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To study Single layer suturing and 3 layers suturing in facial injury / laceration

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Abstract

Background & Methods: Aim is to the score outcome in Single layer suturing and multiple layers suturing in facial injury / laceration. Wounds with tissue loss or requiring extensive debridement) will benefit from multiple layers suturing by redistributing tension along the various planes in the laceration.

Results: While aspect like infection control, chronic is not as prescribed due to robust blood supply. Cosmetic outcome and functional restoration are the primary focuses when caring for facial lacerations, while aspects like infection control, pain, and emotional support are important but not as heavily prioritized.

Conclusion: Layer of deep sutures to simple interrupted percutaneous sutures for simple, non-gaping, short facial laceration repair prolongs wound closure and does not affect cosmetic outcome and scar width. Routine placement of deep sutures in all facial lacerations where dermis had been breached is warranted in today's times to give the most desirous and aesthetic outcomes.

Keywords: layer, suturing, facial & laceration.

Study Design: Observational Study.

Introduction

Familiarity with the pertinent anatomic aspects of the face is important. Clear anatomic boundaries are present that must be respected and carefully realigned to avoid obvious deformity. Cosmetic results are better when minimal tension is placed on the wound edges at the time of repair. Therefore, wounds with the long axis parallel to the natural skin tension lines have much better cosmetic outcomes[1]. The degree of tension on the wound edges can be estimated by measuring the distance the wound edges retract away from the center of the lesion. Marked retraction (>5 mm) indicates strong skin tension. With such wounds, placement of dermal sutures in a 2-layer closure should be considered[2].

Facial lacerations are cuts or tears in the skin of the face, often caused by trauma or injury. They can vary in severity, from minor cuts that only affect the top layer of skin to more extensive injuries that involve deeper tissues, such as muscles, blood vessels, and nerves. These kinds of lacerations can come about from various situations, such as accidents, falls, sports mishaps, physical altercations, and even surgical procedures[3].

The seriousness of a facial laceration depends on things like how deep, how long, and where the cut is. Minor lacerations might only need basic care for the wound, but if the cut is deeper or more complicated, it might need medical attention, like stitches or sutures[4].

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Facial laceration repair becomes necessary when there are cuts or tears on the skin of the face that require medical attention for proper healing and cosmetic outcomes[5-6]. The need for repair is determined by the severity and characteristics of the laceration.

Material and Methods

Present study was conducted at L.N. Medical College & Research Centre, Bhopal on 50 cases for 01 Year. Wounds with visual evidence of active local or systemic infection, gangrene, contaminated or devitalized tissue, or that were within active rashes were also excluded. Similarly, wounds involving deep vital structures (such as the orbicularis oris or levator palpebrae) were not included. A prior study has suggested that this level of experience is required for optimal cosmetic outcome.

Skin versus dermal/multilayer — The simple interrupted suture is the most common method used to close most small, uncomplicated, traumatic skin lacerations. Dermal (multilayer) closure is typically used for clean wounds with the following characteristics:

●Deep – closing the cutaneous layer alone will leave significant dead space, with the potential for hematoma or abscess formation

●Wide (gaping) – approximation of the dermis permits less tension at the skin level, which improves cosmetic outcome

Inclusion criteria: Patients if they were at least 1 year of age, were of generally good health without significant systemic abnormalities, agreed to return for 5-day and 3-month follow-up assessment, and provided written informed consent.

Exclusion criteria: were patients with multiple trauma, peripheral vascular disease, type I diabetes mellitus, known bleeding diathesis, or a known personal or family history of keloid formation or hypertrophic scars.

Eligible wounds included simple, linear, nonbite, nongaping (<10 mm in width) traumatic facial lacerations that required closure when one of the investigators was present. Wounds secondary to animal or human bites, punctures, decubitus ulcers, or crush injuries that resulted in a burst stellate laceration were excluded.

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Result

Table No. 1: Baseline Characteristics

S. No.	Characteristics	Single-Layer Closure	Double-Layer Closure
1	Mean ± SD age, years	15.9 ± 21.1	21.1 ± 19.0
2	Mean ± SD length, cm	1.9 ± 0.9	3.0 ± 3.9
3	Mean ± SD width (mm)	3.5 ± 1.8	2.8 ± 1.9

- Age: The Double-Layer Closure group is, on average, older, but both groups show high variability in age.
- Length: The Double-Layer Closure group has a greater mean length, but there is more variability in the measurements.
- Width: The Single-Layer Closure group has a slightly larger mean width, but again, the Double-Layer Closure group has more variation in the width measurements.

This suggests that the Double-Layer Closure group tends to show more variability across all characteristics, while the Single-Layer Closure group has more consistent measurements.

Table No. 2: Clinical Parameters

S. No.	Parameters	Single-Layer Closure		Double-Layer Closure	
		No.	%	No.	%
1	No. into subcutaneous fat	17	56	21	70
2	No. linear	20	68	21	70
3	No. irrigated	25	83	26	86
4	No. debrided	01	03	03	09
	Wound location	No.	%	No.	%
1	Forehead	12	41	11	36
2	Eyebrow	15	51	11	36
3	Chin	03	08	08	28

- **Subcutaneous Fat**: The **Double-Layer Closure** group involves subcutaneous fat more frequently than the **Single-Layer Closure** group.
- **Linear**: Both groups are quite similar in terms of linear arrangements, with a slight edge for **Double-Layer Closure**.
- **Irrigated**: The **Double-Layer Closure** group is marginally more likely to be irrigated.
- **Debrided**: The **Double-Layer Closure** group is more likely to involve debridement compared to the **Single-Layer Closure** group, although the difference is small.

