

Comparative Study of Mean Operating Time and Hospital Stay in Sutures and Cyanoacrylate Glue Mesh Fixation in Inguinal Hernia Repair

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ABSTRACT

Introduction: The treatment of inguinal hernias is integral to the history and current status of general surgery; evolution in the treatment of inguinal hernias has paralleled technologic developments in the field. Success of groin hernia repair is measured primarily by the permanence of the operation, fewest complications, minimal costs, and earliest return to normal activities. To validate the use of cyanoacrylate glue in fixation of mesh, its comparison to the Lichtenstein's repair with suture fixation of mesh - in these outcomes must be established. The purpose of this study was to compare mean operating time and hospital stay in sutures and cyanoacrylate glue mesh fixation in inguinal hernia repair.

Material and methods: This was a prospective study, conducted over a period of 18 months. After obtaining detailed history, complete general physical and systemic examination, the patients was subjected to relevant investigations. The complete data was collected in a specially designed case recording form. The data collected was transferred into a master chart which is then subjected for statistical analysis.

Results: The mean duration of the total surgery in Suture group was 36.56 ± 2.27 minutes while that in Glue Group was 31.68 ± 3.31 minutes. Significant difference of 4.88 minutes with p value < 0.001 (independent/unpaired t test) was present. In the present study the mean duration of hospital stay was 5.20 ± 2.81 and 4.12 ± 1.83 days respectively in suture and glue group.

Conclusion: The operating time for in glue fixation is lesser. The patients who underwent Glue fixation of mesh had earlier discharge (4.12 days) (painless ambulation) compared to the patients who underwent Suture fixation of mesh (5.20 days)

Keywords: Surgery, Inguinal Hernias, Hospital Stay.

INTRODUCTION

The treatment of inguinal hernias is integral to the history and current status of general surgery; evolution in the treatment of inguinal hernias has paralleled technologic developments in the field. The most significant advances to impact inguinal hernia repair have been the addition of prosthetic materials to conventional repairs and the introduction of laparoscopy to general surgical procedures. The surgical treatment of inguinal hernias has evolved through several stages to reach a modern and successful era.

Even in the present generation suture based repairs like modified bassini and shouldice are still used, they require considerable level of skill to master when compared to Lichtenstein's technique. Similar shortcomes are faced in laparoscopic repairs like TEP (Totally Extraperitoneal

repair) and TAPP (Transabdominal Preperitoneal repair) Which have a very steep learning curve and offer rates of recurrence similar to lichtenstein's repair, while laparoscopic repairs may be indicated in certain conditions, Lichtenstein's repair appears to be the main stay for hernia repair.¹⁻⁴

Success of groin hernia repair is measured primarily by the permanence of the operation, fewest complications, minimal costs, and earliest return to normal activities. To validate the use of cyanoacrylate glue in fixation of mesh, its comparison to the Lichtenstein's repair with suture fixation of mesh - in these outcomes must be established.⁵

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MATERIAL AND METHODS

This prospective study was conducted at MBS hospital, Govt Medical College Kota Rajasthan. Total 50 cases were enrolled in study and divided into 2 groups, with 25 patients in each group. After obtaining detailed history, complete general physical and systemic examination, the patients were subjected to relevant investigations. The complete data was collected in a specially designed case recording form. The data collected was transferred into a master chart which was then subjected for statistical analysis. Patients were selected with following inclusion and exclusion criteria.

Inclusion criteria

- All patients with evidence of primary uncomplicated inguinal hernia admitted in Maharao Bhim Singh

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Hospital.

- Patients above 18 years age.
- Patients undergoing elective Lichtenstein mesh hernioplasty.

Exclusion criteria

- Age less than 18 years
- Patients with recurrent and complicated hernias.
- Emergency inguinal hernia repair.
- Laparoscopic inguinal hernia repair.
- Chronic steroid treatment
- Coagulation disorders
- Ongoing Chemotherapy
- Connective tissue disorders
- Psychological or physical disorders that could affect the ability to feel and elaborate pain

A total of 50 patients were included in study. An informed consent form was taken and patients were counselled about the detailed procedure, merits and demerits of operation. Patients were randomized into two groups (group A and B). Each having 25 patients.

