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Original Research Article

Open mesh repair, is still a standard technique for incisional hernia: a comparision study between sublay and onlay technique in the era of laparoscopy

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ABSTRACT

Background: Incisional hernia (IH) remains a very frequent postoperative complication and common hernias in middle aged population more commonly in females. The two techniques most frequently used are the onlay repair and sublay repair. Various studies have been conducted to compare the advantages and disadvantages of sublay and onlay mesh repair in incisional hernia and the superiority of sublay mesh repair. These studies whether they hold good for the population is a pertinent question. In view of this, author need to study the appropriate surgical techniques sublay versus onlay repair in the set up.
Methods: Author conducted randomized comparative study of 100 patients having incisional hernia admitted to various surgical units of SNMC and HSK Hospital, Bagalkot during the period December 2014 to June 2016.
Results: In present study of 100 cases, females have more incidence of incisional hernias than males. In onlay technique seroma formation was found in 72% of patients postoperatively and 4% in sublay technique. Surgical site infection (SSIN) was noticed in 8% of sublay technique whereas 12% in onlay technique. There is no recurrence in sublay group whereas onlay had 12% recurrence.
Conclusions: Sublay technique is superior to onlay concerning the hospital stay, complications and recurrence.

Keywords: Incisional hernia, Laparoscopy, Onlay mesh, Sublay mesh

INTRODUCTION

Incisional hernia (IH) remains one of the most frequent postoperative complications after abdominal surgery, with incidences ranging from 11% to 20%.[1,2]

Each mesh location has its theoretical risks and benefits. With onlay repair, skin flaps must be created, which increase the risk of wound complications and mesh infection.[3] However, onlay repair is technically easy to perform. In addition, for large complex hernias, this space is often already dissected with excision of the hernia sac or with myo-fascial release.

Sublay repair is often considered more challenging and complex to perform. Dissection of this plane can risk damaging the muscles, blood supply, and nerves to the rectus abdominal. In addition, this mesh location may not be appropriate for off midline defects. However, this space potentially protects the mesh from both superficial wound complications and intra- peritoneal contents. In addition, it also allows for load bearing tissue in growth from two directions.[4]

Laparoscopic incisional hernia repair, the major obstacles to success is mesh fixation which is achieved either with staples and tackers or through and through sutures to ensures secure peripheral fixation. The learning curve for the operation can be quite long and hazardous.[5]

However, no consensus has been reached as to which technique is preferable. The anatomic position of the mesh placement has an impact on tissue incorporation, tissue reaction, and tensile strength of the abdominal wall.[6-8] These factors are important regarding IH recurrence and postoperative complications.

This prospective study looks into the advantages and disadvantages involved in sublay and onlay mesh repair in incisional hernia using nonabsorbable polypropylene mesh.

METHODS

Randomised prospective comparative study performed on patients having incisional hernia between 15 to 65 years age group admitted to various surgical units of SNMC and HSK Hospital, Bagalkot during the period December 2014 to June 2016 with 100 cases with 50 randomly selected cases in each sublay and onlay group.

Exclusion criteria was recurrent hernias, incisional hernia with complications like irreducibility, obstruction, strangulation, incarceration, and associated umbilical and paraumbilical hernias and patients medically unfit for surgery. Explained written consent and ethical clearance taken from institute.

The meshes used to repair the hernias were sized to allow 6-8cm of excess prosthesis in all directions from the abdominal defects and sutured to underlying fascial structures using polypropylene sutures. Polypropylene mesh was the preferred prosthetic material. Patients received a single dose of third generation cephalosporins at the time of surgery and continued for three to five days. Two suction drains were placed between fascial layers, which were removed postoperative when drainage was less than 10ml.

Patients were discharged when they were fully mobile and surgical team were satisfied that they were no immediate complications. Follow up in outpatient clinic was initially every 15 days and then 3 monthly depending on clinical course. Data is tabulated in and analysed using SPSS software 11.

