

Approach in an Open Incisional Hernia Mesh Repair - Transverse or Vertical Incision: A Prospective Analysis

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Abstract

Background: Incisional hernia is a common surgical condition with a reported incidence of 2-11% of patients subjected to abdominal operations. **Aim:** This is a prospective study which was under taken to study the differences in the post-operative events of the onlay mesh repair between the transverse and the midline vertical incision approach in our setup. **Methods:** This is a prospective study of 55 cases of incisional hernia that were operated in the department of general surgery, Govt. medical college, Omandurar govt. estate, Chennai, India from Nov 2016 to June 2017. Patient's history, clinical finding, investigations, operative findings, operative procedures and post-operative complications were all recorded in a proforma specially prepared. All patients underwent onlay mesh repair. The approach of the repair was based on the preference of the operating surgeon & the ease to proceed with surgery. Patients were followed up for immediate post-operative complications. The two groups were compared using appropriate statistical tests. **Results:** Most of the patients presented with incisional hernia in the infra-umbilical region. 30 patients were approached with transverse incision & 25 patients with midline vertical incision. Pain score & duration of drainage were significantly higher in the transverse approach group. Postoperative complications were also higher among the transverse group than in the midline vertical incision group, but none of them were statistically

significant. **Conclusion:** The study showed that the post-operative complications were higher in the transverse incision group, but none of them were statistically significant, for onlay mesh repair of incisional hernia.

Keywords: Incisional Hernia; Onlay Mesh Repair; Transverse Incision Approach; Vertical Midline Approach; Post-Operative Complications.

Introduction

Incisional hernia is any abdominal wall defect with or without a bulge in the site of a previous surgical scar, perceptible or palpable, either by clinical examination or imaging [1]. Incisional hernias develop in about 2-11% of all abdominal surgeries.

As it is an iatrogenic problem, with the increasing number of abdominal surgeries, the incisional hernias also increase. It adds to the morbidity of the patient and increases the health care cost. Recurrence is a nightmare for the hernia surgeon.

Aims & Objectives

There are various techniques of repair of incisional hernia available such as simple anatomical suture repair, mesh repair and laparoscopy methods. Anatomical repairs have become obsolete now as incisional hernia is thought to be due to a biological problem of stable scar tissue formation. Sutured repair results in recurrence rates of 2-3 times greater than mesh repair. Hence now mesh repair is superior to anatomical repair [2] & is considered as the standard technique.

In mesh repair for an incisional hernia, the common technique is the onlay mesh repair. There are 2

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approaches for initiating the repair: vertical midline & transverse incisions. Although it is considerate to initiate the repair along the site of the scar, several times it may be difficult to follow this, as the scar site may be fibrosed and this may lead to wound complications, while raising the flaps for an onlay mesh repair. This study is the prospective analysis of the postoperative events of the above 2 approaches for the onlay mesh repair. This study is also to analyse which approach will be better of the two in an onlay mesh repair of an incisional hernia.

Observations were noted regarding duration and ease of operation in both the groups. Other parameters such as duration of drainage, wound complications like seroma formation, wound infection, flap necrosis, recurrence, etc. Early mobilisation was encouraged. After discharge from hospital, the cases were followed up for complications. Observations were tabulated and appropriate statistical tests were used to calculate the level of significance. The above study was conducted after getting clearance from the institution's ethical committee.

Materials & Methods

A prospective study was conducted of all the cases of incisional hernia which were admitted in four units of Government Medical College, Omandurar Government Estate, Chennai between Nov 2016 and June 2017. A total of 55 cases of incisional hernia were operated in the four surgical units in that period. The defects of the incisional hernias, ranged from 2.5cm to 10cm. Giant hernias more than 10cm size and those with loss of domain were excluded from the study. The patients were investigated for fitness for surgery and for the presence of comorbid conditions like COPD, diabetes, anemia, hypoproteinemia and hypertension. If detected, they were treated appropriately before taking up the cases for surgery.

Out of 55 patients, 30 patients underwent open ventral hernia repair by the transverse approach. The other 25 patients underwent open ventral hernia repair by the vertical incision. All the patients received one dose of antibiotic prophylaxis I.V cefotaxime 1 gm at induction and the same antibiotic was continued for 5 days post-operatively. Closed suction drains were removed.

Results

Fifty five patients underwent incisional hernia repair during the period. The youngest was 26 yrs old and the oldest was 68 yrs old. All patients were female [3]. All the hernias were lower midline or pfannenstiell incisions scars which were the result of some obstetric or gynaecological surgeries.

