

Outcomes of Open Mesh Hernia Repair: Five Year's Experience at Chandka Medical College Hospital Larkana

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ABSTRACT

OBJECTIVE: To document the outcomes of open mesh repair in the management of various hernias.

STUDY DESIGN: A descriptive case-series study.

SAMPLING TECHNIQUE: Non-probability purposive.

PLACE & DURATION OF STUDY: Department of Surgery, Unit-I Chandka Medical College Hospital, Larkana, from July 2003 to June 2008.

PATIENTS & METHODS: Two hundred and eighty patients of hernia operated by sublay mesh repair were analyzed for postoperative outcomes as pain, surgical site infection, haematoma/seroma, sinus formation and recurrence. Data were collected by filling specially designed proforma for each patient. Follow up visits were scheduled at three weeks, six weeks, three months and six months postoperatively.

RESULTS: Polypropylene sublay mesh repair was performed in 280 patients of hernia comprising of 174 males and 106 females with male to female ratio of 1.6:1. Age ranged from 20 to 78 years, mean 51 years. Inguinoscrotal hernia was the commonest type (52.5%), followed by paraumbilical hernia (26.25%) and incisional hernia (13%). Postoperatively 254 (91%) patients had uneventful recovery, 15 (5.3%) had surgical site infection, while 11 (3.9%) patients developed seroma. Neither recurrence nor chronic discharging sinus were noted.

CONCLUSION: Open mesh repair for hernia is a safe and effective technique, associated with low morbidity. Technique has proved to be simple and easy to perform, with minimal post-operative pain and early mobilization.

KEY WORDS: Hernia, Mesh repair, Hernioplasty.

INTRODUCTION

The evolution of hernia repair is well documented in the literature. Initially there was an anatomical period when the architecture of the inguinal region was identified between 1750 and 1865. Later on, there was a surgical period based on concepts of anatomic repair using natural or modified natural materials for reconstruction. Edoardo Bassini in 1883 invented 1st successful inguinal hernia repair¹.

The third period is the modern way of tension free prosthetic mesh repair. Lichtenstein in 1970 introduced the open mesh inguinal hernia repair².

Since then this technique has become the most commonly used (with various modifications) on account of its ease of operation and because it provides a tension-free repair with good long-term results³.

Traditional suture repair of inguinal hernia is rapidly giving way to routine tension-free mesh repair. In many countries, mesh repair is now more common than suture repair⁴.

Devlin and Barwell in UK have demonstrated that an individual with a special interest in inguinal hernia surgery can deliver excellent results within existing surgi-

cal centres^{5,6}. In US, Deysine and co-workers took this process one step further and organized a clinic for abdominal wall hernias staffed by a number of general surgeons with special interest in hernia and delivered improved outcome⁷.

In 1979, first laparoscopic mesh hernia repair was attempted⁸. Mesh technique is the method of choice for the repair of all hernias and is rapidly gaining popularity world-wide. Monofilament polypropylene mesh has greatly simplified the treatment of most difficult hernias.

The methods and results of hernia repair have received increasing attention recently, both in the surgical world and in the lay press⁹. Open mesh hernia repair involves reinforcement of the entire inguinal floor by sheet of prosthesis, which extends well beyond the Hesselbach's triangle in order to provide sufficient mesh/tissue interface¹⁰.

Utilization of the polypropylene mesh in abdominal wall hernia surgery has become increasingly popular. The use of synthetic mesh for achieving a tension free repair has resulted in a significant reduction in postoperative recurrences¹¹. Mesh induces an intense in-

flammatory response and enhances fibroblastic growth and collagen synthesis and forms a firm barrier against herniation¹².

Mesh repair is nevertheless associated with complications such as foreign body reaction, infection, pain, fistula formation, migration, shrinkage, and recurrence¹³.

Some of these problems are seen more usually and become more severe such as chronic pain and discharging sinus/fistula formation, necessitating re-operation^{14, 15}.

The aim of this study was to document the outcome of open mesh repair in the management of various hernias at Department of Surgery Unit-I, Chandka Medical College Hospital, Larkana, from July 2003 to June 2008.

