Content available at: https://www.ipinnovative.com/open-access-journals

The Journal of Dental Panacea

Journal homepage: https://www.jdentalpanacea.org/

Original Research Article

Aesthetic outcome and complications of simple interrupted versus running subcuticular sutures in retromandibular and submandibular region

Mohd. Javed[1]*, Shaji Thomas[1], Akash Pillai[1], Chitranjan Tomar[1], Prakhar Dhanare[1]

[1]Dept. of Oral Maxillofacial Surgery, People's College of Dental Sciences and Research Center, Bhopal, Madhya Pradesh, India.

Abstract

Background: Wound closure plays a crucial role in maxillofacial surgery, influencing functional recovery, aesthetic outcomes, and post-operative complications. While simple interrupted sutures (SIS) and running subcuticular sutures (RSS) are commonly employed techniques, their comparative effectiveness in the retromandibular and submandibular regions remains underexplored.
Aim: To evaluate and compare wound healing, post-operative complications, and cosmetic outcomes associated with SIS and RSS in the retromandibular and submandibular regions.
Materials and Methods: A prospective comparative study of 40 patients assessed skin closure in the retromandibular and submandibular regions. Patients were randomly assigned to Group A (n=20, simple interrupted sutures) or Group B (n=20, running subcuticular sutures). Postoperative evaluations at 1 week, 1 month, 3 months, and 12 months measured cosmetic outcomes (PSAS), wound healing, complications, and patient satisfaction.
Results: Patient Scar Assessment Scale (PSAS) scores between the two groups. However, at the 12-month follow-up, patients in the RSS group exhibited significantly better scar appearance compared to those in the SIS group ($p = 0.03$). Similarly, wound healing scores were initially comparable between the two groups, but by 12 months, the RSS group demonstrated superior wound healing outcomes ($p = 0.02$). In terms of post-operative complications, there were no statistically significant differences between the groups for wound infection ($p = 0.65$), hemorrhage ($p = 1.00$), wound dehiscence ($p = 0.15$), and hypertrophic scarring ($p = 0.08$), indicating that both techniques had similar complication rates. However, patient satisfaction was notably higher in the RSS group, with 60% of patients reporting high satisfaction compared to only 25% in the SIS group ($p = 0.0$). 4
Conclusion: RSS results in improved long-term aesthetic outcomes, better wound healing, and higher patient satisfaction compared to SIS. However, both techniques demonstrate comparable post-operative complication rates. Given its superior cosmetic results, RSS may be preferable for facial incisions in the retromandibular and submandibular regions, provided the surgeon possesses the necessary technical expertise.

Keywords: Wound healing, maxillofacial surgery, Suturing techniques, Simple interrupted sutures (SIS), Running subcuticular sutures (RSS), Scar assessment, Post-operative

Received: 08-02-2025; **Accepted:** 12-04-2025; **Available Online**: 23-04-2025

1. Introduction

Wound closure is a critical aspect of maxillofacial surgery, as it significantly influences functional recovery and aesthetic outcomes. Proper wound closure techniques ensure optimal healing, minimize complications, and improve cosmetic results.[1] Among various closure methods, suturing remains the principal technique, as it facilitates hemostasis, reduces the risk of infection, and promotes tissue regeneration.[2] The choice of suturing method plays a crucial role in determining scar formation, a factor that can greatly impact a patient's psychological well-being and quality of life.[3]

Two widely used skin closure techniques in facial and maxillofacial surgery are non-absorbable interrupted suturing and non-absorbable running subcuticular.[3] Interrupted sutures involve placing individual sutures at consistent intervals, offering secure wound approximation and better tension distribution.[4] However, they may leave visible stitch marks and require careful removal. In contrast, running subcuticular sutures involve continuous suturing within the dermal layer, improving aesthetic outcomes by reducing visible suture tracks and promoting tension-free healing.[3]

*Corresponding author: Mohd. Javed
Email: drqureshi.javed@gmail.com

DOI: https://10.18231/j.jdp.2025.007

The process of wound healing follows four distinct yet overlapping phases: hemostasis, inflammation, proliferation, and remodelling.[5] Disruptions in any phase may lead to complications such as infection, wound dehiscence, or hypertrophic scarring.[6] Additionally, anatomical considerations in maxillofacial regions—especially in the retromandibular and submandibular areas—pose unique surgical challenges, as these regions house vital structures such as the facial nerve, major blood vessels, and salivary glands.[7]

