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Incisional hernia, Primary hernia

N-BUTYL-2-CYANOACRYLATE TISSUE ADHESIVE VERSUS SUTURES FOR SUBLAY MESH FIXATION IN VENTRAL HERNIA REPAIR: A RANDOMISED CONTROLLED TRIAL

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BACKGROUND

Sublay meshplasty is the standard technique in open ventral hernia repair. While suture fixation is conventional, **N-Butyl-2-cyanoacrylate tissue** adhesive has gained interest as an alternative method for mesh fixation, with **reported advantages that include**:

- Faster and simpler application
- Lower postoperative pain
- Comparable safety
- Potential cost-effectivenessAlthough studied in laparoscopic and inguinal hernia repair, **its role in open sublay mesh fixation remains under explored**. This study evaluates tissue adhesive as an alternative to sutures in this setting.

AIM

To compare tissue adhesive versus sutures for mesh fixation in open sublay ventral hernia repair in terms of:

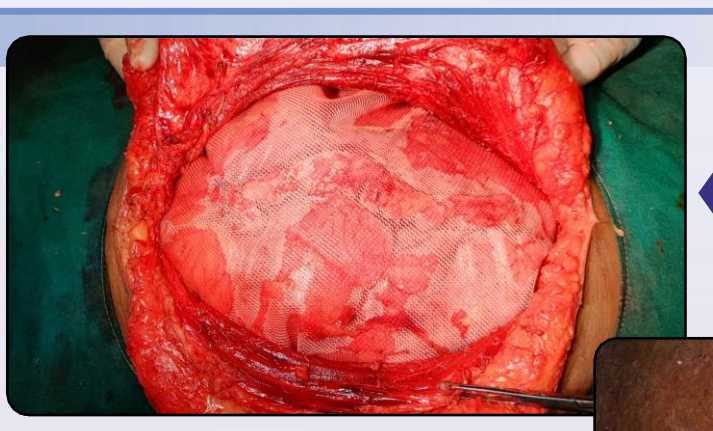
- Mesh fixation time
- Postoperative pain
- Postoperative mobilization
- Complication rates (seroma, surgical site infection)
- Cost and discharge outcomes

MATERIALS & METHODS

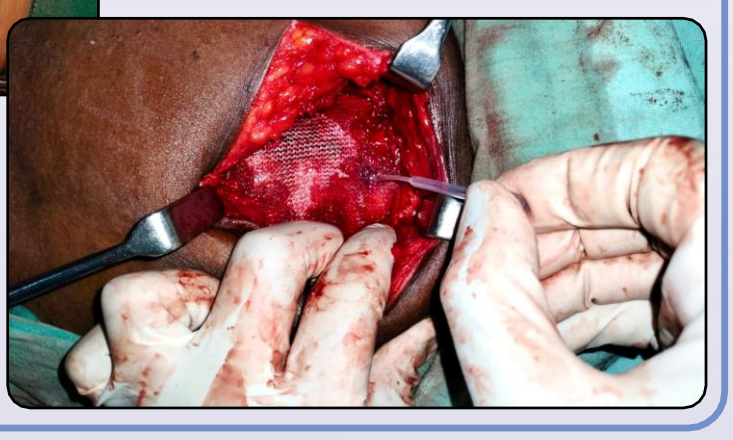
- **Study design:** Prospective randomized controlled trial
- **Setting:** Department of General Surgery, IGGMC Nagpur
- **Participants:** 76 patients with ventral hernia, randomized into two groups (n = 38 each):
  Group A: Mesh fixation using N-Butyl-2-cyanoacrylate tissue adhesive
  Group B: Mesh fixation using interrupted 2-0 polypropylene sutures

Outcomes measured:

- Mesh fixation time (minutes : seconds)
- Postoperative pain (VAS score on POD 4)
- Time to ambulation (hours)
- Incidence of seroma and surgical site infection
- Day of discharge
- Fixation material cost (in EUR)



Completed sublay meshplasty with retrorectus dissection. Polypropylene mesh positioned in the retromuscular plane prior to fixation.

