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Original Research Article

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

Background: Hernia is a protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity. A hernia is the bulging of part of contents of the abdominal cavity through a weakness in the abdominal wall. Inguinal hernia repair is the most frequently performed operation in any general surgical unit. To compare the mean operating time and total duration of hospital stay between sutures and cyanoacrylate glue mesh fixation in inguinal hernia repair in a medical college setup.
Methods: All patients presenting to B.L.D. E. U's Shri B. M. Patil Medical College Hospital and Research Centre Bijapur and admitted patients in whom the diagnosis of primary inguinal hernia is considered from October 2013 to June 2015.
Results: Operating time was significantly less that is 36.52 min in cyanoacrylate group and 48.32 in suture fixation group. Hospital stay in cyanoacrylate group was 4.82 days and in suture fixation group was 6.48 days. Two days is considered as preoperative work up period in both the groups as it is a medical college setup.
Conclusions: Lichtenstein tension free hernioplasty is always better option if mesh fixation done with N-butyl cyanoacrylate when compared with Lichtenstein's tension free hernia repair with standard prolene suture fixation.

Keywords: Cyanoacrylate glue, Hospital stay, Operating time

INTRODUCTION

Hernia is a protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity.[1] A hernia is the bulging of part of contents of the abdominal cavity through a weakness in the abdominal wall.[2] Inguinal hernia repair is the most frequently performed operation in any general surgical unit.[3] Hernioplasty is most commonly performed surgery for hernia. Mesh fixation is a major step in hernioplasty regularly mesh is fixed with non-absorbable prolene sutures as there is longer operative time, more pain during post-operative period and foreign body sensation, sutures are replaced by n-butyl-2-cyanoacrylateglue mesh fixation in Lichtenstein hernia repair. Evidence of surgical repair of inguinal hernias can be traced back to civilizations of ancient Egypt and Greece.[4] In 1989, repair for inguinal hernia was first described by Lichenstein.[5] The original cyanoacrylates (the chemical name for the glue) were discovered in 1942 in a search for materials to make clear plastic gun sights during World War II, when a team of scientists headed by Harry Coover Jr. stumbled upon a formulation that stuck to everything that it came in contact with; it was rejected for the application. In 1951 cyanoacrylates were rediscovered by Eastman Kodak researchers Harry Coover Jr. and Fred

Joyner, who recognized their true commercial potential; "Eastman #910" (later "Eastman 910") was the first cyanoacrylate adhesive to be sold, in 1958.[6]

Complications associated with sutured mesh fixation following open groin hernia repair, such as chronic irritation and pain are probably due to tension or nerve compression by sutures hence these complications have prompted surgeons to use atraumatic method of fixation by cyanoacrylate glue.[7]

Post-operative duration is a crucial factor in determine the success of surgery.[8] The early discharge of patient and less postoperative pain helps in early ambulation and early return to work. Hence the recent advances and surgical techniques focus on this aspect at the same time attaining surgical correction.

Introduction of glue to the surgical fixation of mesh has a lot of importance in reduction of operating time and the rate of complications. It has also reduced the postoperative pain and has helped in early discharge of patients.

METHODS

Source of data

All patients presenting to B. L. D. E. U's Shri B. M. Patil Medical College Hospital and Research Centre Bijapur and admitted patients in whom the diagnosis of primary inguinal hernia is considered from October 2013 to June 2015

Collection of data

Two groups are made, standard suture fixation for one group and glue fixation to another group. Minimum of 50 cases with permissible error in each group was taken up for the study.

Diagnosis of unilateral primary uncomplicated indirect and direct inguinal hernia was made on the basis of thorough clinical examination, appropriate laboratory and radiological investigations. A pretested structural proforma was used to collect relevant information for each individual patient selected. Cases was selected consequently with following inclusion and exclusion criteria.

Inclusion criteria

Men 20 years of age or older with unilateral/bilateral primary inguinal hernia.

Exclusion criteria

- Any recurrent hernias.
- Presence of bowel obstruction, strangulation, peritonitis or perforation.
- Associated femoral hernia.
- Patients undergoing orchidectomy in the same procedure.