PATIENTS & METHODS

Two-hundred and eight patients presenting with various patterns of hernia at Chandka Medical College Hospital, Larkana - Pakistan from July 2003 to June 2008 were non-probability purposive sampling technique. All patients of age 20-years and above who consented for the study were elected for the study. In females consent for not having inclination towards further pregnancies was also obtained before performing the procedure. Emergency cases, presentation of any infective lesion at or around the site of incision, and immuno-compromised patients were not included in this study.

According to the standardized protocol pre-operative workup was performed in all patients. Antibiotic (1st generation Cephalosporin, 1g) was used intravenously in all patients at the time of induction and continued for 24hrs postoperatively or until removal of drain when used.

Patients were operated under spinal anaesthesia for inguinal hernia, and general anaesthesia for ventral hernia and incisional hernia.

Surgical Technique:

For inguinal hernias, surgery was performed as described by Amid et al¹⁶. A 6x11cm polypropylene mesh (Prolene, Ethicon), trimmed with the medial edges rounded off to fit the inguinal canal anatomy, was implanted as a tension-free sublay patch under the external oblique.

The inferior edge of the mesh was secured to the inguinal ligament with 2/0 prolene, while superior edge was sutured to the internal oblique muscle. A slight bulge in the middle of the mesh indicated adequate laxity and a true tension-free repair¹⁷. No closed suction drain was used.

For ventral hernias we placed mesh in a tension-free fashion beneath the muscle (Retrofascial sublay position), where it is most effective, with sufficient overlap

of at least 5-6 cm in all directions. Closed suction drain was used in these hernias.

Analgesia:

For postoperative analgesia, intramuscular Diclofenac Sodium was used for 24-hours, with the dose of 75-mg intramuscular in 8-hourly interval according to severity, followed by oral Acetaminophen (Paracetamol) 500-mg when required. Pain was assessed by verbal rating scale daily.

Data Collection:

Data were collected according to standardized pre-printed forms. Outcome including uneventful recovery, surgical site infection, pain, haematoma/seroma formation, discharging sinus and recurrence were recorded during six months follow up period.

Data were analyzed on SPSS version 13. Frequencies and percentages were calculated for gender and outcomes.

Follow-up:

Follow-up visits were scheduled for 3 weeks, 6 weeks, 3 months and 6 months postoperatively.

Patients were followed for pain, surgical site infection, persistent discharge, recurrence and any other complications or complaints.

RESULTS

Polypropylene mesh repair was performed in 280 patients comprising of 147 males and 106 females with male to female ratio of 1.6:1. Age ranged from 20-78 years (mean 51 years) (**Table-I**).

Inguinoscrotal hernia was the commonest type in 147 (52.5%) patients, followed by paraumbilical in 73 (26%) patients, and incisional in 42 (15%) patients (Table-I). Among 147 patients of inguinal hernia, 19 were recurrent, and among 42 cases of incisional hernia, 5 were recurrent. In all patients polypropylene mesh was used and 2.0 interrupted prolene stitches applied to hold the mesh. Suction drain was used in ventral hernias. Post-operatively 254 (90.7%) patients had uneventful recovery, 14 (5%) patients had surgical site infection (9 superficial infection and 5 deep infection), while 11 (3.9%) patients developed seroma and 1 (0.4%) patient got his mesh infected, which had to be removed (**Table-II**). Of all the patients, 61 (21.7%) required no analgesics after the first night while remaining took oral analgesia for 1-7 days (mean 4.2 days). Majority of inguinal hernia patients were discharged between 24-48 hours (140/280, 50%) while ventral hernia patients stayed for 3-4 days (114/280, 40.7%). One patient having infected mesh stayed for 11 days (**Table-III**). Mean hospital stay was 3.3 days.

No recurrence has been found, neither sinus or fistula formation. Mortality rate was nil. Postoperative follow up period was up to 6 months.

Among 280 patients, 242 (86.4%) returned for follow up visits scheduled for 3 weeks, 6 weeks, 3 months and 6 months postoperatively.