The total time for surgery in transverse approach was 60-100 minutes with a mean of 83 minutes. Vertical incision approach repair took 50 - 90 minutes with a mean of 65 minutes. The postoperative pain was calculated using the visual analog scale (VAS) of 1-10 (Table 1). Postoperative pain was more in the transverse approach than the vertical incision approach.

Postoperatively the drainage lasted for 6-8 days in transverse approach group and 4-6 days in vertical incision approach group. [p value - 0.0029/ statistically significant/ unpaired t test]. The duration of hospital stay was slightly longer in the transverse approach (mean - 11 days) group than the vertical incision approach group (mean - 9 days). [p value - 0.2021/ not statistically significant/ unpaired t test]

Table 1: Post operative pain score

Postoperative Pain (VAS)*	Transverse Approach N=30	Vertical Incision Approach N=25
<5	13	14
>5	17	11

*visual analog score; [p value - less than 0.0001/ statistically significant/ paired t test] Closed suction drains were removed when the drain output was <30ml/24 hrs for 2 successive days.

Table 2: Postoperative complications

Complication	Transverse approach n=30	Vertical incision approach n=25	Comparing by FISHER TEST - p value/ significance
Flap necrosis	2(6.7%)	Nil	0.4949/ not significant
Wound seroma	5(16.7%)	3(12%)	0.7153/ not significant
Wound infection	4(13.3%)	2(8%)	0.6779/ not significant
Post operative ileus	2(6.7%)	-	0.4949/ not significant
DVT	-	-	-
Enterocutaneous fistula	-	-	-
Chronic pain	2(6.7%)	-	0.4949/ not significant
Recurrence	Nil	Nil	-

In the transverse approach group two patients developed flap necrosis and four of them developed superficial wound infection. The necrosed areas were excised and wound was dressed, until wound contracture and closure. None of them required for the mesh to be removed. The infection responded to wound debridement and wound dressings and antibiotics [4,5]. Wound seroma was noticed in five of them which required only opening of one or two skin stitches for drainage.

In the vertical incision group there was no incidence of flap necrosis. Three patients developed wound seroma and two of them developed superficial wound infection which was treated with drainage by opening one or two skin sutured and dressings (Table 2).

Two patients in the transverse approach group developed abdominal distension and ileus in the postoperative period which responded to conservative management of nasogastric suction and I.V fluids. None of the patients from either of the group suffered from recurrence during our follow up.

Discussion

All the patients in this study were females, as it occurs more commonly in them [6] and all the hernias were in the lower abdomen [7]. This may be because of the following reasons:

1. Lower abdominal hydrostatic pressure is higher in the lower abdomen than the intra abdominal pressure in the upper abdomen.
2. Absence of posterior rectus sheath below the

arcuate line.

3. Pregnancy causes over stretching & weakness of the muscles of the lower abdomen.

The mean total time taken for the operation in our study was 83 min for transverse approach group and 65 min for the vertical incision approach group. This is due to more time needed to raise a wider area of the flap in transverse approach group patients.

The postoperative pain was more in patients who underwent repair via the transverse approach compared to vertical incision ($p < 0.0001$ / statistically significant). This can also be explained by the fact that more area of dissection is involved in the transverse approach.

The duration of drain was also longer in the transverse group, which is also because of the wider area of the flap to be raised and subsequent fat-lysis. (p value - 0.0029/ statistically significant).

Wound seroma in the present study was 16.7% in the transverse approach group which is slightly more than that in the vertical incision group (12%). This is because of the need for extensive dissection needed for the creation of the subcutaneous plane.

In the vertical incision approach group, skin necrosis is rare because large skin flaps are not created and careful attention is paid to preserving the perforating blood vessels that supply the remaining skin and subcutaneous tissues.

