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A Prospective Study on Fibrin Glue versus Prolene Sutures for Mesh Fixation in Inguinal Hernias at SBMCH

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ABSTRACT

Introduction: Glue mesh fixations have increased popularity which decreases the operating time reduces postoperative and chronic pain, recurrence and has good local tolerability.

Materials and methodology: This is a prospective study with 82 patients was performed at Sree Balaji Medical College and Hospital in the Department of General Surgery from March 2019 to September 2020. 41 patients underwent suture-mesh fixation and the other 41 patients underwent glue mesh fixation and pain was monitored using the Visual Analogue Scale (VAS).

Results: The pain score reached 0 in glue group at 1 month follow up to 6 months and were comfortable but patients in suture group had persisting discomfort or pain from 1 week follow up to 6 months indicating presence of chronic discomfort or pain in suture group.

Conclusion: Fibrin glue could be a successful alternative to sutures for fixation-of mesh in inguinal hernias.

Keywords: General surgery, Glue mesh fixation, Chronic discomfort

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INTRODUCTION

The mesh is conventionally fixed with sutures. But the limitation with traumatic mesh fixation using sutures is prolonged postoperative and- chronic pain,-discomfort in groin because of strangulation of muscle fibres or severance, compression or irritation of the nerves by the sutures [1]. Therefore many other techniques of mesh fixation like utilisation of absorbable, sutures, self-adhering meshes or the use of glue, were developed in an effort to be able to reduce this issue. These are believed to eliminate nerve entrapment and significant trauma to the nerves [2]. The utilisation of fibrin glue as a different option for mesh, fixation has shown exquisite results. Fibrin glue is a biologically degradable preparation combining human plasma derived fibrin and thrombin with calcium chloride, leads to the formation, of three dimensional structure of cross linked fibrin mimicking the end step of coagulation [3]. In recent years glue mesh fixations have increased popularity which decreases the operating time, reduces postoperative and chronic pain, recurrence and has good local tolerability.

MATERIALS AND METHODS

The study was performed at Sree Balaji Medical College and Hospital in the Department of General Surgery from March 2019 to September 2020. This is a prospective comparative study where the eligible-patients with inguinal hernia are divided into two groups one for suture mesh fixation and the other for glue mesh fixation methods. Every alternate patient was assigned to suture and glue mesh fixation groups.

The aim of this study to compare the outcomes following glue and suture mesh fixation in lichtenstein inguinal hernia repair.

1. Immediate postoperative pain and Chronic pain.

2. Analgesic required.

Pain and analgesia requirement at immediate postoperative period are measured serially at 12 hours, 48 hours, 72 hours, 1 week and 1 month using pain score and the results are compared in both the groups. Chronic post-operative pain at 3 months and 6 months are measured and compared.

Inclusion criteria

- Patients above 18 years of age
- Complete/incomplete hernia
- Unilateral/bilateral
- Direct/indirect
- Uncomplicated inguinal hernias

Exclusion criteria

- Age less than 18 years
- Complicated inguinal-hernias and emergencies
- Recurrent-inguinal hernias
- Laparoscopic inguinal-hernia repair
- Hernias other than inguinal hernias
- Patients on long term analgesic or steroid treatment

A total of 82 patients consented and fulfilled all the criteria and formed a part of the study of which 41 patients underwent suture-mesh fixation and the other 41 patients underwent glue mesh fixation. Pain was monitored using the Visual Analogue Scale (VAS) which was done by a trained staff unaware of the material used which describes pain on-a scale of 0 to 10, with 0 being no pain and 10 being intense unbearable pain and intensity increasing from-0 to 10.

Statistical analysis

Statistical analysis was done with SPSS software. The Pearson *Chi square* test, T test, Leven's test, Mann Whitney U test, Mean, Standard deviation and p value were performed.

RESULTS

A total of 82 patients were a part of this study. Out of 82 patients 41 underwent suture mesh fixation using 2-0 prolene suture and the other 41 underwent fibrin glue mesh fixation in Lichtenstein inguinal hernia surgery.

At 12 hours

The visual analogue scale on an average is 6.7 in suture group and 4.8 in glue group. P-value is less than 0.05. Pain at 12 hours is taken as a baseline score.

At 24 hours

The mean of pain experienced by two groups at 24 hours is 5.4 in Suture group and 3.8 in glue group. There is significant difference between two groups and it is lower in glue group. In glue group 95% of patient's required non opioids and 46.3% required weak opioids. Whereas in suture group 53.7% required non opioids and 46.3% of patients required weak opioids indicating higher analgesia requirement in suture group.

At 48 hours

Visual analogue score is 4.8 in suture group and 2.63 in glue group at 48 hours post-surgery. There is significant reduction in pain scores in both the groups with lesser score in glue group as p value is less than<0.05. At 48 hours post-surgery 17% of patient in glue group required no analgesia and 82.9% required non opioid analgesia. In suture group about 80.5% of patients required non opioid and 19.5% required weak opioid analgesia indicating patients in suture group required higher analgesia than glue group.