A. Classical Lichtenstein technique

B. Lichtenstein technique with mesh gluing with cyanoacrylate.

The first part of the operation was same in the two groups, according to the original description by Lichtenstein. Inguinal canal was prepared, alongside with the anatomical landmarks – pubic tubercle, conjoined area, inguinal ligament. The hernia sac identified and reduced. The mesh was shaped accordingly and placed in place. In group A the mesh was fixed with one running suture starting from the first stitch passed on the tissue above the pubic tubercle (avoiding the periosteum and with a 2 cm overlap of the mesh above the tubercle) and passed on the inguinal ligament and few interrupted sutures in conjoined area. The two posterior wings of the mesh sutured together using single vicryl stitch to the inguinal ligament.

In Group B the mesh was fixed with n-butyl-2-cyanoacrylate tissue adhesive on the pubic tubercle, the inguinal ligament and the conjoined area. Attention paid to avoid dripping the glue on the nerve. The two posterior wings of the mesh were fixed with glue one by one. All patients had the same polypropylene kind of mesh, irrespective of the fixation method. The fascia closed in both groups with a vicryl running suture. Skin closed with nylon simple/mattress interrupted suture.

All operations performed with spinal block.

The operative time recorded by an operation theater nurse. The operative details recorded in proforma. During postoperative period pain was measured by visual analogue scale (VAS). This compared at Day 1, Day 7, Day 15, 1st month, 3rd month. Approval to carry out the study was sought from the Department of Surgery, M.B.S. Hospital and Govt. Medical College, Kota and Ethics Committee.

STATISTICAL ANALYSIS

Descriptive and inferential statistical analysis has been carried out in the present study. The Statistical software namely SPSS 18.0, and R environment ver.3.2.2 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc

RESULTS

A total of 50 patients were enrolled in this study. They were randomized into two groups Group G and Group S.

Group G: This group included 25 Patients who underwent cyanoacrylate glue fixation of mesh in Lichtenstein's Procedure

Group S: This group included 25 Patients who underwent suture fixation of mesh in Lichtenstein's procedure

Evaluation of all the patients included in the study were done in an identical fashion with respect to history, clinical findings, operative findings and postoperative complications which were in line with the predetermined objectives of the study.

Twenty five patients underwent cyanoacrylate glue fixation of mesh and twenty five patients underwent suture fixation of mesh. All the cases in both the groups were followed up for a minimum period of 3 months.

The patients were followed up at 15 days, one monthly and three monthly intervals for any complication or recurrence. Any recurrence of hernia or death of patient was regarded an end point. The Observations made during the course of the study were as follows.

1. Comparison of operative time

The mean duration of the total surgery in Suture group was 36.56 ± 2.27 minutes while that in Glue Group was 31.68 ± 3.31 minutes. Significant difference of 4.88 minutes with p value < 0.001 (independent/unpaired t test) was present. (Table 1)

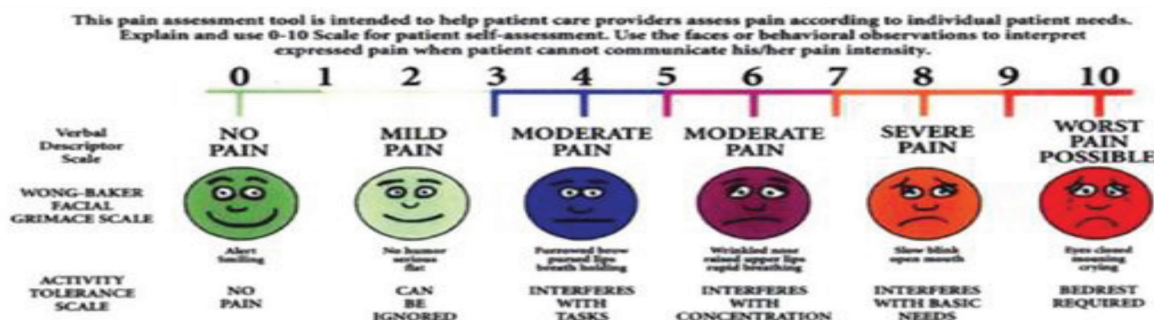


Figure-1: Visual analogue scale

	Group	N	Mean	Std deviation	Independent t test p value	Difference in time in mins
Duration of operation (time taken from skin incision to beginning of mesh fixation in mins)	S	25	24.48	1.873	0.220	0.80
	G	25	23.68	2.610		
Duration of operation (time taken in fixation of mesh in mins)	S	25	5.620	0.600	<0.001	2.36
	G	25	3.260	0.779		
Duration of operation (total duration of the surgery in mins)	S	25	36.56	2.274	<0.001	4.88
	G	25	31.68	3.133		

