

Comparison of the aesthetic and functional efficacy of subcuticular running closure (3/0 rapid absorbable 910 polyglactin) with N-BUTYL cyanoacrylate in episiotomy repair

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Summary

The aim of this study was to compare the aesthetic and functional efficacies of n-butyl cyanoacrylate and 3/0 rapid absorbable polyglactin 910 sutures in cutaneous repair during episiotomy. This study involved 52 cases of patients who had spontaneous vaginal delivery and episiotomy. The cases were randomized among to the type of cutaneous repair during their episiotomy. The perineal skin was repaired by taping with n-butyl cyanoacrylate (group 1) or by suturing with subcuticular 3/0 rapid absorbable polyglactin 910 suture (group 2). These two groups of patients were compared in terms of duration of repair, postpartum pain, healing and cosmetic outcomes, and dyspareunia at 48 hours and 6 weeks postpartum. The incidence of episiotomy skin dehiscence was lower in group 2 than group 1 but it was not statistically significant ($p > 0.05$). The average visual analog score of group 1 was statistically significantly lower at 48 hours postpartum (1.40 ± 0.50 vs. 3.44 ± 0.93 , $p < 0.01$) and at 6 weeks (1.12 ± 0.72 vs. 2.07 ± 0.82 , $p < 0.01$) compared with that of group 2. Also, the count of paracetamol pills used in the first 48 hours was significantly lower in the tissue glue group (1.97 ± 0.93 vs. 2.67 ± 1.21 , $p < 0.05$). Dyspareunia incidences in the first coitus following vaginal delivery showed no statistically significant differences between the two groups. Similarly, the mean Vancouver scar score showed no statistically significant differences between the two groups. The duration of operation was shorter for group 1 than for group 2 (0.81 ± 0.62 vs. 2.12 ± 0.33 , $p < 0.001$). The efficacy of using n-butyl cyanoacrylate tissue adhesives versus 3/0 rapid absorbable polyglactin 910 sutures for cutaneous episiotomy repair was similar. However, taping with tissue adhesive has the advantages of fast application and a painless postpartum period.

Key words: Cyanoacrylate; Episiotomy; Efficacy; Polyglactin; Wound healing.

Introduction

Episiotomy is a commonly used procedure for enlarging the vaginal space through an iatrogenic perineal cut. The technique and suture materials that chosen for episiotomy repair directly affects the early and late complications, especially dyspareunia, skin dehiscence, the amount of the analgesic drugs used and perineal pain [1].

Mediolateral episiotomy (MLE) repaired with continuous subcuticular suture is a commonly used technique. Compared with the conventional separate suture technique, the subcuticular suture technique is associated with less postpartum perineal pain and does require the sutures to be removed [2-6]. Recently, many studies have suggested that using rapidly absorbable (with an absorption period of about 42 days) and polyglactin (absorption period of about 62 days) sutures reduces episiotomy pain and complaints [3, 6, 7]. In addition, using skin adhesives is another method of episiotomy repair and enables safe, cheap, easy and fast application [8, 9]. They can be resolved biologically and are bacteriostatic [10, 11]. Only a limited number of studies with small sample sizes compare tissue adhesives and continuous subcuticular suture of the perineal skin.

This study compares the aesthetic and functional effi-

cacies of n-butyl cyanoacrylate and 3/0 rapid absorbable polyglactin 910 sutures in cutaneous repair of episiotomy.

Methods

The study involved 52 parturient women who had spontaneous vaginal delivery with episiotomy at one clinic over a one-year period. This prospective, randomized, case-controlled study was approved by the institutional ethics committee.

