ORIGINAL RESEARCH PAPER
Volume - 9 | Issue - 9 | September - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A COMPARISON BETWEEN SELF-GRIPPING PROGRIP MESH AND PROLENE MESH IN OPEN INGUINAL HERNIA SURGERY : A SINGLE CENTRE STUDY

Surgery

Dr. Paras Kumar MS (General Surgery), Senior Resident, Department Of Surgery, Government Medical College Jammu.

Dr. Priyanka Parihar MBBS, Post Graduate In Department Of Obstetrics And Gynecology, Government Medical College Jammu.

Dr Sanjeev Singh* MBBS, Post Graduate In Department Of Surgery, Government Medical College Jammu. *Corresponding Author

ABSTRACT

Background and objectives: The concept of sutureless mesh came into light in view of post operative inguinodynia after standard prolene mesh inguinal hernia repair. This study was chosen to compare the post operative persisting chronic pain and operative time using both ProGrip mesh and prolene mesh (Modified Lichtenstein repair).

Methods: Analysis was done on 80 patients who underwent open inguinal hernia repair during last one year at Government medical college Jammu. 40 patients were kept in each group. Group A included patients with ProGrip mesh and Group B with prolene mesh. Intra operative time and post operative complications were compared between the two groups.

Results: All patients were males. Mean operative time in Group A was 35.20 minutes and group B was 64.70 minutes. The difference was significant with p value of 0.000. Patients in group A were had a lesser pain as compared to Group B at 3 days, 3 weeks and 3 months. The difference was significant with p value of 0.000 for each. None of the groups had any recurrence or any other complication.

Interpretations and Conclusions: Usage of Progrip mesh is safe and results in lesser post operative chronic pain as well as shorter operative time as compared to prolene mesh.

KEYWORDS

Inguinal hernia, Inguinodynia, Progrip mesh, Prolene mesh.

INTRODUCTION:

Inguinal hernia repair surgery is one of the commonest procedures performed. Moreover, with time the anatomy of inguinal canal became more clear and surgical techniques became better. Introduction of tension free repair was a breakthrough in the field of hernia. This procedure was named as "hernioplasty". Mesh repair is more preferred than suture repair techniques. Lichtenstein's tension free mesh hernioplasty was introduced in 1986, since then this technique became the most commonly used technique for hernia repair and is now considered as the gold standard for open inguinal hernia repairs.[1,2]

The use of polypropylene mesh in hernia repair surgery became very popular, as compared to previously used nylon (Polyamide), which used to degenerate over time. Polypropylene mesh has mild reactivity, good tensile strength, low infection susceptibility but has a propensity to cause adhesion of muscles if placed intra peritonealy.[3]

Lichtenstein hernia repair led to decrease in the recurrence rates to less than 2%. But the post operative chronic pain due to fixation techniques was a considerable problem, which led to various modifications such as absorbable sutures, glue and self fixating meshes.[4]

Inguinodynia has replaced recurrence as primary complication after open inguinal hernia repair.[5] Inguinodynia is a very common and distressing complication following hernioplasty. The frequency of chronic pain was found to be as high as 54%.[6] About 25% patients had restriction in daily activities[7]**.** Pain occurs as a result of foreign body response as well as because of method of fixation of mesh. Foreign body response causes axonal oedema, loss of myelinated axons, peri and endoneuronal oedema leading to pain.[8]

A new self – gripping mesh (ProGrip™; Covidien) has been developed which uses sutureless technique. It is a polyester mesh, which uses sutureless technique and with its unique balance of properties, provides fast and true tissue in-growth with reduced foreign material reactions. It allows surgeons to secure the mesh in less time and provide patient better comfort post surgery.[9] The macroporous polyester mesh has resorbable Polylactic acid (PLA) micro-grips on one side of mesh, which secure quickly without sutures, tacks, fibrin glue or any other form of fixation.[10]

This topic has been taken into consideration in view of high incidence of inguinodynia. The concept of sutureless mesh as well as light weight mesh came into play because of it. This study was chosen most importantly to determine whether the post operative persisting inguinodynia reduces after use of sutureless mesh or not.

MATERIALS AND METHODS:

The study was conducted prospectively on 80 patients over a period of one year. 40 patients were placed in each group. ProGrip group was named group A and Prolene group as Group B. In group A ProGrip mesh of 14 X 9 cm was used.

Inclusion Criteria:

All cases > 18 years with unilateral or bilateral inguinal hernia.

