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Original Research Article

Cynoacrylate surgical glue as an alternative to suturing for mesh fixation in lichtenstein hernia repair

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ABSTRACT

Background: Tension free repair using mesh in open hernia repair has become more popular in recent years. Chronic pain remains a frequent complication after Lichtenstein inguinal hernia repair. The use of sutures to fix the mesh has been implicated. Fixing the mesh using cynoacrylate glue could avoid this complication. The purpose of the present study is to study the incidence of pain and other complications following inguinal hernia repair performed by the Lichtenstein technique with mesh fixation by cyanoacrylate surgical glue.
Methods: T This study was conducted at tertiary care hospital. Inclusion criteria were all patients coming to the hospital with inguinal or inguinoscrotal hernias diagnosed clinically. Exclusion criteria were all complicated inguinal hernia namely obstructed, strangulated, and large hernias with scrotal abdomen, recurrent hernia. Patient not fit for surgery or not consenting to join the study. The patients will be informed about the surgery and thereafter requested to sign an informed consent. Primary outcome was postoperative pain. Secondary endpoints were operating time, surgical site infection and recurrence rate.
Results: Total number of 31 cases enrolled in the study of which twenty-two had unilateral and seven had bilateral inguinal hernias. Average pain score on POD 1, 3, 7 was 5.75; 4.53; 3.32 respectively. One patient developed seroma which was managed conservatively. No evidence of recurrence during study period.
Conclusions: Cyanoacrylate surgical glue is a reliable method and can be used as an alternative for conventional Lichtenstein hernia repair.

Keywords: Cynoacrylate glue, Hernia lichtenstein hernia

INTRODUCTION

The Lichtenstein technique is a standard procedure for open tension-free inguinal hernia repair performed using meshes to strengthen the posterior wall of inguinal canal. Tension free repair using mesh in Lichtenstein inguinal hernia surgery has led to a substantial decrease in hernia recurrence. The prevalence of postoperative pain after open and laparoscopic procedures has been reported to be as high as 30%. Estimate is that 12% of patients feel themselves to be restricted in their daily activities because of pain.[1,2] Conventionally, the mesh is secured by either sutures or staples. Despite the ‘‘tension-free’’ nature of these hernioplasties, sutures and staples may strangulate muscle fibers, compress regional nerves, or give rise to incapacitating pain or dysesthesia.[3] Complications associated with sutured mesh fixation following open groin hernia repair have prompted surgeons to evaluate methods of atraumatic fixation, such as the use of human fibrin glue. Fibrin glue is a biodegradable adhesive combining human-derived fibrinogen and thrombin that replicates the last step of the

coagulation cascade. It has been used with excellent local tolerability and relative lack of adverse effects. Its adhesive and hemostatic properties have been demonstrated in a number of experimental studies and clinical trials.[3-6] The aim of present study is to observe the postoperative pain and postoperative complications like seroma, hematoma, wound gapping, chronic pain, recurrence when mesh is fixed by using cynoacrylate surgical glue in inguinal hernioplasty done by the Lichtenstein technique.

METHODS

Study population includes all the patients with groin hernia attending surgical outpatient department or those admitted to hospital during the study period. Informed consent was sought from all patients with ethical clearance from the IEC.

The subjects were included according to the following inclusion and exclusion criteria. Inclusion criteria are patients above the age of 18 years. All patients coming to the hospital with inguinal or inguinoscrotal hernia diagnosed clinically with features such as swelling with cough impulse, reducibility and getting above the swelling not possible. Exclusion criteria are all complicated inguinal hernia namely obstructed, strangulated, and large hernias with scrotal abdomen, recurrent hernia.

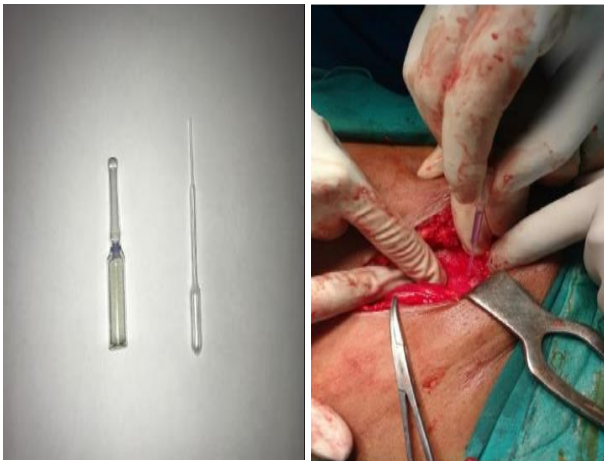

Figure 1: Ampule containing cynoacrylate glue along with dropper and mesh fixation with cyanoacrylate surgical glue.

