ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 03 | March - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EVALUATION OF SELF GRIPPING (PROGRIP™) MESH FOR OPEN INGUINAL HERNIOPLASTY : A SINGLE CENTRE PROSPECTIVE STUDY

General Surgery

Dr. Rakesh Sharma Professor in Department of General Surgery, Government Medical College, Amritsar

Dr. Ashok Singh Associate Professor in Department of General Surgery, Government Medical College, Amritsar

Dr. Samarth Mittal* MBBS, Post Graduate in Department of General Surgery, Government Medical College, Amritsar *Corresponding Author

ABSTRACT

Background: inguinal hernia is the most common type of hernia and is one of the most common general surgical operations accounting for 10 to 15% of all surgical procedures worldwide. The only management of inguinal hernia is surgery and poses therapeutic challenges to general surgeons practicing in resource-limited countries. **Aims and objectives:** The aim of our study is to evaluate the outcome of Lichtenstein repair using a self fixating progrip mesh in regards to operative time , post-operative pain(Inguinodynia), duration of hospital stay and post-operative complications. **Methods:** 40 patients of inguinal hernia were operated using self fixating mesh at Government Medical College Amritsar and evaluated during last one year. **Results:** All patients were males. The mean operating time was 42.3 minutes. Only mild post-operative pain (VAS<3)was present in majority of cases at end of 1st , 4th and 12th week. Maximum duration of hospital stay was 2 days. One case of seroma(2.5%) and one case pus discharge(2.5%) from wound site was seen. **Conclusion:** Use of self fixating mesh is quick , safe, cost effective may be a viable option for patients who require hernia repair but are not good candidates for laparoscopic hernioplasty. Sutureless technique seems to reduce the duration of surgery, risk of nerve entrapment and infection.

KEYWORDS

Inguinal Hernia, Progrip Mesh, Hernioplasty, Inguinodynia, nerve entrapment

INTRODUCTION

Inguinal hernia is a bulging of the contents of the abdomen through a weak area in the lower abdominal wall. There are several classifications for groin hernias but the most commonly used is based on the anatomy of the hernia. Within this simple classification, there are three groups of hernias in the groin. A medial or direct hernia is one that protrudes medially to the epigastric artery and above the inguinal ligament. A lateral or indirect hernia protrudes laterally to the epigastric artery, above the inguinal ligament. A femoral hernia protrudes just below the inguinal ligament medial to the femoral vein.

Inguinal hernias comprise 97% of all groin hernia repairs and 3% femoral hernias. Approximately 27% of males and 3% of females have inquinal hernias in their life times representing the most common hernia in males and females[1]. Approximately 75% of all hernias occur in the groin; two thirds of these hernias are indirect and one third direct[2] . Indirect inguinal hernias are the most common hernias in both men and women; with a right-sided predominance. Incisional and ventral hernias account for 10% of all hernias[3] .Inguinal hernia repair is one of the most common operations performed by general surgeons.

The primary choice of repair in unilateral primary groin hernias is the Lichenstein technique[4]. Lichtenstein described his repair technique as "tension-free", wherein a piece of polypropylene mesh is used to strengthen the fascia transversalis. The recurrence rates of hernia are also less than 2% with this procedure It has been useful in reducing the morbidity risk and can also be used in patients who are otherwise unsuited for the laparoscopic procedure. While both techniques have their advantages and disadvantages, open inguinal hernioplasty is the more traditional approach and has been used for many years.

In spite of the low rate of morbidity and long term prognosis, chronic inguinal pain is reported in a high number of cases[5]. It ranges between 12% and 53% [6-14]. Though chronic post operative pain is seen as a primary outcome of the surgery, yet it affects the social and personal life of the patients in 6% of the patients[6,8,13,15]. Chronic inguinal pain is the major factor that negatively impacts the quality of life and satisfaction of patients in the postoperative period[16].

Post introduction of tension-free techniques, nerve entrapment in suture, foreign body reaction, fibrosis of scar tissue, and inflammation of the periosteum of the pubic tubercle taken into the first stitch[17], mesh fixation with sutures to avoid dislocation has been considered as a cause of chronic pain and discomfort.

However, It is unwise to ignore the impact of Lichtenstein's repair. Since its advent, various modifications have been introduced and has been revolutionary in nature. the modifications began with introduction of non absorbable sutures, absorbable sutures, use of glues and has today come to self fixating systems.