RESULTS

In present study incisional hernia were repaired by onlay and sublay techniques (50 each respectively) author found the mean age group of patients was 31 to 40 years and more incidence of incisional hernia in females than males. In present study post tubectomy surgery is the commonest cause for incisional hernia followed by ceasarian section and laparotomy. Mean surgical time was 90 - 120 mins for onlay technique and 90 -150 mins for sublay technique.

Postoperative hospital stay

In present study in sublay group 54% have a stay between 1-7 days whereas in onlay group only 10% of the patients have a stay of 1-7 days. 2% in sublay group and 30% in onlay group have a hospital stay between 8-21 days. This shows sublay technique to be the better method in view of less duration of hospital stay.

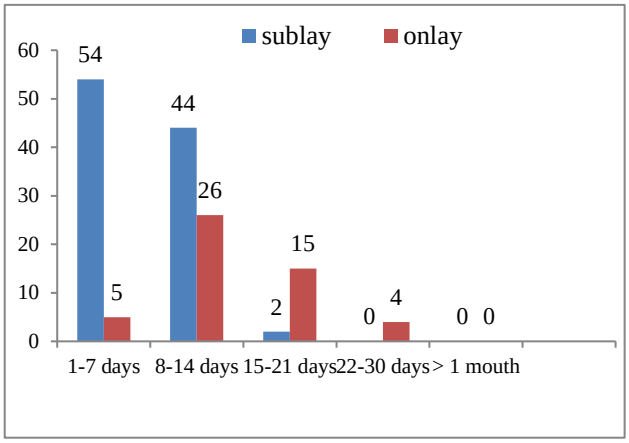

Figure 1: Duration of stay in the hospital.

Postoperative complications

Complications of incisional hernia surgery recorded for this study are those related to surgical site infection (SSIN), seroma, recurrence. In sublay group 44 patients (88%) were discharged without any complications, whereas in onlay group only 2 patients (4%) discharged without any complications. In present study onlay group has developed seroma in 36 (72%) patients postoperatively but sublay group had only 2 patients (4%). Surgical site infection (SSIN) was found in 12% (6patients) in onlay group whereas in sublay group was 8% (4 patients). There was no recurrence of incisional hernia in sublay group and 12% (6 patients) in onlay group. In view of duration of hospital stay, postoperative complications and recurrence. Author consider sublay technique repair for incisional hernia is superior over onlay technique.

Table 1: Postoperative complications in incisional hernia repair.

	Sublay	Onlay
Postoperative complications	n = 50	n = 50
Nil complications	44 (88)	02 (4)
Seroma	02 (4)	36 (72)
Surgical site infection	04 (8)	06 (12)
Recurrence	Nil	06 (12)
Other	Nil	Nil

DISCUSSION

Multidisciplinary teams of surgeons undertaking repair of complex abdominal incisional hernias should be conversant with the different methods of placement of prosthetic materials and able to deploy the techniques of abdominal components separation, tissue expansion, local and distant muscle flaps, free tissue transfer and vacuum assisted closure.[9] The size of the prosthesis used to repair incisional hernias is important; it should cover any residual defect plus an additional 6-8cm in all directions from the margins of the hernial aperture and suture intervals should be no more than 2cm to ensure adequate fixation.[10]

In present study the maximum incidence of incisional hernia was seen in post tubectomy surgery with 50% in sublay and 38% in onlay group. This was followed by 20% post caesarian section in sublay group and 36% in post laparotomy in onlay group. The maximum age group noticed in 31-40 yrs (36% in sublay and 48% in onlay) with incidence more in females (94% in sublay and 68% in onlay). The gender incidence ratio in sublay is female:male 18:1 and 2:1 in onlay.

Table 2: Comparative study characteristics.

