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Original Research Article

Study of outcome of a new method of darning for repair of large and recurrent hernias

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ABSTRACT

Background: Incisional hernia is the result of a failure of fascial tissues to heal and close following laparotomy. Laparoscopic Meshplasty is a standard method of repair but not usually done in large incisional and recurrent hernias. Recurrence after repair is common in incisional hernia and poses a significant challenge for the plastic surgeons. We describe here a technique of anatomical repair of the large incisional, and recurrent hernia by darning without using mesh, which is effective in midline, paramedian as well as transverse incisional hernias. Aims and objectives to study the outcome and efficacy of our technique of Darning in cases of large and recurrent incisional hernias without using mesh.

Methods: It is a prospective non randomized study of 5 year duration in which we have studied 20 cases of either large or recurrent incisional hernia admitted in our hospital. We operated these cases by darning of the rectus sheath without tension by mattress suture by prolene no.1.

Results: 20 patients underwent this repair with few minor complications and there was no recurrence for minimum period of follow of 2 years. Approximation of inner margin and separately mattress pattern darning of outer rectus sheath by prolene no.1 strengthens the repair, but do not cause complication associated with meshplasty like infection, adhesion and fistula formation.

Conclusions: Our technique of darning is an extraperitoneal method of hernia repair which do not incorporate mesh and is an effective method of hernioplasty with manageable early postoperative complication. We have not seen any recurrences in follow up period.

Keywords: Darning repair, Incisional hernia, Meshplasty, Recurrent hernia

INTRODUCTION

A postoperative ventral abdominal wall hernia (incisional hernia), is the result of a failure of fascial tissues to heal and close following laparotomy. Incisional hernia is one of the common postoperative complications of abdominal surgeries. Such hernias may increase in size to enormous proportions. Modern rates of incisional hernia range from 2% to 11%.[1-3] In Developing countries where abdominal surgeries are still predominantly performed; by open method this rate is quite higher. Recurrence after repair is common in incisional hernia and poses a significant challenge for the plastic surgeons. Recurrence is seen in up to 44 % of patients.[4]Incisional hernia has been grouped into stages using width and the wound class alone shown in Table 1.[5-7] As the size of the hernia increases chance of recurrence increases, similarly if there is infection following meshplasty, or pressure necrosis at hernia site chances of recurrence increases. Small and medium size incisional hernia can be repaired by laparoscopic method, and well managed in general surgery. Large hernias and recurrent incisional hernias following meshplasty are most frustrating and difficult to treat. These are the cases which are referred to plastic surgery department. Despite good result in terms of safety and minimal recurrence ensured by laparoscopic in

the management of incisional hernia. The use of minimally invasive technique for large incisional wall defect is still controversial, and it is contraindicated in recurrent incisional hernia.

Table 1: Incisional hernia staging system.

Stage	
Stage I **Risk: Low recurrence, low surgical site occurrence**	<10 cm, clean
Stage II **Risk: Moderate recurrence, Moderate surgical site occurrence**	<10 cm, contaminated 10-20 cm clean
Stage III **Risk: High recurrence, high surgical site occurrence**	≥ 10 cm, contaminated any ≥20 cm

There is evidence that, with correct preparation of the patient and with correct anatomical reconstruction, better result can be achieved. Also the use of strictly applied technical skills, in combination of with standardized operative technique may help to eliminate further complication and recurrence. We describe here our technique to repair the large incisional, and recurrent hernia without using mesh, effective in midline as well as incisional hernia at other sites. Our technique is based on anatomical repair with modification by darning the rectus sheath.[8-11] Concept of Anatomical repair for restoration of function anatomy was originally introduced by Abrahamson Known as Shoelace darning technique.[12] A lots of work and modification has been done till then. Our technique has shown very good results, no significant postoperative complications and no recurrence in minimum follow up period of 2 years.

METHODS

It is a prospective non randomized study of 5 year duration from Jan 2014 to Jan 2019 in N. R. S Medical College and hospital Kolkata Plastic and Reconstructive Department. 20 patients were included in this study which has developed large or recurrent incisional hernias following abdominal surgery and given informed written consent for inclusion in this study. These cases were operated in plastic surgery department and were referred to us from general surgery department of our institution, or attended our outdoor patient department and then admitted. The data was entered in Microsoft Excel. The frequencies, proportions were calculated using SPSS software version 17.