At 72 hours

At 72 hours the pain in glue group has reduced to 1 that is almost nearing no distress. There is a reduction in pain score compared to previous values. This is very much less than the suture group rejecting the hypothesis at a significant level ($p<0.05$). The analgesia requirement at 72 hours post-surgery shows suture group required non opioid analgesia whereas in glue group 46.3% of patients did not required analgesia and 53.7% of patient's required non opioid analgesia.

At 1 week

At 1 week post-surgery in both the group has reduced, that is to no pain -0.6 in glue group and minimal discomfort -1.68 in suture group. This result is significant as the p value is less than 0.05. Most of the suture group patients require analgesia at 1 week post-surgery and patients in glue group patients require less or no analgesia compared to the suture group.

At 1 month

Mean pain score is 1.4 in suture group and 0.2 in glue group and this result is significant as p value is less than 0.05.

At 3 months

The pain score at 3 months of follow up is 1.17 in suture group and 0.1 in glue group thus a significant level with p value of 0.00. This indicates that glue group has no pain or discomfort as compared to suture group.

At 6 months

The mean pain score was 1.1 in suture group and 0.07 in glue group. This result is significant as p value is less than 0.05. The analgesia requirement shows the glue group did not require any analgesic. Whereas 78% of patients in suture group did not require analgesia but patients who had chronic groin pain were given non opioids (4.9%), weak opioids for 12.2% and even nerve block for 4.9% indicating suture group is prone to groin pain and discomfort (Figure 1).

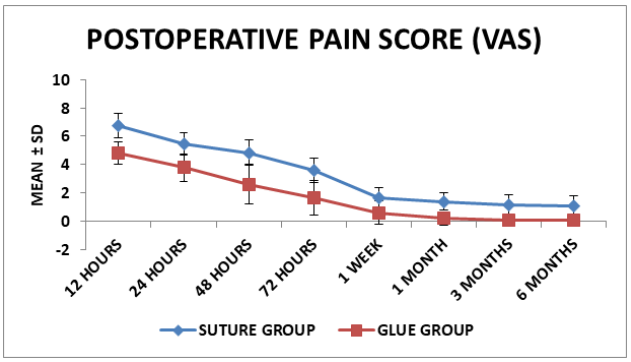

Figure 1: Awareness of dental professionals related to COVID-19 during lockdown.

DISCUSSION

For repair of inguinal-hernia Lichtenstein technique is followed most commonly due to its low side effect rate and recurrences. But the most important complication of chronic pain affects the standard of living of the patient and needs attention. This may be due to injury or entrapment of nerves in groin by traumatic suture fixation of mesh [4]. Chronic-pain in groin is considered as pain in the groin after hernioplasty surgery lasting for more than 3 months that has an impact on the standard of living, that is, ability to going back to work at the earliest, resume standard day to day activities and improvement of baseline pain [5]. To lesser the chronic pain all the three cardinal nerves ideally should be identified and preserved in the hernia surgery or by limiting use of suture and begin the use of atraumatic glue for the fixation of-mesh in the hernia surgeries [6].

Fibrin glue is a biodegradable tissue adhesive that combines human derived fibrin and thrombin activated by calcium chloride to form a matrix that has haemostatic action, provides much power of tensility and enhance fibroblast proliferation [7]. Owing to its good local acceptability and elimination of adverse effects and contraindications, it is-an ideal alternative to sutures.

In this report, pain and discomfort in the patients in glue fixation group was substantially lesser in the-immediate post-operative period. VAS score reached 0 by the end on 1 week follow up in glue group. During the follow up of 1,3 and 6 months pain at distinct time intervals was also noticed to be substantially persisting in suture group and lower in glue group. After 3-months, suture group needed analgesics to cope with the chronic pain [8].

The need of analgesic requirement between both groups was progressively decreasing from early-postoperative period to 6 months follow up. It is noticed that although significant, the analgesia requirement in the early post op period was almost same with both the groups requiring either non opioids or weak opioids. Progressively by 72 hours to 1 week most of the patients in glue group required no analgesia whereas almost all patients in suture group still required analgesia. During follow up by 3 months all patients (100%) in glue fixation group and many patients in suture fixation group (76%) did not require analgesia. However few patients in suture group (26%) developed chronic pain requiring analgesics or even nerve block in one of the patients to alleviate the pain.

A report states that less pain glue group and it reached zero by the end of 1 year follow up but pain or discomfort persisted in suture group. This reported about the analgesia requirement in early post-operative period up to 72 hours and concluded that by 48 hours and 72 hours, the analgesia requirement was 60% and 16% in glue group [9-11]. Whereas in suture group it was 100% during both the periods. This is consistent with this study 17% and 46% of patients at 48 and 72 hours did not require analgesia whereas in suture group 100% required analgesia. Experts [4] concluded reduced pain and numbness in glue-group and the reduction was significant at 1 week and 1 month. Numbness disappeared within 1 year and analgesia requirement was less in glue group.

