Original Research Paper

Volume - 13 | Issue - 02 | February - 2023 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

General Surgery

SUTURE OR TISSUE ADHESIVE AFTER LAPAROSCOPIC SURGERY: A RANDOMISED CONTROL TRIAL

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ABSTRACT The search for a better and more convenient method of wound closure has led to the development of newer methods such as skin staplers1 and tissue adhesives2. Also, with the advancement of surgical techniques, most surgeries are minimally invasive in nature with smaller scars and better cosmesis. There isn't much data available regarding the use of skin glue for closure of port sites in laparoscopic surgeries. Here, we aim to compare skin closure of laparoscopic port sites using skin glue versus sutured closure in terms of cosmesis and scar quality. Patients undergoing laparoscopic surgeries (n=99) were randomly divided into group A and B where group A (n=50) underwent sutured closure of port site and Cyanoacrylate glue was used for skin closure in group B (n=49). Scar was assessed on post operative day 2, 7, 14, and 1 month for pain using Visual Analogue Pain Scale (VAS) and Stony Brook Scale was used for cosmesis and scar quality. Post operative pain at surgical site was significantly less in group B. In terms of scar quality and cosmesis as per the Stony Brook scale, group B showed significantly better results. In conclusion, skin glue is definitely a method to be considered for skin closure in those who can afford it. With time, it could become the new standard of skin closure in laparoscopic surgeries.

KEYWORDS : port closure, cyanoacrylate, glue, laparoscopy, Stony Brook scale

INTRODUCTION

The traditional method of closing any surgical wound is suturing using various suture materials. However, it is associated with surgical site occurences1, needle stick injuries2, increased time of closure, the element of foreign material in the scar tissue further the pain and inflammation at surgical site. So, the search for a better and more convenient method of wound closure led to the development of newer methods such as skin staplers and tissue adhesives[3,4].

Also, the advent of minimally invasive techniques has led to better surgical scars, reduced hospital stay and faster return to day-to-day activities. The search for the best method of closure of skin of laparoscopic port site incision is still ongoing to further improve the cosmesis.

The n-octyl cyanoacrylate is a non- reactive molecule which upon coming into contact with skin, polymerizes quickly and forms an impermeable layer. This polymeric form stays on the skin for up to 10 days after which it sloughs away due to re-epithelialization of the scar5. Furthermore, it acts as a barrier over the wound providing protection from wound infection. It's use has been documented in ophthalmic surgeries6 and for closure of small lacerated wounds7, especially among the pediatric age group but due to higher cost, sutured closure is still widely prevalent.

METHODS

In this study, 99 patients undergoing laparoscopic surgery were enrolled and randomly assigned to two groups A (n=50) for sutured port closure and group B(n=49) for adhesive port closure. In group A, port site skin closure was done using monofilament polyamide suture (Ethilon, Johnson & Johnson) with 2-0 reverse cutting needle. Port site skin closure in group B was done using n-octyl cyanoacrylate skin glue. Post operatively VAS score8 was used for pain and Stony Brook scale9 was used for scar quality and cosmesis on Day 2, 7, 14 and 1 month. Patient and observer scar assessment scale was used at 1 month to assess patient satisfaction with the scar. The collected data was comparatively analyzed using SPSS software and p values were calculated.

RESULTS

This study enrolled 99 subjects, out of which in 50 patients were included in group A and 49 in group B. The most common surgeries were laparoscopic appendectomy and laparoscopic cholecystectomy.

Mean age of the subjects was 40 years out of which 56 of the patients were females and 44 males.

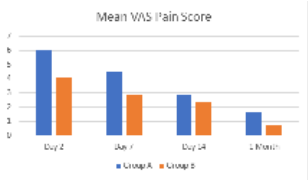
On post operative day 2, VAS score for pain was significantly higher in group A as compared to group B (p <0.0001). On post operative day 7, VAS score for pain was significantly higher in group A than in group B (p< 0.0001). On post operative day 14, VAS score for pain was significantly higher in group A than in group B (p value 0.007). At 1 month post operatively, VAS score for pain was significantly higher in Group A compared to group B (<0.0001). (Table 1) (Graph 1).

On post operative day 2, Stony Brook score was significantly less for Group A than Group B (p <0.0001). On post operative day 7, Stony Brook score was significantly less for Group A than Group B (p<0.0001). On post operative day 14, Stony Brook score was significantly less for Group A compared to Group B (p<0.0001). At 1 month post operatively, Stony Brook score was significantly less for Group A compared to Group B (p value- 0.0031) (Table 2) (Graph 2).
None of the patients developed blisters or any inflammation or post op surgical site infection. None of the patients had any kind of allergic reaction to the glue.

