7
Total	50

Table – 2: Type of incision in previous surgery.

Incision	No of patients
Suprapubic	26
Midline	24

Table – 3: Type of incisional hernia repair done.

Repair	No of patients
Onlay	25
Sublay	25

Table – 4: Drain removal.

Drain removal	No. of patients
<5days	16
>5days	34

During previous surgery, Suprapubic incision was done for 26 patients (52%) and Midline incision for 24 patients (48%). This showed that all the incisions in the abdominal wall prone to incisional hernia without much difference. Many of the patients were having a history of previous wound infections in previous surgery noted in our study (**Table – 2, 3**).

Graph – 1: Post-operative complications of incisional hernia repair.

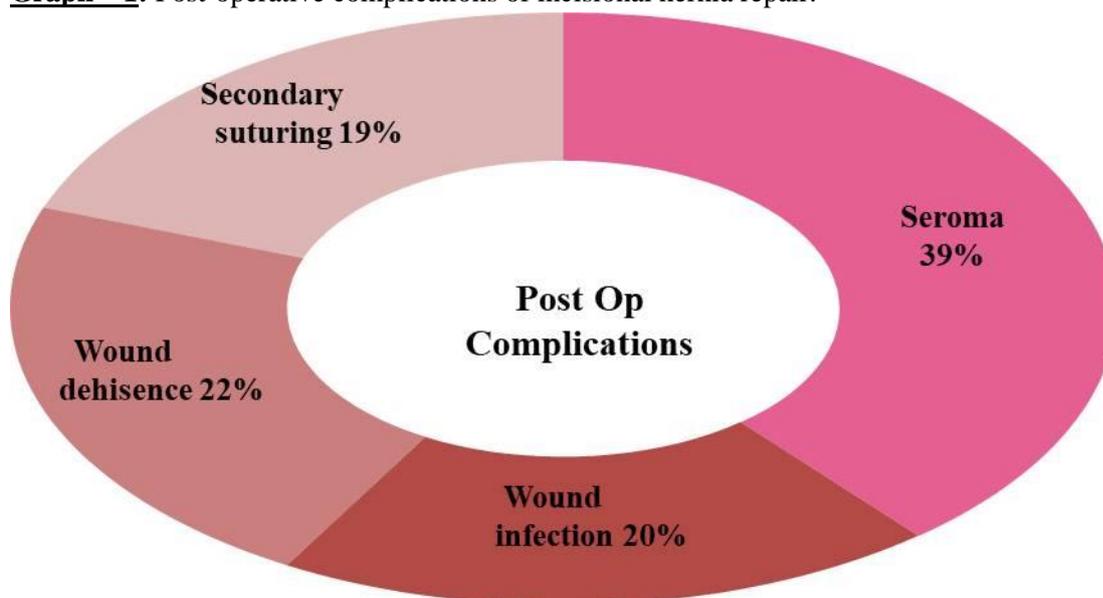


Table – 5: Seroma.

		Seroma		Total	P value
		Absent	Present		
Repair	Onlay	14	11	25	0.012(S)
	Sublay	22	3	25	
Total		36	14	50	

Drain removal was done after five days for 34 patients (68%) and within five days for 16 patients (32%). This showed the duration of stay increased in onlay mesh repair due to delayed drain removal (Table – 4). In the present study, postoperative complications of onlay and sublay were compared as per Graph - 1. Seroma rate was 39%, wound infection was 20%, wound dehiscence was 22%, secondary suturing was done in 19% of the patients. From this, sublay repair was having a minimal number of complications (Table – 5).

Discussion

The standard procedure for incisional hernia is the implantation of prosthetic mesh. Various studies have concluded that mesh repair is superior to suture repair which has an 85% higher recurrence risk compared to mesh repair [6]. This can be done using various techniques like onlay mesh repair, sublay mesh repair and laparoscopic mesh repair. The onlay technique involves primary closure of the fascial defect and

subsequent reinforcement by placing the prosthetic mesh on top of the fascial repair and securing the mesh to the anterior rectus sheath with sutures or facial staplers [7]. The major advantage is that the mesh is separated well away from the intra-abdominal contents reducing complications. This technique has several disadvantages like an extensive dissection of the subcutaneous plane which leads to seroma collection, mesh infection in superficial wound breakdown, primary repair under tension and, hence, the presence of more risk of recurrence [8]. The sublay technique includes the placement of prosthetic mesh being placed preperitoneal in the recto-rectus muscle space. This preperitoneal technique has less recurrence rate and postoperative wound complications as supported by a study from a randomized, controlled trial which showed that the onlay technique was associated with five times higher recurrence rates and twice the rate of postoperative wound complications when compared with placing the mesh in a sublay fashion [9]. In our study, most