Author	Number	Mesh location	Recurrence (%)	SSIN (%)	Seroma (%)
Venclauskas et al	107	Ol (57)	Ol:6 (10.5)	Ol:8(14.3)	Ol:26(41.1)
		Sl (56)	Sl :1 (2.0)	Sl: 1(2)	Sl :12(11.2)
Kumar et al	63	Ol (45)	Ol :4 (22.4)	Ol:6(13.3)	Ol : 0
		Ul (18)	Ul :1 (5.6)	Sl:2(11.1)	Sl : 0
Weber et al	550	Ol (181)	Ol :22 (12.2)		
		ISl (369)	Sl :53(14.4)	-	-
Abdollahi et al	354	Ol (33)	Ol :2 (6.1)	Ol : 1(3.0)	-
		Sl (312)	Sl :2 (0.6)	Sl : 7(2.2)	
		Ul (9)	Ul :0	Ul : 0	
Present study	100	Ol (50)	Ol : 6(12)	Ol : 6(12)	Ol : 36 (72)
		Sl (50)	Sl : Nil	Sl : 4(8)	Sl : 02(4)

SSIN- Surgical site infection, Ol- Onlay, Sl- Sublay, Ul- Underlay

In present study, onlay group has developed seroma in 36 (72%) patients postoperatively but sublay group had only 2 patients (4%) seroma formation. In sublay group 44 patients (88%) discharged without any complications, whereas in onlay group only 2 patients (4%) discharged without any complications. Surgical site infection(SSIN) was found in 12% (6patients) in onlay group whereas in sublay group was 8% (4 patients). There was no recurrence of incisional hernia in sublay group and 12% (6 patients) in onlay group. In sublay group maximum hospital stay was 1-7 days (54%), where as in onlay group maximum hospital stay was 8-14 days (52%). So, hospital stay was prolonged in onlay mesh repair patients in view of complications. In view of duration of hospital stay, postoperative complications and recurrence. Author consider sublay technique repair for incisional hernia is superior over onlay technique.

Kumar et al studied 63 patients and noticed SSIN in 6 patients (13.3%) in onlay group and 2 patients (11.1%) in sublay group, with recurrence rate of 4 patients (22.5%) in onlay group and 1 patient (5.6%) in sublay group respectively which is almost comparable to present study.[11]

Venclauskas L et al conducted a study on 107 patients and noticed surgical SSIN in 8 (14.3%) patients in onlay group, 1 patient (2%) in sublay group, seroma formation in 26 patients (41.1%) in onlay group and 12 patients (11.2%) in sublay group with recurrence rates of 10.5% (6patients) in onlay group and 2% (1 patient) in sublay group hence concluding that sublay is better than onlay. This study is almost comparable to present study.[12]

Weber et al conducted study on 550 patients and noticed recurrence in 22(12.2%) patients in onlay technique and 53(14.4%) in sublay technique as patients considered in sublay technique (369). So, recurrence rate is more in sublay technique.[13]

Abdollahi et al conducted study on 354 patients and noticed 2(6.1%) recurrence in onlay technique and 2(0.6%) in sublay technique with SSI in 1(3%) patient in onlay technique and 7(2.2%) in sublay technique.[14]

Kharde K et al conducted a prospective study with 50 cases out of which, 25 cases were operated by the onlay mesh method and 25 by retro-rectus mesh placement for midline hernias.[15] The operative time for retrorectus mesh placement was insignificantly higher than that of onlay mesh repair, whereas, complications like superficial SSI were identical in both the study groups, but deep SSI leading to infection of mesh was higher in on-lay mesh repair. The recurrence rate was found to be 4% in on-lay mesh repair and 0% in retrorectus mesh repair.[15] This study almost comparable to present study in view of recurrence.

Failure of incisional hernia repairs are more likely with large, multiple recurrent hernias in elderly patients who suffer postoperative complications. Recurrence can creep under the edges of the mesh if peripheral fixation is not adequate; this is particularly important around the umblicus where an adequate overlap is necessary together with a slit to accommodate the linea alba.

CONCLUSION

In present study sublay technique is found to be more acceptable in view of hospital stay, surgical site infections, and recurrence. As the learning curve for laparoscopic incisional hernia repair is quite long and major obstacle to success is mesh fixation. So, author consider sublay technique is superior to onlay technique for incisional hernia repair.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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