Comparative Study of the Effectiveness of the Octyl-2-Cyanoacrylate as a Tissue Adhesive for Skin Closure & Skin Closure by Non Absorbable Sutures (Nylon)

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Abstract: What is the best type of closure or the best technique for closing wounds? The answer is straightforward: the one that meets the need of the hour. Historically man has utilized his intelligence and the materials that were known to him to close and protect wounds.

Keywords: Octyl-2-Cyanoacrylate

1. Introduction

Although sutures are considered the “gold standard” for wound closure, they sometimes produce a less favorable result than staples, tapes, and adhesives.

A tissue adhesive is defined as substance used to cause adherence of one tissue to another tissue or a biological tissue to non-tissue surfaces such as prosthesis

The first cyanoacrylates that were widely used were butyl cyanoacrylates. However because of their relatively low strength and brittle nature, their use was limited to simple short, low tension lacerations and surgical incisions.

With the development of octyl-cyanoacrylate, which is a stronger and more flexible alternative the use of TSA’s greatly expanded.

They are non invasive and do not cause pain on application, the TSA may be used without any anesthesia: and sloughs of within 5-10 days.

2. Aims and Objectives

Most of the clinical trials are conducted in western countries which cannot be directly extrapolated and applied to populations living in developing countries like India due to geographical differences.

This further highlighted the need to conduct trial to evaluate the product.

Comparison was done under following objectives
1) To compare the time required for suturing with sutures & TSA
2) Cosmesis
3) Comparisons of surgical site infections & wound dehiscence
4) Other Complications like allergic reactions
5) Cost Effectiveness

3. Methodology

Prospectively study of 100 patients was done. Patients were divided into two equal groups. All cases of elective inguinal hernia surgery were included in this study.

Factors influencing wound healing like nutritional factors (Anaemia, Vitamin deficiency, malnutrition) were taken into consideration.

Patients with diabetes, immunocompromised status, skin infections, known allergic reactions were excluded.

The glue was applied over the wound

Edges with film of glue extending 5mm on either side of the edge.

The wound was held together till it was dry to allow complete polymerization of glue as was evident by opacification of film.

Dressing was done which was removed on 3rd postoperative day and patient was allowed to take bath on 7th day.

In second group nylon sutures were used and vertical mattress sutures were taken. Wound was inspected on 3rd postoperative day and sutures were removed on 8th and 10th postoperative day.

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Stony Brook Scar Evaluation Scale was used for evaluation scar at 10th postoperative day

4. Results

- Both the group had no statistically significant difference in the age distribution and were comparable. (p value > 0.05)

<table>
<thead>
<tr>
<th>Wound closure</th>
<th>Group A</th>
<th>Group B</th>
<th>Z Value</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (sec)</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
</tbody>
</table>

![Bar diagram showing comparison of time distribution for wound closure in group A and group B](image)

<table>
<thead>
<tr>
<th>Scar evaluation</th>
<th>Group A</th>
<th>Group B</th>
<th>MW test</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
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![Bar diagram showing scar evaluation scores in group A and group B](image)
5. Discussion

- Cyanoacrylate glue adhesives were used extensively in emergency department for closure of lacerated wounds, especially pediatric wounds in western countries.
- Studies suggest that TSA take less time compared to sutures have lesser rate of infection and better cosmetic results and better acceptance by patients. These results are comparable with our study results.
- Literature shows very few studies on TSA application in clean surgical wounds.
- There are varying reports regarding antibacterial properties of cyanoacrylate glue.

6. Conclusion

Clean surgical wounds can be safely closed with use of cyanoacrylates as they take less time; provide better cosmetic results and better acceptance.

References

[6] Brig BM Nagpal, VSM, Maj Gaurav Kumar, Maj GS Nagi, Wg Cdr Pradeep Singh (Retd) MJAFI 2004; 60 : 131-133