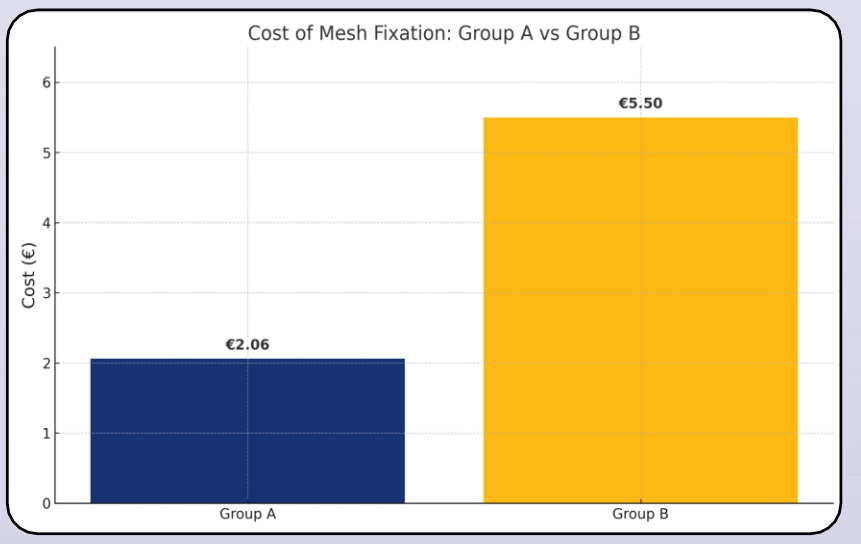


Intraoperative application of N-Butyl-2-cyanoacrylate tissue adhesive for mesh fixation in the retrorectus plane.

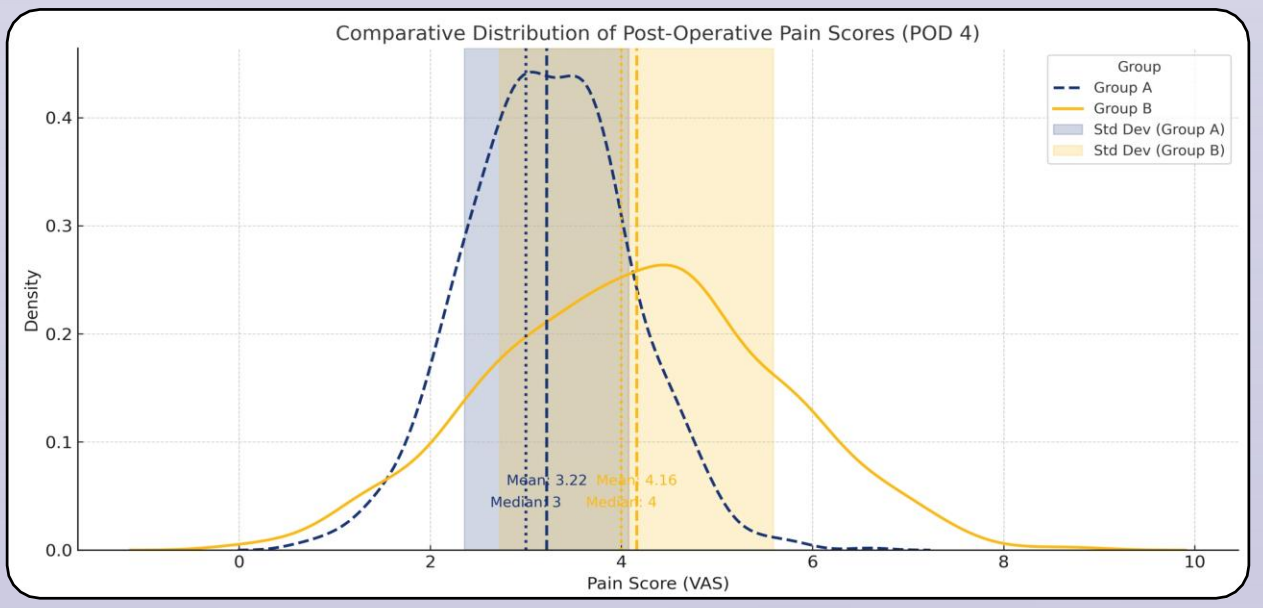
RESULTS

- Mesh fixation time was nearly **7 minutes shorter in Group A**.
- Group A had **lower VAS pain scores on POD 4**.
- **Cost of fixation was less than half in Group A** compared to Group B.
- No statistical difference was seen in mobilization, seroma, surgical site infection, or discharge timing.

