Physical Education, Health and Social Sciences

https://journal-of-social-education.org E-ISSN: 2958-5996

P-ISSN: 2958-5988

Prevalence and Evaluation of Cosmetically Absorbable and Non Absorbable Sutures in the Management of Traumatic Surgical Wounds

Yasir Ali[1], Dr. Hasnain Javed[2], Dr. Nimra Aziz[3], Alia Naseer[4], Chandni Rubina[5], Muhammad Arslan[6]

[1] Student, Allied Health Sciences, Superior University, Lahore. yasirali15951@gmail.com
[2] Associate Professor, Faculty of Allied Health Sciences, Superior University, Lahore
[3] Assistant Professor, Faculty of Allied Health Sciences, University of Lahore
[4] Senior Lecturer, Surgical Technology, University of Lahore
[5] Lecturer, Surgical Technology, University of Lahore
[6] Surgical Technologist, Nusrat Hospital Lahore.
Correspondence Author: **Yasir Ali**

DOI: https://doi.org/10.63163/jpehss.v3i1.175

Abstract

Background: The frequency and efficacy of absorbable and non-absorbable sutures in the treatment of traumatic surgical wounds are investigated in this study. In order to maximize suture selection for better clinical outcomes and fewer issues, it assesses their effects on healing, cosmetic results, and patient satisfaction. **Objective**: To determine the prevalence of cosmetically absorbable and non-absorbable sutures in the management of traumatic surgical wounds. **Methodology:** This was a randomized control trial carried out at Services Hospital duration of six months and using a calculated sample size of 80 based upon two means of suture infection. Patients aged 20–50 with traumatic surgical wounds in aesthetically sensitive areas such as the face, neck, or hands, in which the cosmetic outcomes were prominent. **Results:** The study analyzed 80 participants, with 53.8% aged 20–30, 43.8% aged 31–40, and 2.5% aged 41–50. Males comprised 57.5%, females 40.0%, and 2.6% were unspecified. Lacerations were the most common wound type (56.3%), followed by puncture wounds (32.5%) and abrasions (11.3%). Upper extremities were the most affected (46.3%), followed by the head and face (41.3%) and lower extremities (12.5%). Both absorbable and non-absorbable sutures were used equally. No significant correlation was found between suture type and scar appearance (p=0.243) or healing time (p=0.686). However, non-absorbable sutures were associated with significantly higher satisfaction levels (p=0.002). **Conclusion:** The study found that both absorbable and non-absorbable sutures were equally used in managing traumatic surgical wounds. No significant correlation was observed between suture type and scar appearance (p=0.243) or healing time (p=0.686). However, patient satisfaction significantly favored non-absorbable sutures (p=0.002), with recipients reporting higher levels of happiness compared to those with absorbable sutures.

Key words: Traumatic Surgical Wounds, Scars, Absorbable and Non Absorbable.

Introduction

Skin closure is vital for most surgeons. Thousands of procedures are performed annually, and nearly all of them involve skin closure. Staples, surgical sutures, and glues are frequently used to seal skin wounds. Staples carry a significantly higher risk of wound infection than suture closure. Hence, Absorbable Sutures