In this study, a tension free sutureless technique is performed by using a self-fixating mesh which was launched by Covidien as ProGripTM in 2008.the polyester mesh is microporous and contains resorbable poly lactic acid(PLA) micro-grips on one side which helps to quickly secure the mesh without the need for sutures, fibrin, glue, tacks or any other form of fixation. It also gives the surgeon the ability to accurately position and secure the mesh in a short span of time thereby reducing the overall surgery time.

Another important characteristic of the mesh is the spacing between individual fibers, or pore size. Larger pore sizes (macroporous) allow for infiltration of macrophages, blood vessels, fibroblasts, and collagen, the components required to combat infection and improve tissue integration[18]. As the mesh is a foreign body, over time the mesh fibers are encapsulated by fibrosis and granulomas.

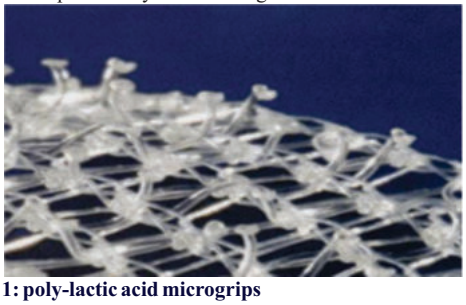

Figure 1: poly-lactic acid microgrips
Sources: www.googleimages.com/progripmesh

MATERIALS AND METHODS

It is a single centre prospective study of forty patients diagnosed with inguinal hernia undergoing hernia repair with a self-gripping ProGrip mesh in the Department of Surgery, Guru Nanak Dev Hospital attached to Government Medical college Amritsar during April 2021 to June 2022 will be included in the study.

The study was conducted after approval from Institutional Ethics Committee, Government Medical College, Amritsar and written informed consent from patient was obtained.

Inclusion Criteria :
All cases of direct or indirect inguinal hernia or both .

Exclusion Criteria:

1. History of recurrent inguinal hernia
2. Pediatric cases

Data was collected from patients admitted in the department of surgery for inguinal hernioplasty. The patients were evaluated and followed up according to standard protocol which include history, clinical examination and routine investigations. Written informed consent was taken. The patients were observed for complications and other parameters as per study protocol. These patients were followed up at 1 week, 4 weeks and 3 months in surgery OPD after discharge to assess any post operative complication.

Technique Of Progrip Mesh Placement: The mesh should be presented, slit upward, flap open, coloured yarn marker towards the pubis, pin side facing the deep muscular plane. Mesh is presented and self - gripping flap is closed around the cord. It is then lowered along the length of the cord and its medial-inferior gripping surface is applied on the pubic tubercle extending 1 cm beyond the tubercle. A single absorbable suture is placed at the public tubercle to aid in positioning the mesh. Mesh is then placed under the aponeurosis of external oblique muscle, the non gripping aspect of mesh is pressed down for final placement. Anchoring the mesh to the underlying tissues with micro-grips is immediate and does not require any additional fixation. The aponeurosis of external oblique muscle is closed using absorbable suture and the cord is left below it. Cutaneous incision is closed.

RESULTS

All the patients included in the study were Males . Direct inguinal hernia was present in 20% of cases and indirect hernia was present in 70% cases while 5% of the cases had both hernias. Mean age of patients was 53.45 years .The mean operative time was 42.30 minutes with standard deviation of 5.01 minutes.

Table – 1 Operative Time

Operative time (Minutes)	Frequency	Percentage(%)
30-35 minutes	3	7.50%
35-40 minutes	15	37.50%
40-45 minutes	11	27.50%
45-50 minutes	10	25.0%
50-55 minutes	1	2.50%
Mean±S.D.	42.30±5.01	

During the immediate postoperative period 70% of the patients had mild pain(VAS - 0-3) and 30% patients had moderate pain(VAS- 4-6). After first day, 85% patients had mild pain and only 15% patients had moderate pain. After end of 1st post-operative week, none of the patients had VAS>3. At the 6th month follow up visit only 10% patients had pain which was mild (VAS- 0-3)in nature. None of the patients had severe (VAS- 7-10) inguinal pain during the entire course of the treatment.

Table – 2 Frequency of patients with post operative pain

VAS score(1-10)	Post op day 1	Post op week 1	Post op week 4	Post op week 12
Mild (1-3)	34	12	9	6
Moderate (4-6)	6	-	-	-

None of the cases had symptoms like tingling, pins and needles sensation, burning pain or muscle weakness which indicates that no incidence of neuropathic pain or nerve entrapment was seen. The patients in our study required only minimal use of oral analgesia and none of the patients required iv analgesia for pain relief after the immediate post-operative period. Majority of the patients were totally pain free after the first post-operative month All the cases were discharged within 2 days of surgery.