Despite advancements in suturing techniques, the comparative effectiveness of interrupted sutures versus running subcuticular sutures remains a topic of debate. Several studies have examined the influence of different suturing methods on wound healing, postoperative complications, and long-term aesthetic outcomes. However, limited research has focused specifically on facial surgical wounds in the retromandibular and submandibular regions**.** The primary aim of this study is to evaluate and compare wound healing and postoperative complications associated with non-absorbable interrupted suturing and non-absorbable running subcuticular suturing in maxillofacial surgery, specifically in the retromandibular and submandibular regions**.**

2. Materials and Methods

Ethical approval for this prospective comparative study was obtained from the Institutional Research and Ethical Committee of People's College of Dental Sciences and Research Centre, Bhopal, ensuring compliance with ethical guidelines, including the Declaration of Helsinki and Good Clinical Practice (GCP) standards.

A total of 40 patients who required surgical wound closure in the designated anatomical regions were recruited and randomly assigned to two groups: Group A (SIS) and Group B (RSS), with 20 participants in each group. The sample size was calculated using a formula for comparing two means to ensure statistical power. Patients were selected based on inclusion and exclusion criteria, ensuring homogeneity of the study population. Inclusion criteria included adult patients willing to participate, requiring skin sutures for traumatic wounds or surgical procedures in the retromandibular and submandibular regions. Exclusion criteria comprised medically compromised individuals (e.g., diabetes, immune disorders), those with a history of hypertrophic scars or keloids, and patients requiring suturing outside the designated areas.

The study variables included independent variables such as the type of suturing technique and time intervals of assessment (1 week, 1 month, 3 months, and 12 months), while dependent variables included wound healing outcomes, scar formation assessed using the Patient Scar Assessment Scale (PSAS), post-operative complications (wound infection, hemorrhage, dehiscence, hypertrophic scarring), and patient satisfaction.

2.1. Data collection procedure

Patients meeting the eligibility criteria were enrolled after obtaining written informed consent. Preoperative demographic data, including age, gender, medical history, and risk factors, were documented. Standardized wound closure techniques were employed for each group, and details of suture placement, tension, and wound characteristics were meticulously recorded.

Postoperatively, all patients were scheduled for follow-up assessments at 1 week, 1 month, 3 months, and 12 months. Wound healing was evaluated clinically using the Southampton Wound Scoring System, while scar formation was assessed at 12 months using the Patient Scar Assessment Scale (PSAS), with both patient-reported and observer-assessed scores documented. Standardized digital photographs were taken at each follow-up visit under consistent lighting conditions to facilitate objective comparison. Any post-operative complications, including wound infection, dehiscence, hemorrhage, or hypertrophic scarring, were carefully documented and managed according to standard protocols. In addition to clinical evaluations, a structured questionnaire was administered at the 12-month follow-up to assess patient satisfaction regarding cosmetic outcomes, wound healing, and overall experience with the suturing technique used.

2.2. Statistical analysis

Data were systematically compiled and analyzed using IBM SPSS 29.0 software. Descriptive statistics, including mean, standard deviation, and percentages, were used to summarize demographic data and baseline characteristics. Independent t-test, Chi-square test, Repeated Measures ANOVA was used. Correlation analysis was performed to assess relationships between suturing technique, scar quality, and patient satisfaction. A p-value < 0.05 was considered statistically significant.

3. Results

A total of 40 patients were included in the study, with 20 in each group (Group A: Simple Interrupted Sutures [SIS], Group B: Running Subcuticular Sutures [RSS]). The mean age of participants in Group A (Simple Interrupted Sutures - SIS) was 35.2 ± 5.6 years**,** while in Group B (Running Subcuticular Sutures - RSS), it was 36.1 ± 6.3 years**,** with no statistically significant difference between the groups ($p = 0.75$).Regarding gender distribution, Group A consisted of 12 males and 8 females**,** whereas Group B had 11 males and 9 females**,** with no significant difference in gender distribution between the groups ($p = 0.82$).