In general, the **Double-Layer Closure** technique appears to involve more aggressive or thorough interventions (subcutaneous fat, irrigation, and debridement) compared to the **Single-Layer Closure** technique.

Overall, the Single-Layer Closure technique is more commonly associated with wounds on the eyebrow and forehead, whereas the Double-Layer Closure technique is more frequently used for wounds on the chin.

Table No. 3: Cosmetic Characteristics

S. No.	Characteristics	Suture Removal	Long-term Follow-up
1	Step-off	93%	97%
2	Contour Irregularity	89%	97%
3	Margin separation	80%	80%
4	Edge inversion	97%	97%
5	Excessive distortion	99%	96%
6	Appearance adjustment	96%	89%

In summary, the Suture Removal stage is associated with higher rates of immediate healing concerns, such as distortion and appearance adjustments, while Long-term Follow-up shows slight increases in issues like contour irregularity, but overall, the major characteristics stabilize over time.

Table No. 4: Important Aspect of Wound Care

S. No.	Aspect of Care	Facial Lacerations	Percentage	P Value
1	Normal function	08	27	.045112
2	Avoiding infection	04	14	
3	Cosmetic outcome	10	33	
4	Least pain	04	11	
5	Length of stay	02	08	
6	Compassion	02	07	

The chi-square statistic is 5.6429. The *p*-value is .045112. The result is significant at $p < .05$.

- Cosmetic outcome is the most heavily prioritized aspect of care (33%), reflecting the importance of aesthetics in facial injury management.
- Normal function (27%) is also a major concern, ensuring the affected area can perform its usual tasks.

- Avoiding infection (14%) and pain management (11%) are important but slightly less critical compared to function and appearance.
- Length of stay (8%) and compassion (7%) receive the least focus in the care of facial lacerations, indicating that the immediate medical outcomes (such as function and appearance) are the top priorities, while emotional support and hospitalization duration are secondary considerations.

Cosmetic outcome and functional restoration are the primary focuses when caring for facial lacerations, while aspects like infection control, pain, and emotional support are important but not as heavily prioritized.

Discussion

Wound healing is a complex array of processes that starts immediately after injury and continues for many years after physical integrity of the wound has been re-established. The attainment of tensile strength and the formation of a cosmetically and functionally acceptable scar. however. Usually occur within a relatively short period of six to 12 month[7]. The content of collagen in the wound steadily increases between the sixth and the 17th days following repair. Collagen content increases little after this time. and is almost non-existent after the 32nd day. Any gain in tensile strength after the third week is primarily due to remodeling of already deposited collagen. This remodeling of collagen is dependent on both the static and the dynamic forces that stretch the wound over the underlying bony framework. The ultimate appearance of the wound may be more dependent on these forces and less dependent on the surgical skills of the suturer[8].

Most wounds should have primary closure (immediate approximation of wound edges) to reduce the patient's discomfort and speed healing. There is a direct relation between the time from the injury to closure of the laceration and the risk of subsequent infection, but the length of this "golden period" is highly variable. Wounds at low risk for infection can be closed 12 to 24 hours after the injury, but for wounds at high risk (contaminated wounds, those in locations with poor vascular supply, and those in immunocompromised patients), primary closure should take place within approximately 6 hours.

Soft-tissue injuries developing from the impact of shearing or stripping forces are termed degloving injuries. These injuries lead to separation or division of the skin and subcutaneous tissue from underlying bones, compromising adjoining structures including fascia, muscles, blood vessels, and nerves [9]. Degloving soft-tissue injury comprises 4% of all traumatic injuries. Extensive comminuted multiple mandibular fractures occur when a high-energy/high-velocity force or impact is exerted over any region of the mandible. This type of high-energy/high-velocity impact is commonly seen in gunshot injuries, road traffic accidents, assaults with sharp objects, and falls from heights. It can generate enough concentrated force to cause multiple comminuted fractures of the mandible. Degloving soft-tissue injuries can be classified as either open or closed. Open degloving injury usually present as avulsions and commonly occur in the head and neck region. Closed degloving injuries manifest as a cavity filled with haematoma and commonly occur in the trunk and extremities [10]. The treatment of open degloving injuries scales from meticulous debridement and primary skin closure to complex reconstruction surgery involving local flaps, skin grafts, or microvascular free flaps, depending on the site, extent, and severity of

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the injury. Delay in the treatment of these degloving injuries can lead to infection, full-thickness necrosis, or necrotising fasciitis of the avulsed flap [11].

Conclusion

Layer of deep sutures to simple interrupted percutaneous sutures for simple, non-gaping, short facial laceration repair prolongs wound closure and does not affect cosmetic outcome and scar width. Routine placement of deep sutures in all facial lacerations where dermis had been breached is warranted in today's times to give the most desirous and aesthetic outcomes.

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