

THE ART AND SCIENCE OF SUTURING TECHNIQUES

Akriti Mahajan⁽¹⁾, Amandeep Singh⁽²⁾

Desh Bhagat Dental College and Hospital, Mandi Gobindgarh, Punjab, India

ABSTRACT

The selection of a suturing technique is a critical decision in wound management. Mastery of the various methods allows a surgeon to match the technique to the specific wound, optimizing healing, minimizing complications, and achieving the best possible cosmetic and functional outcome.

KEYWORDS: Suturing, suture material, wound management.

INTRODUCTION:

Suturing is a fundamental surgical skill for closing wounds, promoting healing, and achieving optimal aesthetic outcomes. Beyond a simple stitch, suturing is a nuanced art that requires selecting the right technique for the specific wound, tissue, and tension. This article explores the principles of effective suturing and outlines several common techniques.

Core principles of effective wound closure

Regardless of the technique used, certain principles guide successful suturing:

- **Aseptic technique:** Maintain a sterile field to minimize the risk of infection.
- **Gentle tissue handling:** Use forceps or skin hooks with a light touch to avoid crushing tissue, which can impair healing.
- **Even approximation:** Ensure the skin edges meet perfectly. Asymmetric bites can cause an uneven "step-off" deformity.
- **Eversion of wound edges:** The edges should be slightly "puckered" outward. This prevents the formation of a depressed scar, which can result from scar contraction during healing.
- **Tension management:** Minimize tension on the skin surface. When significant tension is present, deep sutures should be used to support the closure.
- **Eliminate dead space:** Prevent gaps beneath the skin, where blood or fluid can collect and become a site for infection.

Common suturing techniques

1. Simple interrupted suture

This is the most common and versatile suturing method. Each stitch is placed and tied individually.

- **Technique:** The needle is inserted perpendicular to the skin, passes through the tissue, and exits on the opposite side at an equal depth and distance from the wound edge. Each stitch is individually knotted.
- **Advantages:** Offers maximum wound security, as the failure of one stitch does not affect the others. It provides precise control over tension and wound edge alignment.
- **Disadvantages:** It is more time-consuming to place than continuous sutures. It also carries a greater risk of "railroad track" scarring if left in too long, though this can be mitigated by early removal.

2. Simple continuous (running) suture

This technique uses a single, continuous strand of suture material to close the entire length of the wound.

- **Technique:** The first stitch is tied with a knot, but the suture is not cut. The needle continues to be passed along the wound in a series of even stitches, and a final knot is tied at the end.
- **Advantages:** It is much faster to place than interrupted sutures and provides an even distribution of tension.
- **Disadvantages:** If the suture breaks, the entire wound could potentially dehisce (reopen). It is best suited for long, straight, low-tension wounds.

3. Mattress sutures

Mattress sutures are designed to provide extra strength and promote wound eversion, making them ideal for high-tension areas or sites with a tendency for inversion.

- **Horizontal mattress suture:** A simple stitch is followed by a parallel pass in the opposite direction. This creates a strong, everting closure that disperses tension along the wound rather than concentrating it at the edges.
- **Vertical mattress suture:** This technique uses a "far-far, near-near" pattern, inserting and exiting the needle at four

points. It is particularly effective for closing deep spaces and ensuring maximum wound edge eversion.

4. Deep dermal suture

Also known as buried or inverted sutures, this technique closes the deeper layers of a wound, providing support and relieving tension on the skin surface.

- **Technique:** An absorbable suture is passed through the dermis, staying beneath the surface of the skin. The knot is buried within the wound to minimize irritation.
- **Advantages:** By eliminating dead space and taking the tension off the epidermis, this method promotes healing and leads to a finer, less noticeable scar.
- **Uses:** Used for wounds under moderate-to-high tension or for cosmetic closures where fine scarring is desired.

5. Subcuticular suture

A continuous subcuticular stitch is often used for cosmetically sensitive areas, as it leaves no external suture marks.

- **Technique:** The suture is placed in a continuous, running fashion within the dermal layer. It is started and ended by entering and exiting the skin at the apex of the wound, effectively burying the entire suture.
- **Advantages:** Produces an excellent cosmetic result with no "railroad track" scarring.
- **Considerations:** This technique is only suitable for low-tension wounds where the deep layers have already been approximated.

Conclusion

The selection of a suturing technique is a critical decision in wound management. Mastery of the various methods allows a surgeon to match the technique to the specific wound, optimizing healing, minimizing complications, and achieving the best possible cosmetic and functional outcome.

By adhering to core principles and understanding the purpose of each technique, medical professionals can elevate suturing from a simple task to a skilled surgical art.

References:

1. Kamann WA, Grimm WD, Schmitz I, Müller KM. Die chirurgische Naht in der Zahnheilkunde. Parodontologie (Berl). 1997;4:295-310.
2. Siervo S, Lorenzini L. Suturing techniques in oral surgery. Quintessenza Edizioni; 2008.
3. Hochberg J, Meyer KM, Marion MD. Suture choice and other methods of skin closure. Surg Clin North Am. 2009; 89:627 – 641
4. Evaskus DS. General principles and techniques of surgery. In Laskin DM (Eds). Clinician's Handbook of Oral and Maxillofacial Surgery, 1st edition. Illinois, USA: Quintessence Publishing, 2013. pp. 255-91.
5. Takei HH, Carranza FA. The periodontal flap. In: Newman MG, Takei HH, Carranza FA (Eds). Carranza's Clinical Periodontology, 8th edition. Philadelphia, PA, USA: W.B. Saunders; 1996. pp. 592- 604.
6. Kumar K, Sharma RK, Tewari S, Narula SC. Use of modified vertical internal mattress suture versus simple loop interrupted suture in modified Widman flap surgery: a randomized clinical study. Quintessence International. 2019 Oct 1;50(9).
7. Hupp JR, Ellis III E, Tucker MR: Contemporary Oral And Maxillofacial Surgery (ed 6). St. Louis, MO, Elsevier, 2014.
8. Application of figure-of-eight suture for mandibular third molar surgery: A prospective cohort study Qingtong Zhao¹, Yuqiong Zhou², Mengyu Li², Yejia Yu², Shaoyi Wang² * International Journal of Sciences & Applied Research, 7(5), 2020; 03-10.
9. Meyle J. Suture Materials and Suture Techniques. Periodontal Practice Today. 2006 Sep 1;3(4).
10. Burkhardt R, Lang NP. Influence of suturing on wound healing. Periodontology 2000. 2015 Jun;68(1):270-81.