Over the duration of the study, 167 patients who had a spontaneous vaginal delivery and an episiotomy at the delivery room of our department were utilized for the study. The inclusion criteria were (a) acceptance and signing of an informed consent form; (b) being reproductive age, between 18 and 44 years old; (c) having a term pregnancy (37-42 weeks); and (d) vaginal delivery with vertex presentation and receiving an episiotomy. The exclusion criteria were (a) having systemic or endocrinological diseases like diabetes, ischemic heart disease, hyperlipidemia, collagen tissue disease, hypertension, etc. ($n = 45$); (b) multiple pregnancy ($n = 3$); (c) third- or fourth-degree perineal laceration during spontaneous vaginal delivery ($n = 8$); (d) atonia or hemorrhage during the postpartum period ($n = 1$);

Table 1. — *Visual Analog Scale [12].*

0	1	2	3	4	5	6	7	8	9	10
No pain					Very severe pain					

(e) smoking while pregnant ($n = 24$); (f) dyspareunia before pregnancy ($n = 18$); and (g) refusal to participate in the study ($n = 16$).

The patients involved in the study were randomized to receive perineal skin repair with n-butyl cyanoacrylate (group 1) or suturing with subcuticular 3/0 rapid absorbable polyglactin 910 sutures (Vicryl, 30 mm 1/2 c round-shaped needle, Ethicon, USA) (group 2). Computer-generated numbers was used for randomization. At the end of the second stage of labor, 10 cc prilocaine (citanest 2%, 20 mg bottle, Astra Zeneca, Istanbul, Turkey) was applied to the mediolateral episiotomy area of patients in both the control and intervention groups as a local anesthetic. All of the parturient women were subjected to mediolateral episiotomy. The steps of the episiotomy repair were similar in both groups until the skin repair (vaginal wall, perineal muscles and subcutaneous tissue sutured continuously, starting from the episiotomy apex, with 3/0 rapid absorbable polyglactin 910 suture). Patients in the intervention group ($n = 25$) received skin repair by taping with n-butyl cyanoacrylate (Gluseal, 510K # K030574, 0,2 mL, GluStitch Inc., Canada). The tissue adhesive was applied to the edges of the skin and abutted in this position for 1 minute. Patients in the control group had their skin repaired by suturing with subcuticular 3/0 rapid absorbable polyglactin 910 sutures (Vicryl, 30 mm 1/2 c round-shaped needle, Ethicon, USA).

The duration of skin repair was measured in both groups, and the patients were kept under observation at the hospital for 48 hours. The patients received routine postpartum medical treatment during this period, and paracetamol pills (Parol, 500 mg, Atabay Pharmaceutical Industry, Istanbul) were used as an analgesic if the patients requested, up to 4 pills per day.

Additionally, the patients were evaluated at 48 hours and 6 weeks postpartum for perineal skin pain. The degree of pain was rated with the Visual Analog Scale (VAS) (Table 1) [12]. This scale registers pain as 0 (no pain) to 10 (very severe pain) with a 10 cm ruler, and the distance that the patients marked was measured and noted in centimeters.

Both groups were also evaluated in terms of dyspareunia and scar aesthetics of the episiotomy area at 6 weeks postpartum. The Vancouver Scar Scale (VSS) was used to rate the scar aesthetics (Table 2) [13].

Statistical analysis

In this study, the Statistical Package for the Social Sciences (SPSS) version 10.0 computer program was used to analyze the statistical data, which were expressed as means and standard deviations. Student's *t*-tests (for normally distributed variables) or Mann-Whitney U-tests (for non-

Table 2. — *Vancouver Scar Scale [2].*

Evaluated Variable (Points)	
1. Vascularity	3. Pigmentation
• Normal (0)	• Normal (0)
• Pink (1)	• Hypopigmentation (1)
• Red (2)	• Mixed (2)
• Purple (3)	• Hyperpigmentation (3)
2. Flexibility	4. Thickness
• Normal (0)	• Plain (0)
• Soft (1)	• < 2 mm (1)
• Slack (2)	• 2-5 mm (2)
• Firm (3)	• > 5 mm (3)
• Extra hard (4)	
• Contracture (5)	

normally distributed variables) were used for comparison. Fisher's exact chi-square tests were used to compare qualitative data. The statistical significance level was set as $p < 0.05$.