At the end of one month the scar was also assessed using the patient and observer scar assessment scale. OSAS showed a significant difference with a p value of 0.0333. No significant difference was noted on PSAS.

Table 1: Comparison of VAS pain score post operatively in group A and group B

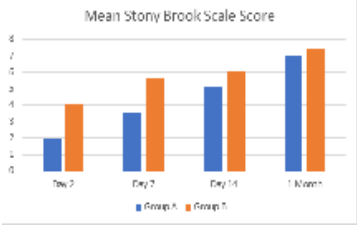
Day	Group A (mean VAS pain score)	Group B (mean VAS pain score)	P value
Day 2	5.98	4.14	<0.0001
Day 7	4.5	2.898	<0.0001
Day 14	2.88	2.388	0.0007
1 month	1.64	0.7755	<0.0001



Graph No.1 : Comparison of VAS pain score post operatively in group A and group B

Table 2: Comparison of Stony Brook score post operatively in group A and group B

Day	Group A (mean Stony Brook score)	Group B (mean Stony Brook score)	P value
Day 2	1.96	4.061	<0.0001
Day 7	3.54	5.592	<0.0001
Day 14	5.16	6.02	<0.0001
1 month	7.04	7.469	0.0031



Graph 2: Comparison of Stony Brook score post operatively in group A and group B

Discussion: -

In this study we enrolled a total of 99 patients out of which, 50 were included in group A and 49 in group B.

Group B has significantly better scar cosmesis as compared to group A. This result is similar to a study conducted by Fluellan S, et al on uro-gynecological surgeries[10]. Group B patients also had much less pain as compared to Group A. This is also comparable to data of a similar study conducted by Mastud K, et al[11]. Moreover, skin glue does not require a follow up for removal and patient satisfaction is considerably more.

The score for patient and observer assessment scale was calculated at the end of 1 month. The Observer assessment score was significantly better for Group B than Group A. This is comparable to a study conducted by Ben Safta Y, et al[12]. None of the subjects underwent any type of allergic reaction to the glue. None of the patients developed any signs of inflammation, blisters or scar dehiscence.

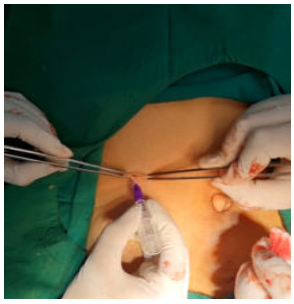


Image 1: Skin closure with n-octylcyanoacrylate

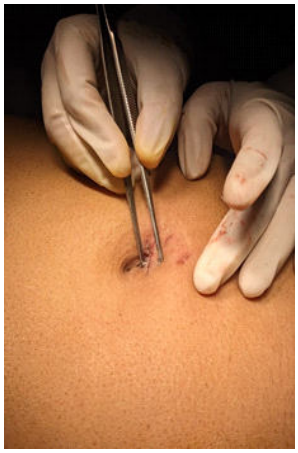


Image 2: Skin closure with n-octylcyanoacrylate

Image 3: Port sites 1 month after closure with skin glue

Image 4: Port sites 1 month after closure with sutures (Ethilon)

The strength of this study includes the fact that this trial was conducted at a single tertiary care hospital, hence allowing easier follow up and uniformity in the application as well as post operative care of both the subjects. The assessment was also conducted by a single observer thereby reducing bias. Also, the surgeon used both the techniques thereby reducing the bias for time taken.

One of the limitations of the tissue adhesive was cost. N- cyanoacrylate cost was significantly higher (approx. Rs 1450) compared to sutures (approx. Rs. 250)

Thus, the end result of this study shows that skin glue is definitely superior to the traditional method of sutured closure of the port site in laparoscopic surgeries. This data is supported by similar results seen in various other studies [13,14,15,16].

Conclusion: -

The aim of this study was to assess the benefits of skin glue over sutures in the closure of port site skin closure in elective laparoscopic surgeries.

This study has successfully proven that skin glue is better than sutures in terms of pain, cosmesis and scar quality. Although no significant difference was noted in the time taken in application of glue and sutures, this could be attributed to the time taken by the surgeon in learning a new method of closure. Patient satisfaction was better and pain was significantly less in patients with the use of glue.

Hence, skin glue is definitely a method to be considered for skin closure in those who are affording. It is an innovative and modern method of skin closure with no identifiable side effects or drawbacks. It is already in use by opthalmologists and for closing small lacerations on skin. With time, it could become the new standard of skin closure in laparoscopic surgeries as well.

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