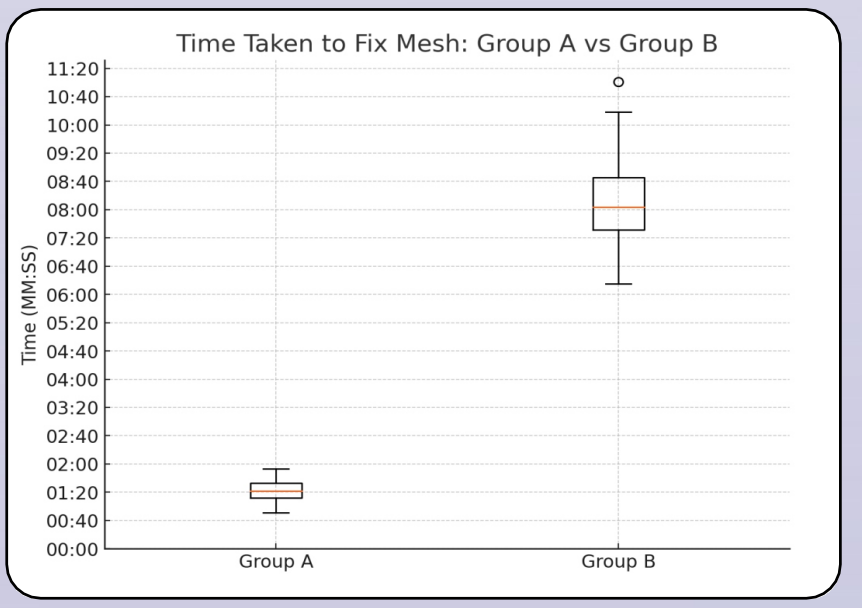
Parameter	Group A (Tissue Adhesive)	Group B (Sutures)	p-value
Mesh fixation time (MM:SS)	01:23 - 00:17	08:13 - 01:07	< 0.001
Post-op pain score (VAS, POD 4)	3.22 - 0.86	4.16 - 1.43	< 0.05
Material cost (EUR)	2.06	5.50	< 0.001
Post-op mobilization (hours)	9.15 - 6.93	9.94 - 7.76	0.64
Seroma (n = 38)	2/38	3/38	0.89
Surgical site infection (n = 38)	1/38	1/38	1.00
Discharge (POD)	4 (mean, median)	5 (mean), 4 (median)	0.34



Mean cost of mesh fixation was significantly lower in the tissue adhesive group (Group A) compared to the suture group (Group B). ($p < 0.001$)



Mean postoperative pain score on POD 4 was significantly lower in the tissue adhesive group (Group A) compared to the suture group (Group B), as demonstrated by this density plot. ($p < 0.001$)



Mesh fixation time was significantly shorter in the tissue adhesive group (Group A) compared to sutures (Group B), as shown in this box plot. ($p < 0.001$)

CONCLUSION

N-Butyl-2-cyanoacrylate tissue adhesive is a safe and effective alternative to sutures for mesh fixation in open sublay ventral hernia repair, offering:

- Shorter mesh fixation time
- Lower postoperative pain
- Reduced material cost
- Comparable complication and recovery profiles
- Practical advantages in high-volume or resource-limited settings

QR CODE

Scan to access:

- Video demonstration of mesh fixation using N-Butyl-2-cyanoacrylate tissue adhesive
- Full thesis (RCT, n = 64)
- Author contact information