Inclusion criteria

Patients suffering from a incisional hernia

- Age group: 20–65 years
- Single abdominal defect larger than 4 cm.

Exclusion criteria

- Obstructed incisional hernia presenting as acute abdomen
- Multiple defects
- Presence of ascites
- Morbid obesity

Method of repair

Incision is given to excise the previous scar. The skin and subcutaneous tissue above the anterior rectus sheath are dissected 5 cm. from the margin of hernia. Now an incision is given on the anterior rectus sheath 2-3 cms from the margin of hernia. The procedure is repeated on the other side. Now the inner margin of the anterior rectus sheath are stitched up with prolene 1-0 suture and hernia contents are reduced without opening the peritoneum as shown in Figure 1.

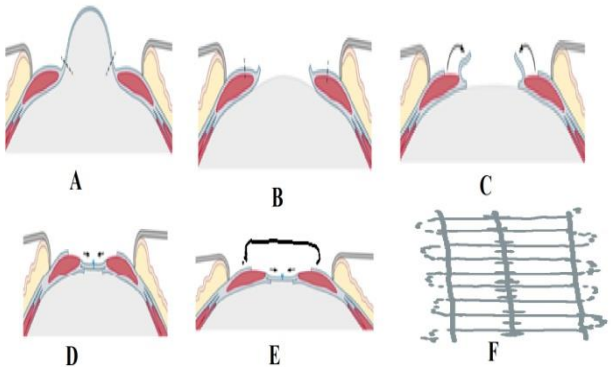

Figure 1: (A) Anatomy of the incisional hernia. Red area is muscle with the fascial layer anteriorly made up of rectus sheath and aponeurosis of external oblique. The hernial sac is seen protruding through the defect in the muscle and fascia. (B), (C), (D) Anterior fascia flapped medially to meet the fascial flap from the other side. No. 1polypropylene closure of fascia, reducing the hernia and giving a tension-free fascial closure of the defect. However, muscle of the anterior abdominal wall (shaded area) is now exposed to superficial structures and is without fascial support. (E), (F) The continuous heavy prolene no 1 suture passing in mattress pattern between the cut edges of the anterior rectus sheaths but it is not passed through the new midline (This is the difference from the original shoelace technique), (F) showing the pattern of darning from the front view.

The remaining margins of the rectus sheath whether vertical or transverse are repaired by prolene no. 1 suture in a mattress fashion. Even when the margins of the sheath cannot be approximated, the prolene layer in the interval between the sheath form strong support to the anterior abdominal wall and holds the repair intact.

Suction drains were used in all cases to drain the collection underneath the skin flaps. The drains are

removed when the drain output is less than 50 ml over 24 hour. It prevent haematoma, seroma formation as well as enhance adherence between the undermined skin flaps and the underlying tissue. All Patients were mobilized in 2-3 postoperative days. Patients are advised to wear a comfortable abdominal support strapping for 4 weeks to prevent seroma formation.

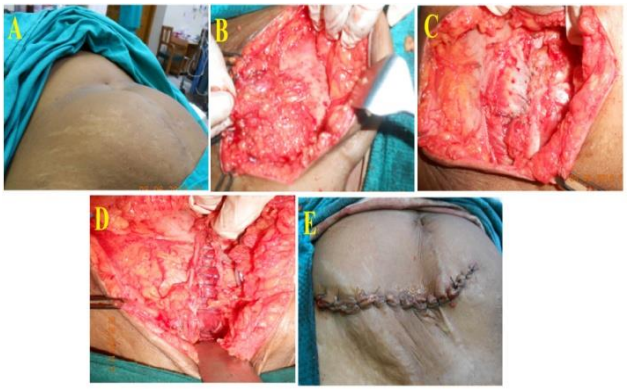

Figure 2: (A) 36 year old lady post LSCS recurrent incisional hernia (B) Dissection if the lateral margin of the rectus sheath (C) Approximation Of Medial Margin Of Anterior Rectus Sheath after reducing hernial content extraperitoneally. (D) Darning of lateral margin of rectus sheath without tension (E) Closure of the the skin and subcutaneous tissue after excision of redundant skin.