of the patients more than 60%, underwent incisional hernia surgery between the age of 30 to 50 years. Of these, most of the patients are in the age group of 30 to 40 years. This shows most of the patients are in the middle age group. [10] In our study, out of the fifty patients in incisional hernia repair, 10 patients (20%) are male while 40 patients (80%) are female [11]. This shows females are more prone to incisional hernia. In our study, most of the patients undergone previous surgery under the age of 30 years (48%). 13 patients (26%) were between 30 to 40 years of age [12]. The rest 13 patients (26%) were above 40 years of age. This shows that the patients undergone surgery in the young age group are prone to incisional hernia [13]. Many of the patients are having a history of previous wound infection in previous surgery noted in our study. Drain removal was done after five days for 34 patients (68%) and within five days for 16 patients (32%) [14]. This shows the duration of stay increased in onlay mesh repair due to delayed drain removal. In the present study, postoperative complications of onlay and sublay compared [15]. Seroma rate is 39%, wound infection is 20%, wound dehiscence is 22%, secondary suturing done in 19% of the patients. From this, sublay repair is having a minimal number of complications [16].

Conclusion

A study consisting of 50 patients who underwent incisional hernia repair by onlay and sublay method in Madras Medical College and evaluating outcomes of onlay and sublay surgical techniques, preperitoneal sublay repair was found to have better patient compliance and satisfaction with regard to the occurrence of complications. The preperitoneal sublay repair procedure can easily be performed by a surgeon with proper guidance and has a short learning curve.

References

1. Adrian E, Winter DC, Metcalf DR, Wolff BG. Perineal hernia after proctectomy: prevalence, risks, and

- management. *Dis Colon Rectum*, 2006; 49(10): 1564-1568.
2. Antoniou GA, Georgiadis GS, Antoniou SA, Grandrath FA, Giannoukas AD, Lazarides MK. Abdominal aortic aneurism and abdominal hernia a manifestation of connective tissue disorder. *J Vasc Surg.*, 2011; 54(4): 1175-1181.
3. Bellon JM, Duran HJ. Biological factors involved in the genesis of incisional hernia. *CirEsp.*, 2008; 83(1): 3-7.
4. Beltran MA, Cruces KS. Incisional after McBurney's incision. Retrospective case-control study of risk factors and surgical treatment. *World J Surg.*, 2008; 32(4): 596-601.
5. Bensley RP, Schermerhorn ML, Hurks R, Sachs T, Boyd CA, O'Malley AJ, et al. Risk of late-onset adhesion and incisional hernia repair after surgery. *Am J Surg.*, 2013; 216(6): 1159-1167.
6. Bhangu A, Nepogodiev D, Futaba K. Systematic review and meta-analysis of the incidence of incisional hernia at stoma closure. *World J Surg.*, 2012; 36(5): 973-983.
7. Brandl A, Laimer E, Perathoner A, Zitt M, Pratschke J, Kafka-Ritsch R. Incisional hernia rate after open abdomen treatment with negative pressure and delayed primary fascial closure. *Hernia*, 2014; 18(1):105-111.
8. Brewer MB, Rada EM, Milburn ML, Goldberg NH, Singh DP, Cooper M, et al. Humalacclular dermal matrix for ventral hernia repair reduces morbidity in transplant patients. *Hernia*, 2011; 15(20): 141-145.
9. Flum DR, Horvath K, Koepsell T. Have outcomes of incisional hernia improved with time? A population-based analysis. *Ann Surg.*, 2003; 237(1): 129-135.
10. Gislason H, Viste A. Closure of burst abdomen after the major gastrointestinal operation – comparison of deferent surgical technique and later development of an incisional hernia. *Eur J Surg.*,

- 1999; 165(10): 958-961.
11. Houck JP, Rypins EB, Sarfeh IJ, JulerGL, Shimoda KJ. Repair of incisional hernia. *Surg Gynecol Obstet.*, 1989; 169(5): 397-400.
 12. Janssen H, Lange R, Erhard J, Malagó M, Eigler FW, Broelsch CE. Causative factors, surgical treatment and outcome of incisional hernia after liver transplant. *Br J Surg.*, 2002; 89(8): 1049-1058.
 13. Jargon D, Friebe V, Hopt UT, Obermaier R. Risk factors and prevention of incisional hernia- What is evidence-based. *ZentralblChir.*, 2008; 133(5): 453-457.
 14. Koivukangas V, Oikarinen A, Risteli J, Haukipuro K. Effect of jaundice and its resolution on wound re-epithelization, skin collagen synthesis and serum collagen peptide levels in patients with neoplastic pancreaticobiliary obstruction. *J Surg Res.*, 2005; 124(2): 237-243.
 15. Kulacoglu H, Ozluna O. Growth and trends in a publication about incisional wall hernias and the impact of the specific journal on herneology: a bibliometric analysis. *Hernia*, 2011; 15(6): 615-628.
 16. Lamont PM, Ellis H. Incisional hernia in reopened abdominal incisions; an overlooked risk factor. *Br J Surg.*, 1988; 75(4): 374- 376.