Patient not fit for surgery or not consenting to join the study. Once the diagnosis of inguinal hernia was confirmed, all patients were subjected to preoperative assessment including basic laboratory investigations and pre-anaesthetic work up done.

Cynoacrylate surgical glue alone was sufficient for polypropylene mesh fixation, without the need for additional sutures. Cynoacrylate surgical glue was applied with dropper (Figure 1).

Outcome of the present study are immediate post-operative pain- The intensity of inguinal pain was assessed using a Visual Analogue Scale (VAS), ranging from 0= no pain to 10= worst pain at hospital discharge to determine early postoperative pain. post-operative complications.

Wound gaping was considered when there was separation of the wound edges. Seroma was considered when there was collection of only serous fluid in the subcutaneous tissue of the operative wound without any evidence of infection, chronic pain, recurrence was assessed.

RESULTS

A total of 31 patients were enrolled in study to observe the consequences after hernia repair done by Lichtenstein technique with the cynoacrylate surgical glue. The observations are as follows: Out of the 31 cases enrolled, maximum number of patients belonged to the 6th decade which were 12 (38.7%) (Table 1).

Table 1: Age distribution of patients.

Age group (years)	Number of patients (percentage)
40-50	7(22.5)
>50-60	12(38.7)
>60-70	10(32.3)
>70	2(6.5)
Total	31(100)

Mean age was 55.61±9.182 years and range were 40 to 71 years. All patients enrolled in the study were male. Among 31 patients 15(48.4%) patients had right sided, 7(22.6%) had left sided and 9(29.0%) patients had bilateral inguinal hernia (Table 2).

Table 2: Side of Hernia.

Side of hernia	Number of patients (percentage)
Right	15(48.4%)
Left	7(22.6%)
Bilateral	9(29.0%)
Total	31(100%)

Eleven (35.5%) of the patients had direct type while 20 (64.5%) had indirect type of hernia. The mean operative time observed was 100.48±29.98 minutes and range was between 60 to 160 minutes. The post-operative pain scores were analysed using the Visual Analogue Scale. The mean post-operative pain score on post-operative day 1, 3, 7 were 5.71±1.189, 4.55±1.179, 3.35±1.253 respectively.

The mean follow-up duration (in months) was 13±9.004. Early complications included seroma and wound gaping, in the present study, 1 patient (3.2%) developed a seroma and was managed with conservative treatment. Chronic groin pain at 3 months was seen in 1 patient (3.2%). No

recurrence was observed in any of the patients who were included in the study till date.

DISCUSSION

Post-operative pain

The mean postoperative day 1 pain scores in conventional Lichtenstein hernia repair on literature review was 5.79, whereas in present study mean postoperative day 1 pain scores was 5.71.[7-11] The mean postoperative day 7 Pain Scores in conventional Lichtenstein hernia repair on literature review was 4.45, whereas in present study mean postoperative day 7 pain scores was 3.35.[8-11]

Post-operative complications

In the present study early, postoperative complication was seen in 1 patient (3.2%) in the form of seroma. The incidence of seroma in literature is 1-12% in Lichtenstein group. The mean postoperative complication in conventional Lichtenstein hernia repair on literature review was 4.57%, whereas in present study mean postoperative complication was 3.2%.[7-11]

The mean chronic pain in conventional Lichtenstein hernia repair on literature review was 6.87, whereas in present study mean chronic pain was 3.2%.[8-11] The mean recurrence in conventional Lichtenstein hernia repair on literature review was 1.20 %, whereas in present study mean recurrence was 0%.[7-11]

On comparing the results of present study with literature on conventional Lichtenstein repair we can conclude that cyanoacrylate surgical glue is a reliable method and can be used as an alternative for conventional Lichtenstein hernia repair.

Fixation of mesh with the cyanoacrylate surgical glue appears to be a good alternative to conventional fixation of mesh by prolene suture, considering these results well planned Randomised Control Trial is a next step to obtain level 1 inference after calculation of sample size with comparision group and blinding. Limitations of the present study are follow up was done for short duration (men follow up duration was done for 13 months and so long-term complications were not observed.

CONCLUSION

Cyanoacrylate surgical glue is a reliable method and can be used as an alternative for conventional Lichtenstein hernia repair with respect to post operative pain, surgical site infection and recurrence rate.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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