Follow up

Operating time, hospital stay for suture fixation mesh was fixed to the pubic tubercle, inguinal ligament and conjoint tendon by standard prolene 2-0.

For cyanoacrylate fixation group mesh was fixed to the pubic tubercle, inguinal ligament and conjoint tendon by (ENDOCRYL) that is N-butyl cyanoacrylate glue.

A single dose of Inj. Ceftrioxone + Sulbactam 1.5gm was given intravenously immediately before the surgery. The note was taken of the contents of the sac, and any technical difficulty encountered during the surgery. Postoperatively patient was put on *i.v* antibiotics and pain killers.

RESULTS

The mean operating time required for the glue fixation is 36.52±3.1 minutes. The sutures were placed on pubic symphysis and the upturned portion of the inguinal ligament and conjoint tendon. The sutures were prolene 2-0. In the glue fixation technique about 0.5ml of glue is used to fix the mesh at the pubic tubercle, inguinal ligament and conjoint tendon. The mean operating time required for the suture fixation is 48.32±5.9 minutes. The glue fixation took 12 minutes less than suture fixation for mesh hernioplasty. There is a statistically significant difference between the two procedures for the mean operating time required.

Table 1: Comparison of operating time between two procedures.

	Hernioplasty with glue fixation		Lichtenstin's hernioplasty with sutures		P value
Operating time (min)	**Mean**	**SD**	**Mean**	**SD**	<0.001*
	36.52	3.11	48.32	5.93	

Table 2: Comparison of mean duration of hospital stay between two procedures.

	Hernioplasty with glue fixation		Lichtenstin's hernioplasty with sutures		P value
Hospital stay (days)	**Mean**	**SD**	**Mean**	**SD**	<0.001*
	4.82	1.30	6.48	1.39	

* Significant with p<0.05

The mean duration of hospital stay required for the glue fixation is 4.82±1.3 days. The patients who were operated with glue fixation has lesser incidence of seroma

formation of hematoma and postoperative pain. The mean duration of hospital stay required for the suture fixation is 6.48±1.39days. The patients operated with sutures for mesh fixation had a hospital stay of 2 days more compared to the patients who had glue fixation. There is a statistically significant difference between the two procedures for mean duration of hospital stay.

Following surgery for inguinal hernia, patients were discharged at various duration of stay in postoperative period. The stay in post-operative period ranged from 3days to 10 days. All cases were discharged during this time with 0 mortality. In our study we observed that 76% of the cases with glue fixation technique were discharged in 4th to 6th day postoperatively. Whereas only 42% of the cases with suture fixation could be discharged during that time.

Table 3: Distribution of the subject according to duration of hospital stay between two procedures.

Hospital stay (Day)	Cases - hernioplasty with glue fixation [n (%)]	Control - Lichtenstin's hernioplasty with sutures [n (%)]	Total	χ^2value	p value
1-3	9 (18)	1 (2)	10 (10)	36.46	0.001*
4-6	38 (76)	21 (42)	59 (59)		
7-9	3 (6)	28 (56)	31 (31)		
Total	50(100)	50(100)	100 (100)		

Table 4: Comparison of duration of hospital stay with other studies.

Mariotestini et al (Mean duration in days)		Palanivelu et al (Mean duration in days)		Kim-Fuchs et al (Mean duration in days)		Present study (Mean duration in days)	
Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls
1.33 days (32 hrs)	1.36 days (32.6hrs)	3.4	3.4	< 1day (17 hrs)	< 1 day (17 hrs)	4.82	6.48
Not significant		Not significant		Not significant		Significant difference in operating time duration	

Table 5: Comparison of operating time with other studies.

Mariotestini et al (Mean duration in min)		Palanivelu et al (Mean duration in min)		Kim-Fuchs et al (Mean duration in min)		Present study (Mean duration in min)	
Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls
54.2	54.5	73	79	40.7	41.5	36.52	48.32
Not significant		Significant difference in time duration		Not significant		Significant difference in operating time duration	

Author also noted in our study that more than 28 cases of hernia repair with sutures were discharged in 7th to 9th postoperative day whereas with glue fixation technique only 3 had to be admitted till day 7. Clearly present study shows that patient who underwent inguinal hernia repair with glue fixation could discharged early and with less postoperative complications.