Exclusion Criteria :

1.Obstructed & strangulated inguinal hernias
2.Infected site cases.
3.Age <18 years

Data was collected from patients admitted in the department of surgery for inguinal hernia surgery. The patients were evaluated and followed up according to protocol which include history, clinical examination, routine investigations were done in all cases. Written informed consent was taken. These patients were observed for complications and other parameters as per study protocol.

These patients were followed up at 3 days, 3 weeks and 3 months in surgery OPD after discharge for any recurrence or development of complications including inguinodynia on VAS scale.

Technique Of Progrip Mesh Fixation :-

The mesh should be presented, slit upward, flap open, coloured yarn marker towards the pubis, pin side facing the deep muscular plane. The slit is fitted along the cord. Flap is folded back onto the mesh. Gripping is reversible to allow slit closure to be adjusted several times. The large curve of the mesh is spread out so that it perfectly fits the inguinal ligament. Then the mesh is completely spread, centring by positioning the cord in the central orifice to cover the weak areas. External oblique aponeurosis and cutaneous incision are sutured later.

Mechanical characteristics and gripping strength evaluation of ProGrip mesh:

Mechanical Characteristics

Surface density (g/m^2)	Before PLA resorption	82
	After PLA resorption	41

Thickness (mm)	0.5
Porosity (%)	91

Gripping strength evaluation

Gripping strength (N)	
New self-gripping mesh	21.4 ± 5.7
Standard textile	5.2 ± 0.9

RESULTS:

All the patients operated were males. In group A 30% of patients had direct hernia and 70% indirect whereas 25% patients in group B had direct hernia and 75% indirect. In group A 25% patients had left sided hernia and 75% had right sided. Whereas, group B had 22.5% patients with left sided hernia and group B had 77.5% patients with right sided hernia. Mean age of patients in group A was 58.15±13.316 and group B was 45.65±15.173. Mean operative time in group A came out to be 35.20±2.594 as compared to 64.70±5.384 in the other group. The difference was significant with a p value of 0.000.

Table I: Post Operative Pain Score (VAS)

	Group	Mean	Standard Deviation	p value
3 Days	A	2.25	1.032	0.000
	B	3.65	0.770	
3 Weeks	A	0.35	0.770	0.000
	B	2.05	1.061	
3 Months	A	0.10	0.441	0.000
	B	1.10	1.008	

There was no wound infection, seroma formation, mesh rejection, wound dehiscence, retention of urine or testicular atrophy in any of the patients.

DISCUSSION:

The ideal outcome in inguinal hernia surgery is aimed at providing pain and recurrence free repair while minimising the morbidity and associated complications that the patient may experience and Lichtenstein tension free mesh repair has become the gold standard for open inguinal hernia repair in the last two decades.[11]

But this ProGrip mesh is a revolutionary mesh as it does not use any suture material for fixation, thereby avoiding the risk of nerve entrapment as well as preserving the anatomical structures present nearby.[12] These resorbable PLA mico-grips of ProGrip mesh are blunt to prevent damage to the surrounding tissues.[13]

Some authors claim that there is no evidence that the prosthetic mesh may be the source of postoperative complaints whereas other authors suggest that pain might be caused by the implanted mesh material itself as well as the fixing material.[14] These fixing materials can either be sutures, staples or tackers, all of which may have their own undesired effects or high costs.[15]

The operative time is significantly shorter using ProGrip mesh similar to studies done by Zhang et al and Fang et al.[16,17] ProGrip group had lesser post operative pain as compared to Prolene group which is comparable to study by Sahoo et al.[18] and there was no recurrence seen in any of the groups which is again comparable to study by Fan et al.[19]

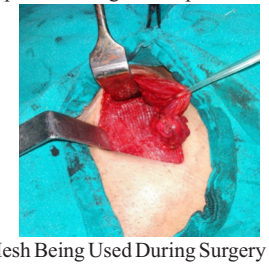

Fig I : Progrip Mesh Being Used During Surgery

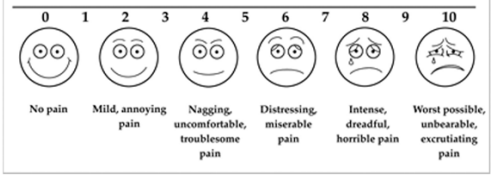

Fig II: Visual Analog Scale (VAS) Used For Inguinodynia Follow Up.