RESULTS

A total of 20 patient were treated by this method, among them 13 (65%) were female and 7 (35%) male, details are shown in Table 2.

Table 2: Age and sex distribution of 20 patients.

Age (in years)	Sex		Total (%)
	Male	Female	
20 to 29	1	2	7 (35)
30 to 39	3	6	9 (45)
40 to 49	2	5	3 (15)
50 to 59	1	-	1 (5)
Above 60	-	-	-
Total	7	13	20

9 (45 %) patient presented with recurrence at the age of 30 to 39 years. None of the patient in our study group was above 60 year. Second most common age at presentation was between 40 to 49 years. Size, site, previous surgeries, comorbid factors and wound characteristics are presented in Table 3.

5 cases have primary incisional hernia, while, 15 patients previously unsuccessful treatment of abdominal incisional hernia using either primary repair or placement of synthetic material. Among them 12 patient were operated once for incisional hernia. Most hernia (75%) at the time of presentation was of 10-15 cm in diameter.

Table 3: Characteristics and variables.

Characteristics	No. of patients
Previous repair	
Nil	5
Once	12
Twice	3
Localization	
1) Midline vertical	10
2)Transverse / oblique	10
Above umbilicus	3
Below umbilicus	7
Size (diameter)	
4-10 cms	5
10-15 cms	15
Reducibility	
Reducible	13
Irreducible without obstruction	7
Comorbid factors	
Respiratory disease	1
Diabetes	5
Wound assessment	
Clean	18
Clean and contaminated	2

5 patients had history of diabetes and were on oral hypoglycemic and 1 was affected with chronic obstructive pulmonary diseases when presented to us. Out of the 20 case 2 has skin ulceration at the hernia site while 18 have only gap in the abdominal wall without any skin ulceration. In 15 (75%) case defect was larger than 10 cm diameter. 13 cases of hernia were reducible at the time of presentation out of which 5 were primary incisional hernia, and 8 cases were of recurrent incisional hernia. 7 cases were of irreducible recurrent hernia without obstruction.

Table 4: Details of surgical approach used earlier and surgery in the past and number of patients (N).

Incision	N	Surgical procedure in the past
Lower midline	7	LSCS, Hysterctomy Emergency laparotomy
Pffennenstiel	7	LSCS, ovarian tumor
Upper midline	3	Emergency laparotomy
Upper transverse incision	3	Pancreatic disease

14 among 20 cases have hernia following either LSCS or Gynaecological surgeries contributing 70%.

Average hospital stay following repair 10-12 days. 9 patients had complications in post - operative period, detailed in Figure 3, while 11 patients were quite well

post operatively. We have seen no recurrence in repaired cases in a minimum follow up period of 24 months.

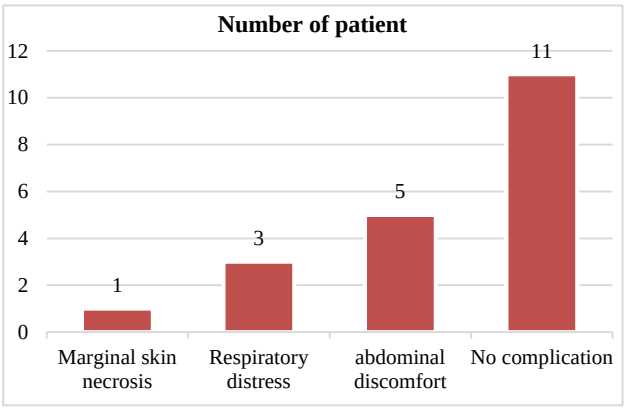

Figure 3: Post operative complications.

DISCUSSION

In our study Total 20 patients were included in which 13 (65%) patients were female and 7 (35%) were male (Table 2). Age ranged between 20 to 59 years, incisional hernias were commonest amongst those who had earlier undergone gynaecological operative procedures through a lower midline incision. Among male the most comman cause was exploratory laparotomy for acute abdomen (Table 4).

The time interval between operation and development of incisional hernia varied between 6 month to 5 years. 15 patients (75%) presented to us who had recurrent hernia following prior unsuccessful incisional hernia surgery, out of which 12 (60%) were operated once and 3 (15%) patient had operated twice for ventral hernia. In 9 patient previous repair had been done using prosthesis mesh, while in 6 patients primary repair were done. On exploration we found mesh contracted and severe stiffness around it.