A study concluded there significantly higher pain within 24 hours in suture group. From 1 week to 3 months follow up there was progressive reduction in pain in suture group but glue group experienced no pain from 1 month post-surgery [12]. They also reported the total dose of analgesia requirement was less in glue group than suture group (1.56 ampoules *vs.* 4.12 ampoules). Another study also showed post-operative pain was less in glue group after 1 week and 1 month and paraesthesia was more in suture group even after 3 months [13]. They described the points to lessen the chronic groin-pain. These include careful identification and protection of nerves, use of light weight meshes reduces the risk of chronic pain from 21.6% to 5.5%. Also atraumatic mesh fixation & careful dissection can leads to the reduction in chronic pain incidence [14].

Negro et al [10] reported that total VAS score was 1.8 in the immediate-postoperative period which shows there was elevated degree of comfort using glue. The variation in pain disappears after 1 month between both the groups. During the follow up the numbness and pain was elevated in suture group. By the end of 3 months differences between both groups vanished but for numbness in suture group. They also reported that during early post-operative-period all patients in glue and suture group required analgesia with most requiring non oipiates, 5 patients and-one patient in suture group requires weak opiates and strong opiates respectively. During 12 month follow up only one patient in glue group required analgesia and 4 patients in suture group required analgesia at first month. After that no patients required analgesia.

Fibrin glue is better than suture mesh fixation. It results in greater durability than suture mesh fixation. It has less biological stress and has advantages compared to other fixation methods [15].

CONCLUSION

A method of a traumatic mesh fixation-using fibrin glue is considered more efficacious, simple and safe as these can result in less tissue damage, nerve injuries, and vessel

trauma and also less operative time, and importantly gives good results with early and chronic post-operative pain and minimal use of analgesics. Hence fibrin glue could be a successful alternative to sutures for fixation-of mesh in inguinal hernias.

REFERENCES

1. Narayanakar RP, Radhakrishna KK, Naik MG, et al. Effectiveness of Fibrin Glue in Comparision to Polypropylene Suture for Mesh Fixation in Lichtenstein Inguinal Hernia Repair. Int Surg J 2019; 6:1305-1311.
2. Sozen S, Cetinkunar S, Emir S, et al. Comparing Sutures and Human Fibrin Glue for Mesh Fixation during Open Inguinal Hernioplasty. Ann Ital Chir 2012; 87:252-256.
3. Goede BD, Klitsie PJ, Kempen BJV, et al. Meta-Analysis of Glue versus Sutured Mesh Fixation for Lichtenstein Inguinal Hernia Repair. Br J Surg 2013; 100:735-742.
4. Bracale U, Rovani M, Picardo A, et al. Beneficial Effects of Fibrin Glue (Quixil) Versus Lichtenstein Conventional Technique in Inguinal Hernia Repair: A Randomized Clinical Trial. Hernia 2014; 18:185-192.
5. Canonico S, Santoriello A, Campitiello F, et al. Mesh Fixation with Human Fibrin Glue (Tissucol) In Open Tension-Free Inguinal Hernia Repair: A Preliminary Report. Hernia 2005; 9:330-333.
6. Fortelny RH, Puchner AHP, Glaser KSG, et al. Use of Fibrin Sealant (Tisseel/Tissucol) In Hernia Repair: A Systematic Review. Surg Endosc 2012; 26:1803-1812.
7. Karigoudar A, Gupta AK., Mukharjee S, et al. A Prospective Randomized Study Comparing Fibrin Glue Versus Prolene Suture for Mesh Fixation in Lichtenstein Inguinal Hernia Repair. Indian J Surg 2016; 78:288-292.
8. Ladwa N, Sajid MS, Sains P, et al. Suture Mesh Fixation versus Glue Mesh Fixation in Open Inguinal Hernia Repair: A Systematic Review and Meta-Analysis. Int J Surg 2013; 11:128-135.
9. Liu H, Zheng X, Gu Y, et al. A Meta-Analysis Examining The Use Of Fibrin Glue Mesh Fixation Versus Suture Mesh Fixation in Open Inguinal Hernia Repair. Dig Surg 2014; 31:444-451.
10. Negro P, Basile F, Brescia A, et al. Open Tension-Free Lichtenstein Repair of Inguinal Hernia: Use Of Fibrin Glue Versus Sutures For Mesh Fixation. Hernia 2011; 15:7-14.
11. Odobasic A, Krdzalic G, Hodzic M, et al. The Role of Fibrin Glue Polypropylene Mesh Fixation in Open Inguinal Hernia Repair. Med Arch 2014; 68:90-93.
12. Sanders DL, Waydia S. A Systematic Review of Randomised Control Trials Assessing Mesh Fixation in Open Inguinal Hernia Repair. Hernia 2014; 18:165-176.
13. Schwab R, Schumacher O, Junge K, et al. Fibrin Sealant for Mesh Fixation in Lichtenstein Repair: Biomechanical Analysis of Different Techniques. Hernia 2007; 11:139-145.
14. Sun P, Cheng X, Deng S, et al. Mesh Fixation with Glue Versus Suture for Chronic Pain and Recurrence in Lichtenstein Inguinal Hernioplasty. Cochrane Database Syst Rev 2017; 2:CD010814.
15. Williams N, Connell PO, McCaskie A, et al. Bailey & Love's Short Practice of Surgery, 27th Edition. Boca Raton: CRC Press. 2018.