S - Suture Group; G - Glue Group

Table-1: Comparison of operative time in both groups

Post op hospital stay	Suture Group	Glue Group	Total
1-2	4(16%)	4(16%)	8(16%)
3-6	14(56%)	17(68%)	31(62%)
7-12	6(24%)	4(16%)	10(20%)
>12	1(4%)	0	1(2%)
Total	25(100%)	25(100%)	50(100%)
Mean ± SD	5.20±2.81	4.12±1.83	4.26±2.41

P=0.639, Not significant, chi square test 1.690, df 3

Table-2: Duration of postoperative hospital stay in both groups

	Present Study	Stanislaw et al ⁹	kim-fuch et al ¹⁰
Duration of Hospital Stay (days) (S vs CG)	5.20 vs 4.12	2.06 vs 1.44	3.39 vs 3.35

Table-3: Comparison of duration of hospital stay in various studies

2. Duration of postoperative hospital stay

The mean duration of Postoperative Hospital stay in Suture group was 5.20±2.81 while that in Glue Group was 4.12±1.83, which was statistically not significant with a P Value of 0.639. (Table 2) Though some patients had to stay for prolonged duration due to complications it was not statistically significant as complications occurred in both groups. This may be due to the fact that this study took place in an institution which had government funded scheme which took time (average of 4 days) for approval before surgery (Bhamasah Yojana). Hence the hospital stay was nearly similar in the two groups studied.

DISCUSSION

Inguinal hernia is the most common surgical abdominal entity in adults.⁵ In the past decade Lichtenstein repair has become the gold standard for treatment of inguinal hernias mainly due to the reduction in recurrences noted and due to the reproducibility of the procedure.⁶ It is used as a gold standard surgery for all types and sizes of inguinal hernia with very few exceptions. One of the most crucial criteria for successful modern inguinal hernia repair is short recovery time combined with postoperative pain as minor as possible. Despite the evident advancement in the domain, these goals are still unachievable. The occurrence of postoperative chronic pain is especially disturbing as it is felt by 0-43% of patients, 11% on average.⁷

Operating time: In the present study the mean time difference between the Suture group and Glue group with

respect to operative time in the current study is 4.88 minutes. The duration of surgery was shorter in the Glue group. The mean time difference in Kim-Fuchs et al was 7 minutes, other studies showed minimal time differences favouring Glue fixation (Nowobilski et al⁸⁷, Paajanen et al⁸⁸, Testini et al⁸⁹, Wong et al⁹⁰, Campanelli et al.⁸

Comparison of duration of hospital stay: In the present study the mean duration of hospital stay was 5.20±2.81 and 4.12±1.83 days respectively in suture and glue group. The comparison of these parameters with other studies was not possible due to the different operational definitions of these variables in different studies. This is due to the fact that the present study is an institutional study and patients in both the groups had to wait for a similar number of days for the government scheme to get approved and hence days of hospital stay were almost the same in both the groups. However a common trend of earlier mobilization and discharge was noted in GLUE group in all the studies. (TABLE 3)

The duration of hospital stay depends on a variety of factors including patients wish, cost of hospital stay, doctors advice etc. and hence duration of hospital stay is highly variable. Now we are in an era in which inguinal hernia repairs are done as a daycare procedure at many hospitals and hence not much importance is given to total number of days of hospital stay.

CONCLUSION

The present study comparing suture fixation of mesh in

Lichtenstein's repair with cyanoacrylate glue fixation of mesh in Lichtenstein's repair for inguinal hernia came out with the conclusions that the operating time for glue fixation is lesser and the patients who underwent Glue fixation of mesh had earlier discharge (painless ambulation) compared to the patients who underwent Suture fixation of mesh.

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