DISCUSSION

In this study author observed that the mean operating time required for the glue fixation is 36.52±3.1 minutes the mean operating time required for the suture fixation is 48.32±5.9 minutes.

There is a significant difference in mean operating time between the two procedures. The glue fixation took 12 minutes less than suture fixation for mesh hernioplasty. Operating time in glue significantly less than suture fixation for mesh hernioplasty.

In study by palanivelu et al the time required for glue fixation is 73 min whereas with sutures time taken for surgery was found to be 79min. In their study they found that it took 6min lesser with glue fixation than with sutures which was statistically significant and hence concurring with our findings. In previously done studies mean operating time in glue fixation was 54.2min, 40.7min, whereas with sutures time taken for surgery was found to be 54.5min, 41.5min receptively in those two studies. No significant difference in mean operating time between the two procedures and this study are not concurring with the finding.[9-10]

In this study the mean duration of hospital stay with glue fixation was 4.82 days whereas with sutures it was 6.48 days. Author found that there was significant change in duration of hospital stay with regard to glue fixation versus sutures for inguinal hernia repair. There was significant reduction in hospital stay with regard to glue fixation. However, in other studies it was noted that there

was no significant change in duration of stay with both sutures and glue fixation technique.[9-10]

CONCLUSION

In this study of comparison between use of N butyl cyanoacrylate glue versus prolene suture mesh fixation in Lichtenstein hernia repair, we found that out of total 100 patients, 50 in N butyl cyanoacrylate group and 50 in standard prolene suture mesh fixation group. Operating time is significantly reduced in glue fixation group compared to standard prolene fixation and hospital stay in cases group was 4.82 days and in control group was 6.48 days.

Hence Lichtenstein tension free hernioplasty is always better option if mesh fixation done with N butyl cyanoacrylate when compared with Lichtenstein's tension free hernia repair with standard prolene suture fixation.

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REFERENCES

1. Mark A, Malangoni, Rosen MJ. Sabiston textbook of surgery 2, 19th Ed. Saunders;2012:1114-5.
2. Nixon SJ, Bruce T. Abdominal wall, hernia and umbilicus. Bailey and love's 26th Edition. 2013:948.
3. Rutkow IM, Robbins AW. Demographic, classificatory, and socioeconomic aspects of hernia repair in the United States. Surgical Clinics of North America. 1993 Jun 1;73(3):413-26.
4. Sherman V, Macho JR, Brunicardi FC. Inguinal hernias. Schwartz's principles of surgery. 9th Edition. McGraw-Hill Professional; 9 ed;2009:1339-40.
5. Kim-Fuchs C, Angst E, Vorburger S, Helbling C, Candinas D, Schlumpf R. Prospective randomized trial comparing sutured with sutureless mesh fixation for Lichtenstein hernia repair: long-term results. Hernia. 2012 Feb 1;16(1):21-7.
6. Wound Adhesives, 2 Octylcyanoacrylate. Available at: www.emedicine.com. Accessed 12 April 2005.
7. Nienhuijs S, Staal E, Strobbe L, Rosman C, Groenewoud H, Bleichrodt R. Chronic pain after mesh repair of inguinal hernia: a systemic review. Am J Surg. 2007;194:394-400.
8. Hetzer FH, Hotz T, Steinke W, Schlumpf R, Decurtins M, Largiader F. Gold standard for inguinal hernia repair: shouldice or Lichtenstein? Hernia. 1999;3:117-20.
9. Testini M, Lissidini G, Poli E, Gurrado A, Lardo D, Piccinni G. A single-surgeon randomized trial comparing sutures, N-butyl-2 cyanoacrylate and human fibrin glue for mesh fixation during primary inguinal hernia repair. Can J Surg. 2010;53(3):155.
10. Kim-Fuchs C, Angst E, Vorburger S, Helbling C, Candinas D, Schlumpf R. Prospective randomized trial comparing sutured with sutureless mesh fixation for Lichtenstein hernia repair: long-term results. Hernia. 2012 Feb 1;16(1):21-7.

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