Comparison of Different Suture Techniques

Farklı Sütür Tekniklerinin Karşılaştırılması

Sütür / Suture

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Özet

Amaç: Travmalar acil servise sık başvuru nedenlerindendir. Sütür, skalp kesisi olan hastaların tedavisinde sıklıkla gereklidir. Bu çalışmada skalp kesisi olan hastalarda farklı sütür tekniklerinin yara iyileşmesi, hasta memnuniyeti ve maliyet üzerine etkisinin araştırılması amaçlanmıştır. Gereç ve Yöntem: Çalışmaya toplam 60 hasta alındı. Hastalar geleneksel sütür (Grup 1), stapler (Grup 2) ve doku yapıştırıcı grubu (Grup 3) olarak üç gruba ayrıldı. Grupların karşılaştırılmasında x^2 ve Kruskal-Wallis testleri kullanıldı. $p<0.05$ değeri istatistiksel olarak anlamlı kabul edildi. Bulgular: Hastaların 2/3'ü erkekti. En fazla hasta memnuniyeti 3. gruptaydı ($p<0.05$). Maliyet açısından en ucuzu doku yapıştırıcılardı ($p<0.05$). Tartışma: Yaygın geleneksel inanışın tersine doku yapıştırıcı ve stapler gibi alternatif sütür teknikleri pahalı değildir. En fazla hasta memnuniyeti doku yapıştırıcı kullanılan gruptaydı.

Anahtar Kelimeler

Acil; Stapler; Doku Yapıştırıcı

Abstract

Aim: Traumas are frequent causes of presentation to emergency departments. Suturing is usually required in treatment of patients with scalp laceration. This study aimed to investigate different suture methods with respect of patient satisfaction, wound healing, and treatment cost in patients with scalp laceration. Material and Method: A total of 60 patients were included in the study. The patients were divided into 3 groups; traditional suturing (Group 1), stapling (Group 2), and the tissue adhesive (Group 3) groups. Chi-Square and Kruskal-Wallis tests were used for comparison of the groups. A p value less than 0.05 was considered statistically significant. Results: Two-thirds of the patients were male. The patient satisfaction was highest in the Group 3 ($p<0.05$). Tissue adhesive group had the lowest treatment cost ($p<0.05$).Discussion: In contrast to existing traditional belief, the alternative suture methods, i.e. tissue adhesives and staples are not expensive. The patient satisfaction was highest in the tissue adhesive group.

Keywords

Emergency; Staples; Tissue Adhesives

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Introduction

Traumas have a significant proportion in the emergency department visits. The repair of skin wounds is a significant part of emergency practice [1]. Lacerations constitute more than a fourth of all minor injuries and 4.4% to 11% of all visits to emergency departments [2]. Suturing is usually required in treatment of patients with scalp laceration. Various suture techniques including standard suturing (suturing with string and needle), stapling, and tissue adhesives were used depending on the physician preference and available resources.

Previous studies have examined the effectiveness of suturing different strings in different parts of the body as well as the effectiveness of skin staples or tissues adhesiveness [3-9]. However no studies have compared various methods with respect of cost and patient satisfaction. This study aimed to compare different wound treatment methods with respect of patient satisfaction, wound complications, and treatment cost in patients with scalp laceration.

Material and Method

This study was performed prospectively at the emergency department of Trakya University between March and April 2009 after approval of the study by the local ethical committee. A total of 60 consecutive patients who presented with scalp laceration and fulfilled the inclusion criteria (Table 1) were enrolled. Lacerations were sutured with needle and string (traditional suturing) in Group 1 (n=20), treated with a stapler in Group 2 (n=20) or a tissue adhesive in Group 3 (n=20).

Table 1. Inclusion/Exclusion criteria to study

Inclusion criteria	Exclusion criteria
1. Being older than 18 years of age	1. Being younger than 18 years of age
2. Having a scalp laceration	2. Not accepting to participate in the study
3. Accepting to participate in the study	

The cost of the used method and the demographic features of the patients such as age, sex, and the length of the laceration were recorded in the form. At 10th day after the procedure the patients were called to return for being examined against wound complications. In control visits they were asked about their level of satisfaction and whether they would prefer the same method they were treated with if they had to be treated again for a wound. The suture silk was used in the patients in Group 1. The patient satisfaction was evaluated by using the Visual Analog Scale. List prices of the materials and procedures in the Health Delivery Notification announced by Turkish Social Security Institution in 2009 were taken as a reference for the calculation of the cost. The data of the Central Bank of Republic of Turkey dated 5.5.2009 were used in the conversion of the currency. The data were analyzed with SPSS 15.00 for Windows software package. Normal distribution of the stusy data was tested with Kolmogorov-Smirnow test. The x^2 and Kruskal-Wallis tests were used in the statistical analysis. A $p<0.05$ value was considered statistically significant. Power of the study was calculated as 0.73.

Results

A total of 60 patients were enrolled in the study. Two-thirds of the patients were male. The mean age was 37.3±11.3 years in Group 1, 39.6±13.6 years in Group 2, and 36.05±14.4 years in Group 3 ($p>0.05$). Mean cut length was 2.45±0.5 cm in Group 1, 2.52±0.5 cm in Group 2, and 2.42±0.4cm in Group 3 ($p>0.05$). The demographical and the clinical features of the patients were summarized in Table-2.