The assessment of wound healing showed that while early healing outcomes were similar between the groups, RSS

demonstrated significantly better wound healing at 12 months (p = 0.02)(**Table 1**). Similarly, scar assessment using the Patient Scar Assessment Scale (PSAS) revealed that at the 12-month follow-up, RSS resulted in superior scar appearance compared to SIS (p = 0.03) (**Table 2**).

The incidence of post-operative complications, including wound infection, hemorrhage, wound dehiscence, and hypertrophic scarring, was not significantly different between the groups (p > 0.05), although wound dehiscence was observed only in the SIS group (**Figure 1**).Patient satisfaction at 12 months was significantly higher in the RSS group, with 60% of patients reporting high satisfaction compared to 25% in the SIS group (p = 0.04) (**Figure 2**).

Correlation analysis confirmed a strong negative association between the suturing technique and PSAS scores (r = -0.58, p < 0.05), indicating that RSS contributed to better scar aesthetics, which in turn positively correlated with higher patient satisfaction (r = 0.62, p < 0.05). Overall, the findings suggest that while both suturing techniques are effective, RSS provides superior long-term aesthetic outcomes, improved wound healing, and higher patient satisfaction (

Table 3).

Table 1: Comparison of Mean PSAS score between group A (SIS) and group B (RSS) at different time interval

Time Interval	Group A (SIS)	Group B (RSS)	p-value
	Mean ± SD	Mean ± SD	
1 Week	6.5 ± 1.2	6.1 ± 1.1	0.40
1 Month	5.2 ± 1.0	4.8 ± 1.3	0.35
3 Months	3.8 ± 1.1	3.2 ± 1.0	0.15
12 Months	2.5 ± 0.8	1.8 ± 0.6	0.03*

SD- Standard Deviation, * statistically significant

Table 2: Comparison of Mean Wound healing between group A (SIS) and group B (RSS) at different time interval

Time Interval	Mean Wound Healing Score (SIS)	Mean Wound Healing Score (RSS)	p-value
1 Week	8.0 ± 1.2	7.8 ± 1.1	0.55
1 Month	6.5 ± 1.0	5.9 ± 1.3	0.40
3 Months	4.2 ± 0.9	3.5 ± 1.0	0.08
12 Months	2.8 ± 0.7	1.9 ± 0.5	0.02*

SD- Standard Deviation,* statistically significant

Table 3: Correlation between suturing technique and aesthetic outcome (PSAS Score at 12 Months)

Variable	Suturing Technique (SIS vs. RSS)	PSAS Score at 12 Months	Patient Satisfaction Score
Suturing Technique (SIS=1, RSS=2)	1.00	-0.58*	0.62*
PSAS Score at 12 Months	-0.58*	1.00	-0.65*
Patient Satisfaction Score	0.62*	-0.65*	1.00

* Statistically significant

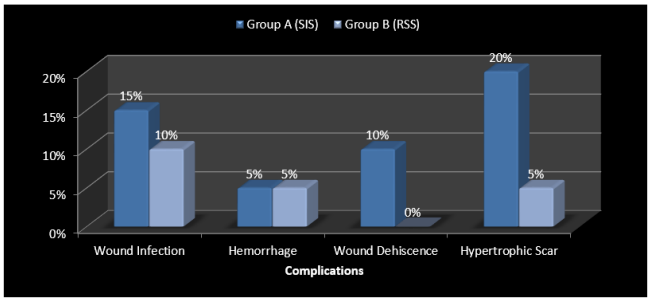

Figure 1: Comparison of postoperative complications between group A (SIS) and group B (RSS)