Group (AG) challenged the non absorbable suture for the position of ideal skin closure suture. The standards of effective wound closure include quick skin healing, a pleasing cosmetic appearance, and a low risk of consequences. Numerous earlier studies on the closure of wounds using absorbable or nonabsorbable sutures produced contradictory findings [(1)]. The goal of enhancing the outcome measures associated to skin closure after different surgical operations has been the subject of several studies, which has led to a significant and rapid evolution of skin closure techniques, especially in the recent few decades. Numerous techniques for skin closure have been documented in medical literature. These include absorbable or non-absorbable suture (NAS) closure, simple suture vs mattress sutures, full thickness closure, subcuticular closure, glue assisted closure, staples closure, and other cutting-edge techniques. Wound dehiscence is a complex issue that is influenced by pre-, intra-and postoperative variables in addition to local and systemic ones [(2)]. The development of human society is directly linked to the history of surgery, especially wound closure. The earliest surgical needles were made of bone and date back to at least 20,000 BC, while the earliest sutures were made of plants, linen and substance. Closing wounds using linen strips coated with a honey-flour combination was a common practice among the ancient Egyptians. Surgical sutures are used to keep tissues together, aiding in wound closure and promoting healing after trauma or surgery. In the past, absorbable sutures were only intended to be used to join internal organs. Nevertheless, using absorbable sutures for percutaneous wound closure has grown in popularity recently. The most common nosocomial infection, also called surgical site infections (SSIs), cause poor or delayed recovery in surgical patients. Given the significant risk involved in any surgical procedure and the function of suture materials in the healing of wounds following surgery, studying SSIs linked to various suture types is crucial [(3)]. Absorbable sutures (AS) or nonabsorbable sutures (NAS) can be used for the epidermal closure. Suture selection in this case is supported by low-quality verification, which may be impacted by a number of variables, such as patient/clinician preference, cost, cosmesis, anatomical placement, availability for suture removal, and risk of complications. To determine whether this change is sustained, more research is necessary. Response bias may be a drawback to this study's (and other self-reported surveys') generalizability. There is a noteworthy person, interspeciality and regional differences in the opinions of clinicians regarding the best suture type (NAS vs. AS) for epidermal closure and how suture type affects clinical and patient-reported outcomes [(4).] Excision of skin lesions is one of the most common surgical procedures, and as the incidence of skin cancer rises worldwide, the clinical and financial burdens on health care systems will probably rise as well. After excisional skin surgery, absorbable (AS) or non-absorbable (NAS) sutures can be used to close the superficial skin [(5).] Cosmetic suture technology has the greatest direct impact on the suturing procedure in facial trauma surgery, which is the initial therapy strategy for face damage. Following the "ordinary suture technique" with a single layer 1.0 silk closure, the suture must be taken out and the resulting scar is now clearly visible. The results of scar removal are still not perfect even after antiscar medications and laser treatment are used. Therefore, we all opt to adopt "cosmetic suture technology" with a good scar prognosis for children with high prognostic requirements for open face injuries [(6).]

Methodology:

This was a randomized control trial carried out at Services Hospital duration of six months and using a calculated sample size of 80 based upon two means of suture infection. Patients aged 20–50 with traumatic surgical wounds in aesthetically sensitive areas such as the face, neck, or hands, in which the cosmetic outcomes were prominent. The participants were sewn with absorbable sutures or non-absorbable sutures for the closure of the wounds. ≤10 months26 or 11 months21 and excludes patients who did not provide informed consent and agree to attend follow-up evaluations.

Results:

The study analyzed 80 participants, with 53.8% aged 20–30, 43.8% aged 31–40, and 2.5% aged 41–50. Males comprised 57.5%, females 40.0%, and 2.6% did not specify their gender. Lacerations were the most common wound type (56.3%), followed by puncture wounds (32.5%) and abrasions (11.3%). Upper extremities were the most affected areas (46.3%), followed by the head and face (41.3%) and lower extremities (12.5%). Both absorbable and non-absorbable sutures were used equally. Regarding scar appearance, 43.8% rated it as good, 23.8% as excellent, 23.8% as fair, and 8.8% as poor. Healing time was 2–4 weeks for 73.8% of participants, 1–2 weeks for 18.8%, and more than four weeks for 7.5%. No significant correlation was found between suture type and scar appearance ($p=0.243$) or healing time ($p=0.686$). However, a statistically significant relationship existed between suture type and patient satisfaction ($p=0.002$). Participants with non-absorbable sutures expressed greater satisfaction, with 24 reporting happiness and 11 feeling neutral. In contrast, those with absorbable sutures showed lower satisfaction levels, with 14 reporting dissatisfaction. Despite the absence of significant differences in healing time and scar appearance, the findings indicate that non-absorbable sutures were associated with higher patient satisfaction, suggesting a preference for these sutures in cosmetic surgical wound management.