Table – 3 Duration Of Hospital Stay

Duration of Hospital Stay	Percentage(%)
1 day	17.50
2 days	82.50
Total	100.00
Mean±S.D.	1.88±0.34

One case each of seroma(2.5%) and pus discharge(2.5%) was present.

Table – 4 Post operative infection

Postoperative Infection	Percentage (%)
Minimal	5.00
Nil	95.00
Total	100.00

There was no incidence of recurrence, mesh rejection, wound dehiscence, retention of urine or testicular swelling in any of the patients.

DISCUSSION

Inguinal hernia repair is still one of the most common elective surgery practiced worldwide by general surgeons. Although it is seen in 75% of all hernias and 3.6% of the whole society, the best repair method is not yet certain. Hernia repair is meant to be simple and easy to apply. In the early period, patient comfort, a minimum loss of workforce, length of stay in hospital and return to work, cost effectiveness and minimizing the recurrences are expected. A better understanding of the physiology and anatomy of the inguinal canal along with the etiopathogenesis has led to constant improvement in the surgical techniques and subsequent improvement in the outcome of the disease. The Lichtenstein method has been the gold standard in the management of inguinal hernias for more than 30 years [19-23].

The results of present study showed the role of self-adhesive mesh in reducing immediate and short term post-operative pain. The patients operated with self-gripping mesh had better VAS score in the early post-operative period, a short operative time and required minimal pain medication.

Reducing complications not only improves patient outcomes, but it also reduces the cost of treatment. Use of self-gripping mesh may result in a shorter hospital stay, reduced postoperative pain, and faster recovery, which may reduce the overall cost of care. Studies have shown that the use of self-gripping mesh may result in lower overall healthcare costs due to the reduced hospital stay and lower incidence of complications.

A study by Abboud W et al in 2018 reported similar results in terms of post operative pain and other complications[24].Gopal K et al in 2020 found similar results in terms of operative time and post operative pain[25]. Del Papa M et al in 2019 also obtained similar results. Rausa E et al in 2019 reported similar outcomes between self gripping mesh and glue fixation in open inguinal hernioplasty[26].

A prospective study was conducted by Techapongsatorn S et al in 2022 comparing open and laparoscopic hernioplasty using suture ,tack ,glue and self gripping mesh and found out that open hernioplasty with self gripping mesh was most cost effective with similar outcomes[27]. Shah MY et al in 2022 reported similar results[28].

CONCLUSION

In conclusion, the use of self-gripping mesh in open inguinal hernioplasty is a promising option that can potentially reduce post-operative pain, operative time, surgical site infections, and overall healthcare costs. Suture-less technique reduces the duration of surgery, risk of nerve entrapment and infection. With its ease of placement and potentially lower costs, self-gripping mesh may be a viable option for patients who require hernia repair but are not good candidates for laparoscopic hernioplasty. While additional research is needed to further evaluate recurrences, it is a promising development in the field of hernia repair surgery.

Conflict Of Intertest: None

Source Of Funding: None

REFERENCES:

[1] Jenkins JT, O'Dwyer PJ. Inguinal hernias. BMJ. 2008 Feb 2;336(7638):269-72. doi: 10.1136/bmj.39450.428275.AD. PMID 18244999; PMCID: PMC2223000
[2] Katz DA Evaluation and management of inguinal and umbilical hernias. Pediatr Ann. 2001;30(12):729-35.
[3] Matthews RD, Neumayer L Inguinal hernia in the 21st century: an evidence-based review. Curr Probl Surg. 2008;45(4):261-312
[4] 1. Lichtenstein IL, Shulman AG, Amid PK, Montllor MM (1989) The tension-free hernioplasty. Am J Surg 157
[5] 188-193. 2. Amid PK, Lichtenstein IL (1998) Long-term results and current status of the Lichtenstein open tension-free hernioplasty. Hernia 2(2): 89-94.
[6] Bay-Nielsen M, Kehlet H, Strand L, Malmstrom J, Andersen FH, Wara P, et al. (2001) Quality assessment of 26,304 herniorrhaphies in Denmark: a prospective nationwide study. Lancet 358(9288): 1124- 1128.
[7] Erhan Y, Erhan E, Aydede H, Mercan M, Tok D (2008) Chronic pain after Lichtestein and preperitoneal (posterior) hernia repair. Can J Surg 51(5): 383-387.
[8] Franneby U, Sandblom G, Nordin P, Nyern O, Gunnarson U (2006) Risk factors for long-term pain after hernia surgery. Ann Surg 244(2): 212-219.
[9] Hetzer FH, Hotz T, Steinke W, Schlumpf R, Decurtinis M, et al. (1999) Gold standard for inguinal hernia repair: Shouldice or Lichtenstein? Hernia 3(3): 117-120.