Results

The study involved 52 parturient women who had a spontaneous vaginal delivery and episiotomy, of whom 25 were in the intervention group (group 1) and 27 were in the control group (group 2). No significant differences were found between the two groups, in terms of patient age (year, $p = 0.293$); maternal weight (kg, $p = 0.951$); body mass index (kg/m^2 , $p = 0.443$); gravidity (number, $p = 0.349$); parity (number, $p = 0.328$); number of children alive (number, $p = 0.458$); gestational week of pregnancy (week, $p = 0.305$); duration of labor (hours, $p = 0.778$); birth weight of the baby (g, 0.716); first-minute APGAR score of the baby (number, $p = 0.474$); fifth-minute APGAR score of the baby (number, $p = 0.525$); or number of prior episiotomies, if any previous vaginal delivery (% , $p = 0.917$).

In group 1, four of the patients had skin dehiscence. Two of these patients had total dehiscence, which occurred after the first 48 hours, and the other two had only 1-2 cm of dehiscence near the introitus within the first 48 hours at the hospital. In group 2, three patients had skin dehiscence, and all of them were total and occurred after the first 48 hours, at their home. None of these seven patients had episiotomy infections or unrecoverable dehiscence. In group 1, the ratio of episiotomy dehiscence was 16%, while it was 11% in group 2 ($p = 0.698$).

As seen in Figure 1, in the tissue-adhesive group, the main VAS scores were significantly lower than those of the

continuous subcutaneous group at the 48th hour (1.40 ± 0.50 vs. 3.44 ± 0.93 , $p < 0.01$, respectively) and sixth week (1.12 ± 0.72 vs. 2.07 ± 0.82 vs., $p < 0.01$, respectively) postpartum. In the tissue-adhesive group, fewer paracetamol pills were used in first 48 than in the other group (1.97 ± 0.93 vs. 2.67 ± 1.21 , $p = 0.023$, respectively). However, the two groups had no statistically significant difference in dyspareunia rate (24% [six parturient women] in group 1 vs. 25.9% [seven parturient women] in group 2, $p = 0.563$).

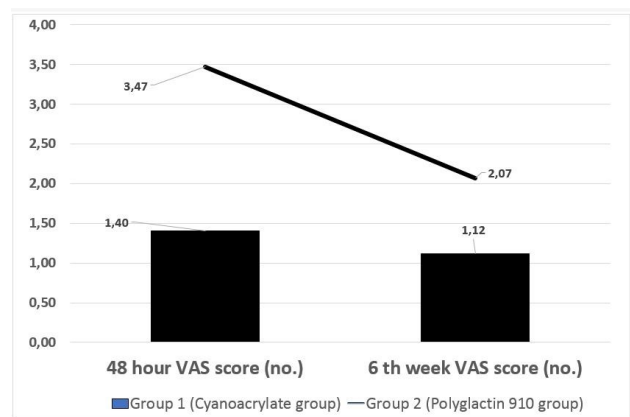


Figure 1. — Comparison of pain rated according to the Visual Analog Scale between group 1 (cyanoacrylate) and group 2 (polyglactin 910).

The mean period of taping with tissue adhesive was 0.81 ± 0.62 min, versus 2.12 ± 0.33 min. in the subcuticular suturing group, and the p value was statistically significant ($p < 0.001$).

The VSS score in the tissue-adhesive group was 1.44 ± 0.65 , versus 1.59 ± 0.69 in the continuous subcuticular suturing group ($p = 0.418$, Student's t -test).

Discussion

Our study investigated the effectiveness of skin adhesives in episiotomy repair. Based on our preliminary report, the skin-adhesive group had better results for short- and long-term pain, and their VAS scores were significantly lower in the first 48 hours and the sixth week postpartum. Additionally, the skin-adhesive group used significantly fewer paracetamol pills in the first 48 hours and had a significantly quicker procedure. Dyspareunia and sixth-week VSS scores were better in the adhesive group, although this result was not statistically significant.