The cost of the treatment was lowest in Group 3 (Table 2). There was a significant difference between the groups with respect of cost ($p<0.05$).

The patient satisfaction was highest in the Group 3 (Table 2). There was a significant difference between the groups with respect of patient satisfaction ($p<0.05$)

Wound dehiscence and development of wound infection were considered as complications. Wound dehiscence was observed in 2 patients in Group 1 and in 2 patients in Group 3. Wound infection developed in 4 patients in Group 1 and in 2 patients in Group 2. There was no significant difference between the groups in terms of complication rate ($p>0.05$).

Table 2. Demographical and the clinical features of the patients

	Group 1 (n)	Group 2 (n)	Group 3 (n)	p value
Sex M/F	15/5	13/7	12/8	$x^2=1.5$, $p>0.05$
Mean age (years)	37.3±11.3	39.6±13.6	36.05±14.4	$x^2=61$, $p>0.05$
Mean cut length (cm)	2.45±0.5	2.52±0.5	2.42±0.4	$x^2=4.81$, $p>0.05$
Patient satisfaction	6.8±1.2	7.95±1.4	8.85±0.9	$x^2=25.23$, $p<0.005$
Complication	4	2	2	$x^2=1.15$, $p>0.05$
Wound dehiscence	2	0	2	$x^2=2.14$, $p>0.05$
infection	4	2	0	$x^2=4.44$, $p>0.05$
Mean suture time	16.45±2	2.40±0.5	2.30±0.4	$x^2=60.65$,$p<0.001$
Cost ($)	70.5	70.5	48	$x^2=120$, $p<0.001$
Choice (%)	40	80	85	$x^2=11.25$,$p<0.005$

Discussion

The simple wound closure of the lacerations with string and needle has been traditionally used for decades. However, alternative suture methods were developed in parallel with the advancing technology.

Farion et al [9] suggested using tissue adhesives as they shorten procedure time and reduce the pain. Previous studies have shown that stapling is 5-7 times quicker than suturing [1]; [10]; [11]. Souza et al. demonstrated that tissue adhesives were 3 times quicker than suture [12]. In contrast, Coulthard et al reported that suture was quicker than tissue adhesive [12]. Comparison of the time to treatment in different modalities demonstrated that Group 2 and 3 were significantly quicker compared to Group 1, a condition which was due to absence of need for local anesthesia and ease of application with staplers or tissue adhesives.

Comparison of the suture methods with respect of the patient satisfaction revealed that Group 3 had the highest patient satisfaction. Ability to take shower on the next day provided a great advantage for the patients. Patients in Group 1 gave a negative

answer when they were asked if they would again prefer the same method they were treated with while most patients in Group 2 and 3 stated that they would prefer the same method. The prolonged procedure time and the unpleasant sensation of the entry and exit of the suture needle may have played a role in this preference.

Farion et al [8] and Karaduman et al [14] reported that there was no difference between the traditional suture method and the tissue adhesive in terms of complication rates. However, Kanegaye et al [1] reported a lower complication rate in stapling than suturing.

Souza et al reported that complications of tissue adhesives for wound closure included infection 2.1% and dehiscence 22.1% [12]. Coulthard et al. reported that sutures were better than tissue adhesives with respect of dehiscence [13]. Biancari et al showed that staples and sutures were similar in terms of wound dehiscence [15]. Smith et al reported an increased infection rate with wound closure with staples compared to that with suture [16]. Our complication rates were similar in the 3 groups. The complications such as infection and suture dehiscence may develop at low rates in all three methods.

Alternative methods like the staples, and tissue adhesives cannot be used since they are considered to be expensive and ther is a lack of experience with their use. Kanegaye et al [1] reported that stapling was less expensive than suturing in the repair of uncomplicated pediatric scalp lacerations. Osmond et al [7] reported that the cost of tissue adhesives was high. Farion et al [8] reported that the cost of the tissue adhesives was equal to the cost of traditional suturing. Coulthard et al reported that suture and tissue adhesive were similar with respect of treatment cost [13]. We observed that the costs of tissue adhesive and the staples were not as high as previously predicted; the costs of the traditional suturing and stapling were equal, and the tissue adhesives were cheaper than the traditional method. When the tissue adhesives are used, the local anesthesia and the dressing are not required, reducing the cost. In addition, we also think that a widespread use of tissue adhesives and the competition among the manufacturing companies would reduce their cost.

Souza et al reported a patient satisfaction of 97.3% for tissue adhesives [12]. Coulthard et al reported a higher patient satisfaction for sutures than tissue adhesives [13]. We found the highest patient satisfaction in the tissue adhesive group.

Conclusion

Contrary to the traditional belief, the alternative suture methods like tissue adhesives and staples are not expensive, and therefore they can be preferred. We think that the use of these alternative methods should be generalized since they are quicker and associated with greater patient satisfaction.

Competing interests

The authors declare that they have no competing interests.

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