[10] Kumar S, Wilson RG, Nixon SJ, Macintyre IM (2002) Chronic pain after laparoscopic and open mesh repair of groin hernia. Br J Surg 89(11): 1476-1479.
[11] Paajanen H (2002) Do absorbable mesh sutures cause less chronic pain than nonabsorbable sutures after Lichtenstein inguinal herniorraphy? Hernia 6(1): 26-28.
[12] Perkins FM, Kehlet H (2000) Chronic pain as an outcome of surgery. A review of predictive factors. Anesthesiology 93(4): 1123-1133.
[13] Poobalan AS, Bruce J, King PM, Chambers WA, Krukowski ZH, et al. (2001) Chronic pain and quality of life following open inguinal hernia repair. Br J Surg 88(8): 1122-1126.
[14] Poobalan AS, Bruce J, Smith WC, King PM, Krukowski ZH, et al. (2003) A review of chronic pain after inguinal herniorraphy. Clin J Pain 19(1): 48-54
[15] Kehlet H (2008) Chronic pain after groin hernia repair. Br J Surg 95(2): 135-136 .
[16] Kehlet H.: Chronic pain after groin hernia repair. Br J Surg, 2008; 95: 135–136.
[17] Helbling C, Schlumpf R. Sutureless Lichtenstein: first results of a prospective randomised clinical trial. Hernia 2003;7(2):80-84.
[18] Brown CN, Finch JG. Which mesh for hernia repair? Ann R Coll Surg Engl. 2010; 92(4):272-8.
[19] Amid P.K.: Lichtenstein tension-free hernioplasty: Its inception, evolution, and principles. Hernia, 2004; 8: 1–7.
[20] Kehlet H., Bay-Nielsen M.: Nationwide quality improvement of groin her-nia repair from the Danish Hernia Database of 87,840 patients from 1998 to 2005. Hernia, 2008; 12: 1–7.
[21] Kingsnorth A., LeBlanc K.: Hernias: inguinal and incisional. Lancet, 2003; 362: 1561–1571.
[22] Zamkowski M.T.: Porównanie wyników operacji przepuklin pachwinowych z użyciem siatki samomocującej z klasycznym zabiegiem metodą Lichten-steina w populacji powiatu kartuskiego (nieopublikowana praca doktorska), promotor: Dr hab. n. med. Wojciech Makarewicz. Gdański Uniwersytet Me-dyczny, Gdańsk, Polska 2017.
[23] Eldin, N. N., and Senouci, A. B. (1993), "Rubber-Tyreparticles as concrete aggregate."Journal of Material inCivil Engineering, ASCE, 5(4), 478-496.
[24] Abboud W, Kamal O, Garcia V, Kluger Y, AbuSalih A. The use of self fixating mesh in open inguinal hernia repair. Madridge J Surg. 2018;1(2):47-51.
[25] Gopal K, Kumar M, Prasad S, Faiz N. Comparative study of use of self- gripping polyester mesh verses suture fixed polypropylene mesh in Lichtenstein hernioplasty in inguinal hernia. Int J Surg Sci. 2020;4(3):226-229.
[26] Rausa E, Asti E, Kelly ME, Aiolfi A, Lovece A, Bonitta G, Bonavina L. Open inguinal hernia repair: a network meta-analysis comparing self- gripping mesh, suture fixation, and glue fixation. World journal of surgery. 2019;43:447-56.
[27] Techapongsatorn S, Tansawet A, Pattanaprateep O, Attia J, Mckay GJ, Thakkinstian A. Cost-effectiveness analysis of mesh fixation techniques for laparoscopic and open inguinal hernia surgeries. BMC Health Services Research. 2022;22(1):1-1.
[28] Shah MY, Raut P, Wilkinson TR, Agrawal V. Surgical outcomes of laparoscopic total extraperitoneal (TEP) inguinal hernia repair compared with Lichtenstein tension-free open mesh inguinal hernia repair: A prospective randomized study. Medicine. 2022;101(26).