Only a few studies [14] have been conducted on using tissue adhesives for episiotomy repair. All published studies had the main limitations of low sample size or reported a study group without control. In one study, the effect of episiotomy repair with chromic catgut or skin-adhesive material was investigated. It was shown that using *n*-butyl-2-cyanoacrylate for episiotomy had better results [15]. The current study results also report the advantages

of cyanoacrylate for episiotomy repair, as compared to the subcuticular technique with regard to pain score. Using another tissue adhesive molecule octyl blend cyanoacrylate also made the episiotomy repair painless, effective and safe [16]. Pain may be associated with micturition, walking, and defecation. Compared with subcuticular closure, enbucrilate had the advantage of less perineal pain during these functions [8]. The low number of paracetamol tablets used by the tissue-adhesive group in the present study also supported the previous study's results regarding the painlessness of tissue adhesives.

The pain related to episiotomy repair also important in long term period. Following one and half months of episiotomy repair, the women may face with the problem of dyspareunia. Enbucrilate give the women the chance of more sooner pain free intercourse [8, 9]. The similar molecule (*n*-butyl cyanoacrylate) used in our study also supported this finding.

Skin adhesives (octyl-2-cyanoacrylate) had also the advantage of short operation time with similar complication rates compared with polyglactine 910 [9]. The easy application technique and fast re-approximation time of wound lib with tissue adhesive may make the operation time shorter as in our study.

The reported complications of episiotomy closure were skin dehiscence, adhesive / suture detachment, perineal edema, severe pain, longer hospital stay, granuloma formation, local infection and dyspareunia. Many studies reported the similar complication rates of tissue adhesive [14] compared with suture methods. In our study, tissue adhesive group had 11%, while subcuticular group had 16% of complication rate. Comparable dyspareunia rates in both groups was also observed. The current review showed that not suturing the skin caused less short-term and long-term pain compared with suturing the skin as well as an increased rate of skin separation. Skin adhesives caused less short-term pain without a statistically significant increase of skin separation, as compared with the suturing group [14].

Closure of episiotomy with tissue adhesive or suture material causes acute inflammatory reaction, pain, itch and discomfort. These reactions may result in perineal pain and cosmetic problems [15]. The comparison of two techniques focusing on cosmetic results has not been well investigated. The current study also reported the comparable scores of Vancouver Scar Scale in tissue adhesive and subcuticular skin closure.

Clinical experience indicates that iatrogenic cuts that are not clean, have bad wound approximation, have a wet surface and are under high wound tension are repaired with sutures rather than with tissue adhesives. Wounds on mucosal surfaces (e.g., the vagina), on areas with high moisture (such as the perineum) and in hairy areas are also treated with limited use of tissue adhesives [17-20]. Episiotomy repair has some of these properties. These factors result in the limited use of tissue adhesives in episiotomy repair. Based on this main issue, studies investigating the effects of

cyanoacrylate on episiotomy repair may have clinical value, and the results of such studies may enlarge the knowledge on this subject. Our study reports the successful use of cyanoacrylate for episiotomy repair with cosmetically and aesthetically good outcomes.

The main limitations of this study are the small sample size and its use of patients from a single center. Future studies including more patients with multicenter participation may support our study results.

Conclusions

The efficacy of n-butyl cyanoacrylate was similar to that of 3/0 rapid absorbable polyglactin 910 sutures for cutaneous episiotomy repair and that the taping method had advantages, like being fast, safe and painless. However, more studies are needed for efficient use of skin adhesives for repairing episiotomies.

Ethics Approval and Consent to Participate

All of the procedures performed in this study, which involved human participants, were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards (Issue date December 27, 2007, registration number 2007/69). Informed consent was obtained from all participants included in the study.

Author Contributions

EEA and SG designed the research study. EEA performed the research. SG analyzed the data. SG, ESGG and GNCS wrote the manuscript. All of the authors contributed to editorial changes in the manuscript. All of the authors have read and approved the final manuscript.

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Conflict of Interest

The authors report that they have no proprietary or commercial interest in any product mentioned or concept discussed in this article.

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