Table 1: Variables

Variables	Ranges	Frequencies	Percentages
Age	20-30 years	43	53.8
	31-40 years	35	43.8
	41-50 years	2	2.5
Gender	Male	46	57.5
	Female	34	42.5
Chronic Medical Conditions	Yes	31	38.8
	No	49	61.3
Smoking Status	Current Smoker	38	47.5
	Former Smoker	8	10.0
	Never Smoke	34	42.5

Table 2: Wound Details

Wound Details	Ranges	Frequencies	Percentages
Type of Wound	Laceration	45	56.3
	Puncture	26	32.5
	Abrasion	9	11.3
Location of Wound	Head, Face	33	41.3
	Upper extremities	37	46.3
	Lower extremities	10	12.5
Depth of Wound	Superficial	37	46.3
	Moderate	33	41.3
	Deep	10	12.5
Type of Sutures Used	Absorbable	40	50.0
	Non Absorbable	40	50.0
Time from Injury to Treatment	Less than 1 hr	8	10.0
	1 to 3 hrs	39	48.8
	3 to 6 hrs	30	37.5
	6 to 12 hrs	3	3.8
Anesthesia Used	Local anesthesia	69	86.3

	General anesthesia	11	13.8

Table 3: Patient Outcomes

Patient Outcomes	Ranges	Frequencies	Percentages	P-Value
Pain Level During Suture Placement	No pain	28	35.0	
	Mild pain	48	60.0	
	Severe pain	4	5.0	
Appearance of Scar	Excellent	19	23.8	.243
	Good	35	43.8	
	Fair	19	23.8	
	Poor	7	8.8	
Time for Complete Healing	1-2 week	15	18.8	.686
	2-4 weeks	59	73.8	
	More than 4 weeks	6	7.5	
Overall Satisfaction	Satisfied	35	43.8	.002
	Neutral	28	35.0	
	Dissatisfied	17	21.3	

Discussion:

Jianfei Zhang et al completed this study in 2022. They find that children with facial emergency trauma had their wounds treated with absorbable collagen thread and cosmetic sutures, the results showed good wound healing, minimal scar extension, minimal erythema and pigment abnormalities, no visible surgical trace, and no scar hypertrophy or atrophy. Overall, the experience was positive, family members were quite satisfied, and children's patients did not experience the agony of having their stitches removed. Clinical use of absorbable sutures in cosmetic suture methods is warranted[7]. But in recent study out of 80 individuals were served, 53.8% (43) participants were in 20-30 age range, 43.8% (350 participants were in 31-40 age range while 2.5% (2) participants were in 41-50 age range. participants were served, 57.5% (46) participants were male, 40.0% (32) were female while 2.6% (2) participants were not gender specified. D Desai et al did this study in 2023. In 27 RCTs, they found that, among 5096 patients, there was no significant difference between absorbable and non-absorbable sutures in terms of the incidence of wound infections, scar formation, and wound dehiscence; the results of both groups were fairly comparable with no heterogeneity; absorbable sutures for skin closure were not less effective than nonabsorbable sutures; they should be recommended because of their high cost and time savings; well-designed RCTs with adequate follow-ups are required to fully clarify whether better cosmetic results can be obtained using intradermal absorbable sutures[8]. But in respect of our recent research out of 80 participant's absorbable sutures were used in 50.0% of individuals and non-absorbable sutures were used in 50.0% of individuals. Kashish Malhotra et al completed this study in 2024. Nine RCTs comprising 804 participants who had facial injuries were included in the study. 50.2% (403 injuries) of these injuries required absorbable sutures, whereas 49.8% (401 injuries) required nonabsorbable sutures. It was concluded that there was little chance of bias in the quality of the included research[9]. While in our study out of 80 participants most common location of wound was upper extremities 46.3% (37 Participants), followed by head and face 41.3% (33 participants) and with lower extremities 12.5% (10 participants). Daniel Nemirov et al did this study in 2025. There were no significant differences between the AS and NAS groups in terms of age, gender, or diabetes; postoperatively, there was no significant difference in the rates of dehiscence, infections, or antibiotic prescription; and the rates of 30-day complications (1.36