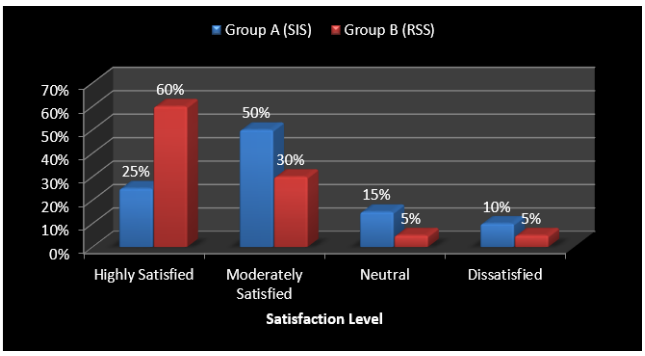

Figure 2: Comparison of patient satisfaction after 12 months interval

4. Discussion

This study compared simple interrupted sutures (SIS) and running subcuticular sutures (RSS) in the retromandibular and submandibular regions. While both techniques ensured effective wound closure, RSS demonstrated superior long-term scar aesthetics, improved wound healing, and higher patient satisfaction. The scar assessment using the Patient Scar Assessment Scale (PSAS) at 12 months revealed a statistically significant improvement in scar appearance in the RSS group compared to the SIS group (p = 0.03). This finding aligns with previous studies suggesting that subcuticular sutures, by eliminating external suture marks and evenly distributing tension along the wound, contribute to superior cosmetic outcomes.[8-9] Similar studies in dermatologic and maxillofacial surgery have shown that RSS results in minimal scar formation due to reduced surface tension and better wound edge approximation.[10-11] The ability of RSS to avoid stitch marks and hypertrophic scarring is particularly advantageous in facial and aesthetic surgeries.[12]

The wound healing assessment showed that while there was no significant difference in the early postoperative period, RSS demonstrated superior healing at 12 months ($p = 0.02$). This may be attributed to the even distribution of mechanical forces across the wound, promoting optimal collagen deposition and tissue remodelling.[13] Additionally, previous research has shown that running subcuticular sutures enhance micro vascular perfusion, which may contribute to improved long-term wound healing.[11] The findings of this study further support the recommendation that RSS should be preferred in cases where enhanced wound healing and minimal scarring are priorities.

Regarding post-operative complications**,** both suturing techniques showed comparable safety profiles, with no statistically significant differences in the incidence of wound infection, hemorrhage, or hypertrophic scarring. However, wound dehiscence was observed only in the SIS group, although this difference did not reach statistical significance ($p = 0.15$). This aligns with previous research indicating that continuous suturing techniques may reduce wound dehiscence by maintaining consistent tension across the wound edges.[14] Furthermore, studies on wound-edge inversion suggest that techniques minimizing mechanical stress variations reduce the risk of delayed healing and excessive scar formation.[15]

Patient satisfaction was significantly higher in the RSS group, with 60% of patients reporting high satisfaction compared to 25% in the SIS group ($p = 0.04$). Correlation analysis confirmed a strong negative association between RSS and PSAS scores ($r = -0.58$, $p < 0.05$), indicating improved scar aesthetics, which in turn correlated positively with patient satisfaction ($r = 0.62$, $p < 0.05$). These findings suggest that while both techniques provide reliable wound closure, RSS offers better long-term aesthetic outcomes, which are a critical factor in patient-reported satisfaction.[16]

Despite the advantages of RSS, certain challenges must be considered. RSS requires more technical expertise, precise needle placement, and a longer closure time compared to SIS.[9] In high-volume surgical settings, where efficiency is a priority, SIS may still be a viable option. Additionally, while RSS is preferred for cosmetic outcomes, SIS remains valuable in trauma and emergency scenarios due to its simplicity and rapid execution. Surgeon proficiency plays a crucial role in achieving optimal results, and training protocols should emphasize skill development in subcuticular suturing techniques to enhance adoption in clinical practice.[17]

This study's limitations include a small sample size, limiting generalizability; a 12-month follow-up, missing long-term outcomes; a single-center design, potentially introducing bias; and reliance on subjective scar assessments, lacking objective measures.