In our study in the transverse approach group, 2 cases (6.7%) suffered from post-operative flap necrosis and infection because of the wider area of skin flaps that were created for placing the mesh

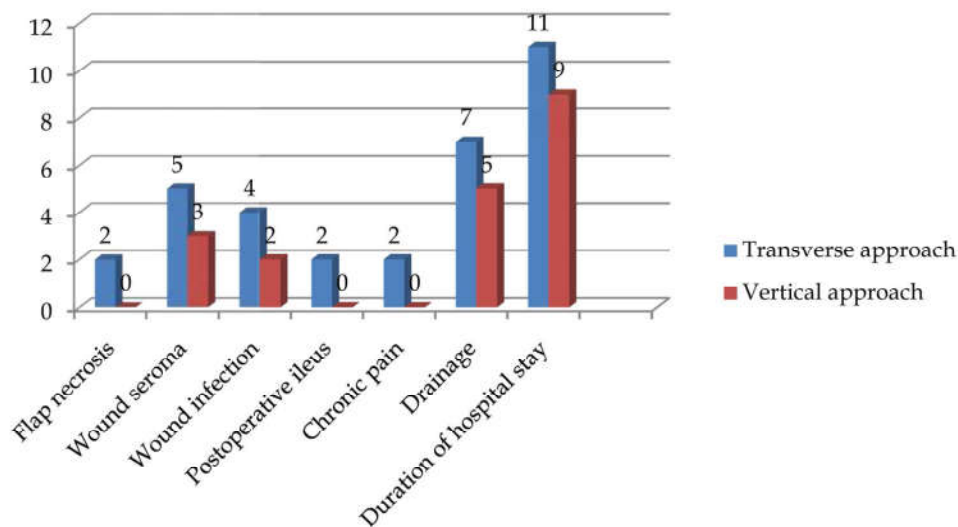


Illustration 1: Comparison of Post-operative Complications

which may have interfered with the perforators of the skin and subcutaneous tissues. There were no recurrences in the present study in both the groups. This is due to the small size of the sample taken.

The complications (illustration 1) & the duration of hospital stay were slightly higher in the transverse approach group [3]. But none of them were statistically significant. The complications were lesser compared to other studies [8].

Conclusion

Although there is no statistically significant difference in the outcome parameters of the two approaches, that is transverse and vertical incision approaches, theoretically the transverse approach is said to be a better procedure. Even though it produces a cosmetically good scar, it takes a longer time and had resulted in the dreaded complication of skin flap necrosis that was not observed with vertical incision approach group. The pain score & the duration of suction drain were also statistically higher among them.

To conclude, vertical incision approach appears to be simpler, easier and less complicative than that of the usual transverse approach.

To show a statistically significant advantage of the vertical incision approach over the transverse approach, we need a randomized control trial with a large sample size and a long follow-up. Until then incision should be driven by surgeon's preference with respect to the patient's disease and anatomy [9,10].

Conflict of Interest

The authors acknowledge that there is no conflict of interest with regards to this article.

References

1. Korenkov M, Paul A, Sauerland S, Neugebauer E, Arndt M, Chevrel JP, et al. Classification and surgical treatment of incisional hernia: Results of an experts' meeting. *Langenbecks Arch Surg* 2001;386:65-73.
2. Deshmukh SN, Varudkar AS, Chopde AV. Clinical study and management of incisional hernias: a prospective monocenter experience. *Int Surg J* 2017;4:1657-61.
3. Olmi S, Magnone S, Erba L, Bertolini A, Croce E. Results of laparoscopic versus open abdominal and incisional hernia repair. *Journal of society of laparoendoscopic surgeons*, 2005;9:189-95.
4. Bhat N, Zaidi S, Riyad M, Bukhari S. Clinical profile and management of incisional hernias. *Internet J Surg*. 2009;26(1):1-9.
5. Kondreddy S, Rigved N. Incisional hernia- a prospective study of 50 cases for 1 year. *Indian J Appl Res*. 2014;4(5):403-7.
6. Sudhir Dnyandeo Bhamre, Nitin Devidas Pingale. A Clinical Study of Incisional Hernia. *MVP J Med Sci* 2016;Volume 3, Issue 1, January-June 2016.
7. Kumar SJG, Manangi M, Kumar UK, Madhu KP, Arun BJ, Nagaraj N. A clinical study of incisional hernia and management. *Int Surg J* 2016;3:1341-4.
8. Hitesh Khandra, Nilesh Patel, Hiren Parmar, Rajan Patel Operative and post-operative variables for incisional hernia repair by open and laparoscopic technique. *IAIM*, 2015;2(1):36-43.
9. Seiler CM¹, Deckert A, Diener MK, Knaebel HP, Weigand MA, Victor N, et al. Midline versus transverse incision in major abdominal surgery: a randomized, double-blind equivalence trial. *Ann Surg*. 2009 Jun;249(6):913-20.
10. Narayanaswamy T, Venugopal K, Nikshita N. "Clinical study and management of incisional hernias: our experience". *J. Evolution Med. Dent. Sci*. 2013 Nov 25;2(47):9112-9118.