% vs 1.47 %; p = 1.000), 60-day complications (0.68 % vs 2.19 %; p = 0.113), and reoperation (1.13 % versus 1.46 %; p = 0.903) and a total of 867 patients in this study[10]. While in recent research 38.8% of Participants (31 Individuals) reported having chronic medical condition, 61.3% of Participants (49 Individuals) did not have any chronic medical condition out of 80 respondents. majority of participants 56.3% (45 individuals) had a laceration, followed by 32.5% participants (26 individuals) with a puncture wound while 11.3% participants (9 individuals) had abrasion on wound. Abhay N et al completed this study in 2024. The study shows that out of total patients were recruited and split equally into two groups. Age, race, sex, number of sutures, wound length, and multilayer repair rates did not differ across the groups. The patient's average age was three months. The rates of infection, wound dehiscence, and hypertrophic scar formation—all of which were 6% in this study—did not differ significantly. Both Group 1's and Group 2's mean VAS scores of 90.3 and 91.7 did not show any discernible differences in cosmetic results[11]. but in recent study that out of 80 individuals most participants received treatment within 1-3 hours 48.85% (39 individuals), 37.5% (30 individuals) were treated within 3-6 hours. A smaller portion of 10.0% (8 individuals) received treatment with less than 1 hour while 3.8% (3 individuals) treated within 6-12 hours. This study was done by Prema D et al in 2022. They came to the conclusion that absorbable sutures are a significant medical innovation for wound care, and that new advancements have improved their effectiveness and suitability. The development of suture material classes based on their characteristics and potential to aid in wound healing and tissue approximation has been steadily increasing. Over the past few decades, numerous types of absorbable sutures have been developed thanks to technological advancements in material science. These include the latest knotless suture variation, various rates of tensile strength retention, absorption rates, and antibacterial coating[12]. While in recent study it was found that It examined how the scar's appearance and the kind of suture utilised related to each other. Participants gave their scars a rating of 7 for excellent, 16 for good, 12 for fair, and 5 for poor for absorbable sutures. 12 participants gave their scar a rating of excellent, 19 gave it a good rating, 7 gave it a fair rating, and 2 gave it a poor rating for non-absorbable sutures. With a p-value of 0.243, there is no statistically significant correlation between the scar's appearance and the type of suture. Another study was made by Peiru Min et al in 2023. The average subcutaneous tension-relieving suture duration was found to be 5 minutes, with 76 trunks, 32 extremities, and 12 cervical PS included in the total. At 3, 6, and 12 months after surgery, the Patient and Observer Scar Assessment Scale (POSAS) score dropped from 84.70 ± 7.06 preoperatively to 28.83 ± 3.09, 26.14 ± 1.92, and 24.71 ± 2.00, respectively ($p < 0.0001$). The perfusion dropped dramatically from 213.64 ± 14.97 to 112.23 ± 8.18 at 6 months ($p < 0.0001$), and the scar widths were 0.17 ± 0.08, 0.25 ± 0.09, and 0.33 ± 0.10 cm, respectively. In the majority of instances, the wound edge flattened throughout the first three months, with only two scar relapses[13]. But in our study out of 80 participants most common location of wound was upper extremities 46.3% (37 Participants), followed by head and face 41.3% (33 participants) and with lower extremities 12.5% (10 participants). most participants received treatment within 1-3 hours 48.85% (39 individuals), 37.5% (30 individuals) were treated within 3-6 hours. A smaller portion of 10.0% (8 individuals) received treatment with less than 1 hour while 3.8% (3 individuals) treated within 6-12 hours. Cochetti et al completed this study in 2020. They discover that 42 RCTs with a total of 11,067 patients and extremely low to low quality were included. Overall wound infections from sutures were marginally lower (4.90%) than those from staples (6.75%), although it's unclear if there was a difference between the two groups (risk ratio [RR] 1.20, 95% CI 0.80–1.79; patients = 9864; studies = 34; I2 = 70%). Additionally, there was not enough evidence to establish a difference in the grade of satisfaction (RR 0.99, 95% CI 0.91–1.07; patients = 3243; studies = 14; I2 = 67%) or severe wound infection (staples 1.4% vs. sutures 1.3%; RR 1.08, 95% CI 0.61–1.89; patients = 3036; studies = 17; I2 = 0%). and hospitalization[14]. But in our study out of 80 participants, 73.8% (59 participants) the time of healing was 2-4 weeks, 18.8% (15 participants) time of healing was 1-2 weeks while time of healing was more than 4 weeks in 7.5% (6 participants) and 43.8% expressed overall happiness, 35.0% expressed neutrality, and 21.3% expressed dissatisfaction.

Conclusion:

The study found that both absorbable and non-absorbable sutures were equally used in managing traumatic surgical wounds. No significant correlation was observed between suture type and scar appearance (p=0.243) or healing time (p=0.686). However, patient satisfaction significantly favored non-absorbable sutures (p=0.002), with recipients reporting higher levels of happiness compared to those with absorbable sutures. Lacerations were the most common wound type, and upper extremities were the most affected areas. The findings suggest that while both suture types are effective for wound closure, non-absorbable sutures may contribute to greater patient satisfaction, potentially influencing future suture selection in cosmetic wound management.