**TABLE I:
AGE DISTRIBUTION AND TYPE OF HERNIAS
(n=280)**

Age Group	No of Patients	Percentage
20 – 30	30	10.7%
31 – 40	52	18.6%
41 – 50	82	29.3%
51 – 60	73	26.1%
61 – 70	34	12.1%
> 70	9	3.2%
Types of Hernia		
Inguinoscrotal Hernia	147	52.5%
- Indirect	82	
- Direct	65	
Paraumbilical	73	26.1%
Incisional	42	15.0%
Epigastric	16	5.7%
Port site	2	0.7%

**TABLE II:
POST OPERATIVE OUT COME (n=280)**

Events	Patients	Percentage
Uneventful recovery	254	90.7%
Surgical site infection	14	5.0%
- Superficial	9	
- Deep	6	
Seroma	11	3.9%
Mesh infection	1	0.4%

**TABLE III:
POST OPERATIVE HOSPITAL STAY**

Patients	Days
Inguinoscrotal hernia	24 – 48 hrs
Ventral hernias	3 – 4 days
Surgical site infection	5 – 6 days
Infected mesh	11 days

DISCUSSION

In this study, 90.7% of the patients had uneventful recovery while 5% developed surgical site infection, 3.9% seroma, and one (0.4%) patient infected mesh. No recurrence was found.

Anwar M.I et al reported 5% wound infection, 19% tightness under skin and no recurrence¹⁶.

Amid PK reported the risk of seroma can be further reduced by deep placement of the mesh in order to avoid direct contact with the subcutaneous adipose tissue, and by closed system drainage of the surgical field whenever a large sheet of mesh is used¹⁷.

Shulman and Lichtenstein I, reported less than 2% wound infection and no recurrence¹⁸.

Conze J et al reported a recurrence rate of 6.8% in incisional hernia repair¹⁹. In a clinical trial of mesh repair for all hernias, it was seen that the recurrence rate reduced to one-third if mesh was used as compared to conventional suture repair²⁰.

Waqar T et al reported wound infection in 10%, seroma in 5%, prolonged ileus in 5% and recurrence in 2.5%²¹.

Petersen S et al reported nil recurrence rate²². Stumpf M et al reported that attaining good results requires an adequate size of the mesh with sufficient overlap of at least 5-6 cm in all directions²³. We also performed the same.

In our study among 147 of inguinal hernia repair, 3 (2.0%) patients having recurrent hernia developed testicular tenderness and swelling of mild degree which subsided within 10 days, leaving normal testes. Wantz has produced convincing evidence that ischaemic orchitis after primary hernia repair is due to venous damage after extensive dissection of the cord and not to compression at the deep ring²⁴. We had avoided extensive cord dissection and divided large inguinoscrotal sac in the canal, if the distal sac found adherent it was left open in situ. Testicular arterial damage may occur in association with the repair of recurrent hernias, when one or more of the three arterial supplies to the testis may already have been compromised by previous surgery²⁵. No case in this study required orchidectomy.

Most of the patients of inguinal hernia repair returned to routine life after 48 hours and of ventral hernia within one week. Majority (60%) of physical labourers returned to work within 4 weeks. One of the factors contributing to early return to work was probably because all these patients were strongly encouraged to

do so. Majeed and Brown²⁶ showed that return to work heavily influenced by the respective family physicians. Some advocating 6 weeks to 3 months rest before returning to work for heavy manual labourers. Therefore, it is important to motivate patients for early return to work as studies have shown there is no evidence of increase recurrence rate with early return to work^{27, 28}.

CONCLUSION

Open mesh hernia repair is safe and effective technique associated with low morbidity. In our experience, this technique has proved to be very simple and easy to perform with minimal postoperative pain and early mobilization. Therefore, we recommend it for treatment of all primary and recurrent hernias.