Mesh contraction, migration, Inappropriate overlapping (less than 5 cm) lead to high recurrence rate in incisional hernia even after using meshplasty.

In our study, we did tension free approximation of the rectus sheath, in cases where complete approximation if the both margin were not possible we darn the margins together without undue tension.[13] Most common complaint in postoperative period was abdominal distress, followed by respiratory distress and marginal skin necrosis, as shown in Figure 3. All patients were managed symptomatically in post-operative period. None of the patient shown complications like seroma, hematoma, perforation peritonitis, obstruction, etc.

Langer and Christiansen, compared their results using primary repair with historical data using a mesh and suggested that the use of mesh gave a better repair with less recurrence.[4]

Loh et al in their literature review suggested that the better results with mesh were simply a manifestation of inadequate length of follow-up, and furthermore, they highlighted a number of complications associated with the use of mesh.[11] Liakakos et al in a non-randomized study comparing the postoperative complication of primary closure versus the use of mesh found out that the recurrence rate was less with mesh at a mean of 7.6 years of follow-up.[14] Wound infection and infection of the mesh can be grave complications often necessitating removal of the mesh. Wound infection in open mesh repairs is thought to approximate 5%.[15]

In our study of Darning for large and recurrent incisional hernias, no recurrence was seen in the 20 cases studied at a minimum follow-up period of 18 months, maximum follow-up being of 3 years. Study done by Johnson D and Harrison DH for large ventral hernia repair without using mesh has shown result supporting our study; they have not seen any complication and recurrence in their research.[16]

CONCLUSION

Darning repair of rectus sheath is an excellent method of repair of large and recurrent incisional hernia. On one hand it significantly reduces chances of postoperative complications like hematoma, seroma and wound infection. On the other hand it reduces the total cost of treatment. It has been found that the recurrence rate following this technique of repair is minimal if done meticulously.

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

REFERENCES

1. Santora TA, Rosalyn JJ. Incisional hernia. Surg Clin North Am. 1993;73:557-70.
2. Mudge M, Hughes LE. Incisional hernia: a 10 year prospective study of incidence and attitudes. Br J Surg. 1985;72:70.
3. Regnard JF, Hay JM, Rea S. Ventral incisional hernias: incidence, date of recurrence, localization, and risk factors. Ital J Surg Sci. 1988;3:259.
4. Langer S, Christiansen J Long-term results after incisional hernia repair. Acta Chir Scand. 1985;151:217-9.
5. Petro CC, O' Rourke CP, Posielski NM. Designing a ventral hernia staging system. Hernia. 2016;20(1):111-7.
6. Kanters AE, Krpata DM, Blatnik JA, Novitsky YM, Rosen MJ Modified hernia grading scale to stratify surgical site occurrence after open ventral hernia repairs. J Am Coll Surg. 2012;215:787-93.
7. Townsend CM. Sabiston Textbook of Surgery, 20 th Edition; Philadelphia; Saunders/Elsevier. 2017;110.

8. Young D, Repair of epigastric incisional hernia. Br J Surg. 1961;48:514-6.
9. Dixon CF, Repair of incisional hernia. Surg Gyneco. Obstet 1929;48:700-1.
10. Hunter RR. Anatomical repair of midline incisional hernia. Br J Surg. 1971;58:888-16.
11. Loh A, Rajkumar JS, South LM Anatomical repair of large incisional hernias. Ann R Coll Surg Engl. 1992;74:100-5.
12. Epigastric AJ. Umbilical and ventral hernia. Maingot's Abdom Surg. 1997;423:430.
13. Fartman EH. Tension free suture of incisional hernia, der chirurg; Zeitschrift fur alle Gebiete der operative Medizen. 1997;68:310-6.
14. Liakakos T, Karanikas I, Panagiotidis H, Denderinos S Use of Marlex mesh in the repair of recurrent incisional hernia. Br J Surg. 1994;81:248-9.
15. David PJ, Brooks DC, Hernias: Maingot's abdominal operations, 11th ed. 1997;133-8.
16. D Johnson, Harrison DH. A technique of repairing massive ventral incision hernias without the use of mesh, Br J Plastic Surg. 1999;52:399-403.

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