References:

Desai D. Stitch with Which Absorbable vs Nonabsorbable Suture for Skin Closure–A meta-analysis. medRxiv. 2023;03(19).2020-30.

Prasad B. Absorbable versus non-absorbable sutures in closure of laparotomy incisions. Journal of Advanced Medical and Dental Sciences Research. 2020;41(3):421-38.

Alkandari AF, Soliman DM, Madhyastha S, Alawadhi AA, Alawadhi FA, Almotairi NM, et al. Using absorbable sutures for traumatic wound closure to avoid additional hospital visits for suture removal during the COVID-19 pandemic: a randomized controlled trial. Cureus. 2022;14(10);2018-19.

Ejaz ru, nasir b, akbar a. Comparison of incidence of postoperative sternotomy surgical site infections and impact of suture type (absorbable or non-absorbable) on its frequency. Journal of population therapeutics and clinical pharmacology. 2023;30(18):2029-37.

Lee A, Stanley G, Batchelor JM, Abbott RA, Gardiner MD, Wernham AG, et al. An international clinician survey CompAring Nonabsorbable Vs. Absorbable sutures for Skin surgery: the CANVAS study. British Journal of Dermatology. 2022;187(3):445-7.

Lee A, Stanley GH, Wade RG, Berwick D, Vinicombe V, Salence BK, et al. International, prospective cohort study comparing non-absorbable versus absorbable sutures for skin surgery: CANVAS service evaluation. British Journal of Surgery. 2023;110(4):462-70.

Koppa M, House R, Tobin V, Rozen WM, Hunter-Smith DJ, Goldie SJ. Suture material choice can increase risk of hypersensitivity in hand trauma patients. European Journal of Plastic Surgery. 2023;46(2):239-43.

Malhotra K, Bondje S, Sklavounos A, Mortada HH, Khajuria A. Absorbable Versus Non-Absorbable Sutures for Facial Skin Closure: A Systematic Review and Meta-Analysis of Clinical and Aesthetic Outcomes. Archives of Plastic Surgery. 2019;32:699-707.

Hanna AJ, Sonnier JH, Coladonato C, Destine H, Wilson S, Ciccotti MG, et al. Greater Patient Satisfaction With Use of Nonabsorbable Sutures Compared to Absorbable Sutures for Skin Closure Following Knee Arthroscopy: A Randomized Controlled Trial. Arthroscopy, Sports Medicine, and Rehabilitation. 2023;5(6):2014-25

Sayeed b, hashmi ks, qamar sa. Wound complications;: comparison of non-absorbable suture (prolene) with absorbable suture (vicryl) in terms of wound complications and cosmesis. The professional medical journal. 2019;26(05):753-8.

Zhang J, Han P, Yuan H, Tang Y, Xiao X. Clinical application of absorbable collagen thread and cosmetic suture technique in emergency treatment of children's facial trauma. Journal of Paediatrics and Child Health. 2022;58(11):2039-43.

Teoh L-Y, Chong S-S, Hoh S-Y, Teoh M-S, Ng K-L. A comparison of aesthetic outcome between tissue adhesive and subcuticular suture in thyroidectomy wound closure in a multiracial country: a randomized controlled trial. Asian journal of surgery. 2019;42(5):634-40.

Erol O, Buyuklu F, Koycu A, Jafarov S, Gultekin G, Erbek SS. Comparison of rapid absorbable sutures with nonabsorbable sutures in closing transcolumellar incision in septorhinoplasty: short-term outcomes. Aesthetic Plastic Surgery. 2020;44:1759-65.

Tagliaferri V, Ruggieri S, Taccaliti C, Gentile C, Didonna T, D'asta M, et al. Comparison of absorbable and permanent sutures for laparoscopic sacrocervicopexy: a randomized controlled trial. Acta Obstetricia et Gynecologica Scandinavica. 2021;100(2):347-52.

Son TN, Bao HV. Long-term absorbable versus non-absorbable suture in laparoscopic percutaneous extraperitoneal closure of internal ring for inguinal hernia in children. Journal of Pediatric Surgery. 2021;56(7):1127-31.