REFERENCES

1. Bassini E. Nuova technical per la cura radicale dell'ernia. Atti del Associazione Medica Italiano Congresso 1887;2:179-82.
2. Scott NW, McCormack K. Open mesh versus non-mesh repair of inguinal hernia (Cochrane review). In: the Cochrane Library 2002; Issue 3: Update Software: Oxford.
3. Shulman AG, Amid PK, Lichtenstein IL. A survey of non-expert surgeons using the open tension free mesh repair for primary inguinal hernias. *Int Surg* 1995;80:35-6.
4. Schumpelick V, Klinge U. Prosthetic implants for hernia repair. *Br J Surg* 2003;90:1457-8.
5. Devlin HB, Gullen PHA., Waxman BP. Short stay surgery for inguinal hernia: experience of the shouldice, 1970-1982. *Br J Surg* 1986;73:123-4.
6. Barwell NJ. Results of convectional inguinal hernia surgery in England. In: Bucwer MW, Parthmann EH, editors. *Progress in surgery*. Basel: Karger; 1995. Pp.100-4.
7. Deysine M, Grimson R, Soroff HS. Herniorrhaphy in the elderly: benefits of a clinic for the treatment of external abdominal wall hernias. *Am J Surg* 1987;153:387-91.
8. Ger R, Monroe K, Duviver R, Mishrick A. Management of indirect hernias by laparoscopic closure of neck of the sac. *Am J Surg* 1990;159:371-3.
9. Kark AE, Kurzer M, Waters KJ. Tension-free mesh hernia repair: review of 1098 cases using local anaesthesia in a day unit. *Ann R Coll Surg Engl* 1995;77:299-304.
10. Amid PK, Shulman AG, Lichtenstein IL. The Lichtenstein open tension free mesh repair for primary Inguinal hernias. *Surg Today* 1995;25:619-25.
11. Amid PK, Shulman AG, Lichtenstein IL, Hakakha M. Biomaterial & tension free abdominal wall hernioplasty. *Croatian Med J* 1994;28:373-5.
12. Lafferty PM, Malinowska A, Pelta D. Lichtenstein inguinal hernia repair in a primary health care setting. *Br J Surg* 1998;85:793-6.
13. Schurmpelick V, Klinge U. The properties and clinical effects of various types of mesh used in hernia repair. *Asso Great Brit Irel (Year book)* 2001.
14. Kingsnorth AN, Hyland ME. Prospective double blind randomized study comparing Perfix R plug-and-patch with Lichtenstein patch in inguinal hernia repair: One year quality of life results. *Hernia* 2000;4:255-8.
15. Le Blanc KA. Complications associated with plug, and method of inguinal herniorrhaphy. *Hernia* 2001;5:135-8.
16. Anwar MI. Mesh repair for incisional hernia. *J Surg Pak* 2000;19(20):30-2.
17. Amid PK, Shulman AG, Liechtenstein IL, Sostrin S, Young J, Hakakha M. An experimental evaluation of a new composite mesh with the selective property of incorporation to the abdominal wall without adhering to the intestines. *J Biomed Mater Res* 1994;28:373-5.
18. Amid PK, Shulman AG, Lichtenstein IL. Open "tension-free" repair of inguinal hernias: the Lichtenstein technique. *Eur J Surg* 1996;162:447-3.
19. Conze J. Preperitoneal mesh-plasty in incisional hernia repair. *Chirurg*. 1996;67(10):1028-35
20. Friis E, Lindahl F. The tension-free hernioplasty- a randomized trial. *Am J Surg* 1996;172:315-9.
21. Waqar T. Complications of repair of incisional hernia using polypropylene mesh. *Ann King Edward Med Coll* 2005;11(3):319-22.
22. Petersen S. Ventral rectus fascia closure on top of mesh hernia repair in the sublay technique. *Plastic Recons Surg* 2004;114(7):1754-60.
23. Stumpf M. Open mesh repair, Dept: of Surg: University Hospital, RWTH Aachen, Germany.
24. Wantz GE. Testicular atrophy as a sequelae of inguinal hernioplasty. *Int Surg* 1986;71:159-63.
25. Reid I, Devlin HB. Testicular atrophy as a consequence of inguinal hernia repair. *Br J Surg* 1994;81:91-3.
26. Majeed AW, Brown S, Williams N, Hannay DR. Variations in medical attitudes to postoperative recovery period. *Br Med J* 1995;3(11):296.

27. Schulman AG, Amid PK, Lichtenstein IL. Returning to work after herniorrhaphy. 'Take it easy is the wrong advise'. BMJ 1994;309:216-7.

28. Bourke JB, Lear PA, Taylor M. Effect of early return to work after elective repair of inguinal hernia. Lancet 1981;11:623-5.



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