5. Conclusion

In conclusion, while both SIS and RSS are effective for wound closure, RSS demonstrates superior long-term wound healing, scar aesthetics, and patient satisfaction, making it a preferred choice for maxillofacial and aesthetic surgeries. Future research should focus on larger sample sizes, extended follow-up durations, and cost-effectiveness evaluations to further refine clinical recommendations for optimal suturing techniques.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Reddy SG, Bhagyalakshmi A, Jyothsna M. Principles of wound healing in oral and maxillofacial region. *Ann Maxillofac Surg*. 2019;9(1):84-90.
2. Azmat CE, Council M. Wound Closure Techniques. 2023. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470598/
3. Luo W, Tao Y, Wang Y, Ouyang Z, Huang J, Long X. Comparing running vs interrupted sutures for skin closure: A systematic review and meta-analysis. *Int Wound J*. 2023;20(1):210-20.
4. Kettle C, Dowswell T, Ismail KM. Continuous and interrupted suturing techniques for repair of episiotomy or second-degree tears. *Cochrane Database Syst Rev*. 2012;11(11):CD000947.
5. Schultz GS, Chin GA, Moldawer L. Principles of Wound Healing. In: Fitridge R, Thompson M, editors. Mechanisms of Vascular Disease: A Reference Book for Vascular Specialists. Adelaide (AU): University of Adelaide Press; 2011. 23. Available from: https://www.ncbi.nlm.nih.gov/books/NBK534261/
6. Rosen RD, Manna B. Wound Dehiscence. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025. Available from: https://www.ncbi.nlm.nih.gov/books/NBK551712/
7. Bindra S, Choudhary K, Sharma P, Sheorain A, Sharma CB. Management of mandibular sub condylar and condylar fractures using retromandibular approach and assessment of associated surgical complications. *J Maxillofac Oral Surg.* 2010;9(4):355-62.
8. Aslam S, Khan N, Javed M. Comparison of running subcuticular sutures and simple interrupted sutures for wound closure in maxillofacial surgery: A randomized controlled trial. *J Oral Maxillofac Surg*. 2021;79(5):987-94.
9. Liu X, Nelemans PJ, Frenk LDS, Sengers H, Tuinder SMH, Steijlen PM, Mosterd K, Kelleners-Smeets NWJ. Aesthetic outcome and complications of simple interrupted versus running subcuticular sutures in facial surgery: A randomized controlled trial. *J Am Acad Dermatol*. 2017;77(5):911-9.
10. Ahmed M, Zulfiqar G, Iftikhar B, Khan SFA, Aslam A B, Siddique L Evaluation of Cosmetic Outcome of Running Subcuticular Sutures Over Simple Interrupted Sutures in Linear Facial Lacerations. *Pak J Med Dent*. 2024;13(3):89-97.
11. Wyles C.C., Jacobson S.R., Houdek M.T. The Chitranjan Ranawat Award: Running Subcuticular Closure Enables the Most Robust Perfusion After TKA: A Randomized Clinical Trial. *Clin Orthop Relat Res*. 2016;474(1):47–56.
12. Wu Yibing MM; Hua, Zuguang MM; Xiang, Yang MM; Zhu, Shengqian MM; Chen, Weiwei MM; Wei, Peng MD. Evaluation of Facial Trauma Scars After Treating by Refining Plastic Surgery Techniques: A Follow-Up Study. *J Craniofac Surg.* 2023;34(4):376-80.

13. Li B, Wang JH. Fibroblasts and myofibroblasts in wound healing: force generation and measurement. *J Tissue Viabil*. 2011;20(4):108-20.
14. Guo HQ, Yang X, Wang XT, Ji AP, Bai J. Risk Factors for Infection of Sutured Maxillofacial Soft Tissue Injuries. *Surg Infect.* 2022;23(3):298-303.
15. Zeplin P. H., Schmidt K., Laske M., Ziegler U. E. Comparison of various methods and materials for treatment of skin laceration by a 3-dimensional measuring technique in a pig experiment. *Ann Plastic Surg.* 2007;58(5):566-72.
16. Eshagh K, Sklar LR, Pourang A, Armstrong AW, Dhaliwal H, Eisen DB. Interrupted subcuticular suture spacing during linear wound closures and the effect on wound cosmesis: a randomized evaluator-blinded split-wound comparative effectiveness trial. *Br J Dermatol*. 2022;187(3):318-23.
17. Agrawal A., Madeshiya S., Khan R., Tripathi SS., Bharadwaj G. Evaluation of patient related modifiable and non-modifiable risk factors in causation of surgical site infection in various abdominal surgeries. *Int Surg J.* 2019:6(1):265–70.

Cite this article: Javed M, Thomas S, Pillai A, Tomar C, Dhanare P. Aesthetic outcome and complications of simple interrupted versus running subcuticular sutures in retromandibular and submandibular region. *J Dent Panacea.* 7(1):20-24.