CONCLUSION:

The study concluded that the use of ProGrip mesh in open inguinal hernia repair is a simple, safe, rapid and effective option and is associated with low post-operative pain. Although the time for follow-up of patients to look for recurrence was less as the study duration was only of one year, it is advised to continue the study forwards to look for better recurrence follow-up.

Conflict Of Intertest: None

Source Of Funding: None

REFERENCES:

1. Lichtenstein IL, Shulman AG, Amid PK, Montllor MM. The tension-free hernioplasty. *Am J Surg*. 1989;157:188.
2. Amid PK, Shulman AG, Lichtenstein IL. Critical scrutiny of the open "tension-free" hernioplasty. *Am J Surg*. 1993;165(3):369-71.
3. Voyles CR, Richardson JD, Bland KI, Tobin GR, Flint LM, Polk HC Jr. Emergency abdominal wall reconstruction with polypropylene mesh: short-term benefits versus long-term complications. *Ann Surg.* 1981;194(2):219-23.
4. Campanelli G, Pascual MH, Hoeferlin A, Rosenberg J, Champault G, Kingsnorth A, et al. Randomized, controlled, blind trial of Tissel/Tissucol for mesh fixation in patients undergoing Lichtenstein technique for primary inguinal hernia repair: results of the TIMELI trial. *Ann Surg*. 2012;255(4):650-7.
5. Lau H, Fange, Yuen Wk, Patil NG. Risk factors for inguinal hernia in adult males, a case control study. *Surgery* 2003 141; 262-6.
6. Poobalan AS, Bruce J, Cairns W, Smith S, King PM, et al. *The clinical journal of pain* 2003; 19:48-54.
7. Aasvang E, Kehlet H. Chronic postoperative pain: the case of inguinal Herniorraphy. *Br J Anaesth* 2005; 95:69-76.
8. Felix EL, Michas CA, McKnight RL. Laparoscopic herniorrhaphy. Transabdominal preperitoneal floor repair. *Surg Endosc* 1994; 8:100-3.
9. Kapischke M, Schulze H, Caliebe A. Self-fixating mesh for the Lichtenstein procedure--a prestudy. *Langenbecks Arch Surg.* 2010;395(4):317-22.
10. Chastan P. Tension free open inguinal hernia repair using an innovative self gripping semi-resorbable mesh. Journal of Minimal Access Surgery 2006;2(3):139-43.
11. Kingsnorth A, LeBlanc K. Hernias: inguinal and incisional. *Lancet.* 2003;362(9395):1561-71.
12. Yilmaz A, Yener O, Kaynak B, Yiğitbaşi R, Demir M, Burcu B. Self-gripping Covidien™ ProGrip™ mesh versus polypropylene mesh in open inguinal hernia repair: multicenter short term results. *Prague Med Rep*. 2013;114(4):231-8.
13. Kolbe T, Hollinsky C, Walter I, Joachim A, Rulicke T. Influence of a new self-gripping hernia mesh on male fertility in a rat model. *Surg Endosc.* 2010;24:455-61.
14. Köninger J, Redecke J, Butters M. Chronic pain after hernia repair: a randomized trial comparing Shouldice, Lichtenstein and TAPP. Langenbecks Arch Surg 2004;389:361–5.
15. Nikkolo C, Lepner U, Murruste M, Vaasna T, Seepter H, Tikk T. Randomised clinical trial comparing lightweight mesh with heavyweight mesh for inguinal hernioplasty. Hernia 2010;14:253–8.
16. Fang Z, Zhou J, Ren F, Liu D. Self-gripping mesh versus sutured mesh in open inguinal hernia repair: system review and meta-analysis. The American Journal of Surgery. 2014 May 31;207(5):773-81.
17. Smeds S, Nienhuijs S, Kullman E, Sanders DL, Lehnert T, Ziprin P, et al. Identification and management of the ilio-inguinal and ilio-hypogastric nerves in the open inguinal hernia repair: benefits of self-gripping mesh. *Hernia.* 2016;20(1):33-41.
18. Sahoo R, Samal D, Abdullah MO. An institutional comparative study of self-gripping progrip mesh with prolene mesh in repair of inguinal hernia: a single center study. *Int Surg J.* 2018;5:456-9.
19. Kingsnorth A, Gingell-Littlejohn M, Nienhuijs S, Schüle S, Appel P, Ziprin P et al. Randomized controlled multicenter international clinical trial of self-gripping Parietex™ ProGrip™ polyester mesh versus lightweight polypropylene mesh in open inguinal hernia repair: interim results at 3 months. *Hernia.* 2012;16(3):287-94.