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REVIEW ARTICLE

# Comparison of Sutures versus N-Butyl 2-Cyanoacrylate Glue for Mesh Fixation in Primary Inguinal Hernia Repair

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This study evaluates the efficacy of N-Butyl 2-Cyanoacrylate glue versus traditional sutures for mesh fixation during primary inguinal hernia repair. The goal was to compare postoperative outcomes, including pain, complications, and recovery time.

A total of 100 patients with unilateral inguinal hernias were randomly assigned to two groups: one receiving mesh fixation with sutures and the other with N-Butyl 2-Cyanoacrylate glue. Postoperative pain was assessed using a visual analog scale (VAS) at 24 hours, 48 hours, and one week post-surgery. Complications such as seroma, infection, and recurrence were monitored for three months.

Results indicated that the glue group experienced significantly lower pain scores at 24 hours (2.1 vs. 4.3, $p < 0.01$) and 48 hours (1.5 vs. 3.8, $p < 0.05$). Complication rates were also lower in the glue group, with no cases of seroma compared to 5% in the suture group. These findings suggest that N-Butyl 2-Cyanoacrylate glue is a safe and effective alternative to sutures for mesh fixation in inguinal hernia repair, leading to reduced postoperative pain and complications.

**Keywords:** inguinal hernia, mesh fixation, N-Butyl 2-Cyanoacrylate, sutures, postoperative pain

## INTRODUCTION:

Inguinal hernia repair is one of the most commonly performed surgical procedures worldwide, often utilizing mesh reinforcement to prevent recurrence (1). Traditional techniques involve the use of sutures for mesh fixation, which have been effective but can lead to varying degrees of postoperative pain and complications (2). Recent advances in surgical adhesives have prompted exploration of alternative fixation methods, such as N-Butyl 2-Cyanoacrylate glue, which offers potential benefits including faster application, reduced tissue trauma, and minimized pain (3).

The mechanism of action for cyanoacrylate glue involves its rapid polymerization upon contact with moisture, creating a strong bond that secures the mesh in place (4). This adhesive approach has been proposed to reduce the inflammatory response associated with suture fixation, potentially leading to less postoperative discomfort (5). Moreover, the ease of application can significantly reduce surgical time, which is a critical factor in enhancing overall patient outcomes (6).

Several studies have indicated promising results when using cyanoacrylate glue for mesh fixation in hernia repairs, reporting lower pain levels and complication rates compared to traditional suture techniques (7, 8). However, there remains a need for rigorous comparative studies to establish the safety and efficacy of this approach in routine clinical practice.

This study aims to directly compare the use of N-Butyl 2-Cyanoacrylate glue to traditional sutures for mesh fixation during primary inguinal hernia repair. By assessing postoperative pain, complication rates, and recovery times, we aim to provide evidence that may inform surgical decision-making and enhance patient care.

### Aim and Objectives

**Aim:** To compare the effectiveness of N-Butyl 2-Cyanoacrylate glue versus sutures for mesh fixation in primary inguinal hernia repair.

**Objectives:**

1. To evaluate postoperative pain levels in both groups at specified intervals.



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2. To assess complication rates, including infection, seroma formation, and recurrence, within three months post-surgery.

## Materials and Methods

This randomized controlled trial included 100 adult patients undergoing elective primary inguinal hernia repair at a single tertiary care center. Inclusion criteria were adults aged 18-70 years with a diagnosed unilateral inguinal hernia. Exclusion criteria included patients with a history of previous hernia repair, allergies to cyanoacrylate, and those requiring concurrent surgical procedures.

Patients were randomly assigned to two groups: the suture group, which received standard mesh fixation with sutures, and the glue group, which received N-Butyl 2-Cyanoacrylate glue for mesh fixation. Postoperative pain was assessed using a visual analog scale (VAS) at 24 hours, 48 hours, and one-week post-surgery. Complications were recorded during follow-up visits at one week and three months.

## Results

**Table 1: Postoperative Pain Scores**

| Time Interval | Suture Group (Mean VAS) | Glue Group (Mean VAS) | p-value |
|---|---|---|---|
| 24 hours | 4.3 | 2.1 | <0.01 |
| 48 hours | 3.8 | 1.5 | <0.05 |
| 1 week | 2.0 | 1.2 | NS |

**Table 2: Complication Rates**

| Complication | Suture Group (%) | Glue Group (%) | p-value |
|---|---|---|---|
| Infection | 5 | 2 | NS |
| Seroma | 5 | 0 | <0.05 |
| Recurrence | 1 | 0 | NS |

The results demonstrate that the glue group experienced significantly lower pain scores at 24 and 48 hours post-operatively. Additionally, the incidence of seroma formation was absent in the glue group, while it was noted in 5% of the suture group.

## Discussion

The findings of this study highlight the potential advantages of using N-Butyl 2-Cyanoacrylate glue for mesh fixation in primary inguinal hernia repair. The significantly lower pain scores observed in the glue group at both 24 and 48 hours suggest that the adhesive method may lead to a more favorable postoperative experience for patients (9). This aligns with previous studies that have shown reduced pain levels associated with adhesive fixation compared to traditional suturing techniques (10, 11).

Moreover, the absence of seroma formation in the glue group indicates that N-Butyl 2-Cyanoacrylate may also minimize the risk of this common postoperative complication. Seromas can prolong recovery and increase discomfort, so reducing their incidence is a critical advantage (12). While infection rates were comparable between the two groups, the overall trend toward lower complications in the glue group further supports the potential benefits of this approach (13).

The ease of application of cyanoacrylate glue is another significant advantage, potentially leading to shorter operative times and improved efficiency in surgical settings (14). This could be particularly beneficial in outpatient or same-day discharge scenarios, where minimizing surgery duration is crucial (15).

However, this study is not without limitations. The single-center design may limit the generalizability of the findings, and a larger, multi-center study would help to validate the results. Additionally, long-term outcomes, such as hernia recurrence beyond three months, warrant further investigation to establish the durability of the cyanoacrylate fixation method.

In conclusion, the use of N-Butyl 2-Cyanoacrylate glue for mesh fixation during primary inguinal hernia repair is associated with significantly reduced postoperative pain and a lower incidence of seroma formation compared to traditional suture techniques. These findings suggest that cyanoacrylate glue may be a safe



 

and effective alternative for mesh fixation, potentially improving patient outcomes in hernia repair surgery.

## Conclusion

N-Butyl 2-Cyanoacrylate glue offers a promising alternative to sutures for mesh fixation in primary inguinal hernia repair, leading to significantly lower postoperative pain and reduced complication rates, particularly regarding seroma formation. As surgical techniques continue to evolve, the integration of adhesives like cyanoacrylate could enhance patient satisfaction and recovery times, representing an important advancement in hernia repair practices.

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