The Modified Continuous Double Locking Suture: A Novel Suturing Approach in Dental Implant Surgery

Mohammad Reza Talebi Ardakani[a], **Zeinab Rezaei Esfahrood**[b], **Shireen Shidfar**[a, c*]

[a] Department of Periodontics, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran; [b] Department of Periodontics, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran; [c] Department of Periodontics, School of Dentistry, Qom University of Medical Sciences, Qom, Iran.

Corresponding author: Shireen Shidfar, Department of Periodontics, School of Dentistry, Qom University of Medical Sciences, Qom, Iran. ***E-mail***: shireen@yahoo.com; ***Tel***: 00989121155380

Submitted: 2019-06-24; **Accepted:** 2019-09-17; **Published Online:** 2019-09-30; **DOI:** *10.22037/rrr.v4i4.29761*

Introduction: An alternative to interrupted sutures for implant surgery at sites of edentulous ridges is the continuous locking suture, however it tends to loosen and time-consuming as the result. **Methods and Materials:** The modified continuous double locking suture is a modification of continuous locking suture, which is designed to approximate flap margins of an edentulous area. **Results:** Application of modified continuous double locking suture, reduces the chance of suture loosening by adding an extra knot at each area. **Conclusion:** By utilizing modified continuous double locking suture, it is easier to manipulate flap margins; nonetheless, more studies are needed to evaluate its efficacy in dental practice.

Keywords: Dental Implants; Oral Surgery; Periodontics; Subperiosteal Dental Implantation; Sutures

Introduction

During past decades, dental implant placement procedures have gradually undergone constant enhancements to facilate flap management and enhance suture designs (1).

The purpose of suturing is to approximate surgical flap margins to ensure wound adaptation and optimal healing (2). The periodontist has a wide variety of suture materials and techniques available to facilitate closure of soft tissue flaps in an edentulous ridge. Perhaps the easiest and most common of suturing is the interrupted suture technique (3). One disadvantage of placing interrupted sutures is that a knot must be tied for each suture placed(4). This can take considerable time and results in knots tied with unequal tightness. Knots can collect debris, irritate underlying soft tissue, and contribute to postsurgical pain (5).

An alternative to interrupted sutures for the edentulous ridges is the continuous locking suture technique. This technique has the advantage of requiring only two knots and allowing controlled tension on the flap margin throughout the suturing procedure, however it tends to loosen and is time consuming if a suture loosens (6). The modified continuous double locking suture is a modification of continuous locking suture which is designed to approximate flap margins of an edentulous area in a way that there is lower chance of suture loosening by adding an extra knot at each area. Therefore, it is easier to manipulate flap margins.

Methods and Materials

Preparation of the surgical site

Crestal incisions are performed prior to implant placement. Mucoperiosteal flaps are raised. Almost every implant site could be a candidate of this suture utilization. In the procedures described here, the suture material of choice could be of any type and any diameter according to the tissue biotype and type of augmentation procedures.

Modified Continuous Double Locking Suture

Modified continuous double locking sutures are placed in every edentulous region post implant surgery. The needle is inserted buccally through the flap and passes the lingual/palatal flap from the inner part. A knot is tied on the buccal aspect (Figure1). Then, the needle is inserted 3-4 mm adjacent to the first entry in the buccal site, passes the lingual/palatal flap from the inner part one more time (Figure 2) and the loop of suture that is rotated 2 times clockwise (Figure 3). Afterwards, the needle is passed through the loop (Figure 4). The needle continues suturing in lingual/palatal site. The procedure is repeated for complete closure of flap (Figure 5).

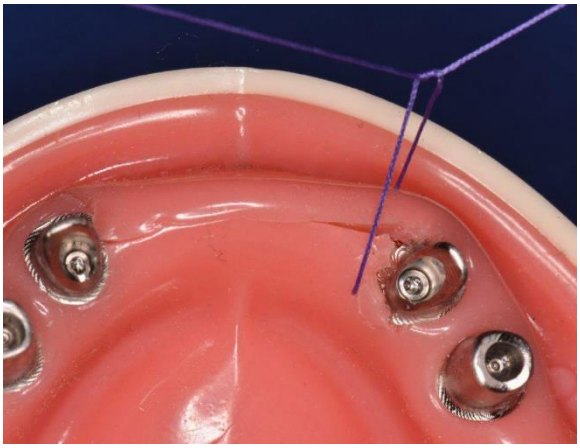

Figure 1. A knot is tied on the buccal aspect similar to the known continuous locking suture

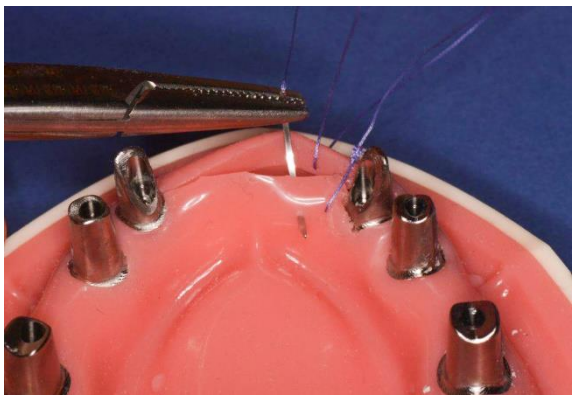

Figure 2. The needle is inserted 3-4 mm adjacent to the first entry in the buccal site, passes the lingual/palatal flap from the inner part one more time

Protection of the surgical site, postoperative recommendations, and medications

No periodontal dressing is used to protect the operating site. Patients are instructed to consume soft food and avoid brushing the operated area during the first postoperative week. Cleaning is ensured by chlorhexidine mouthwash. Sutures are removed after 7 days, after which brushing is allowed using an extra soft brush before resuming normal hygiene after 2 weeks. An antibiotic (Amoxicillin, 2 g/day) is administered for 7 days.

Results

Because of adding two loop rotations to the conventional continuous locking suture, the sutures remain tight as the procedure continues and there would be no need for checking the tightness of flap closure after each tissue perforation by needle.

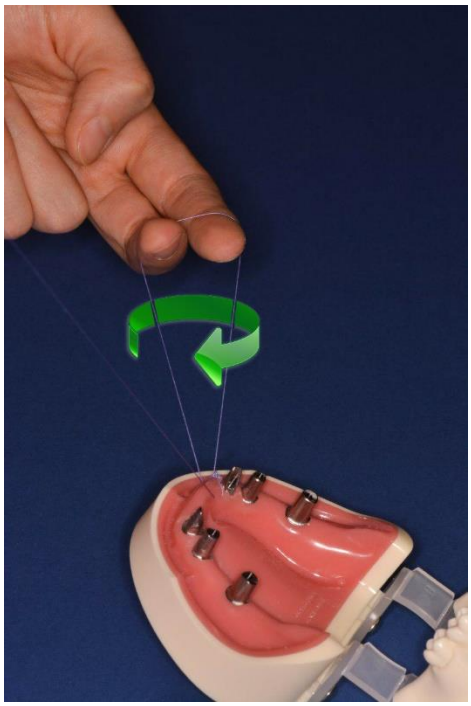

Figure 3. The loop of suture is rotated two times clockwise

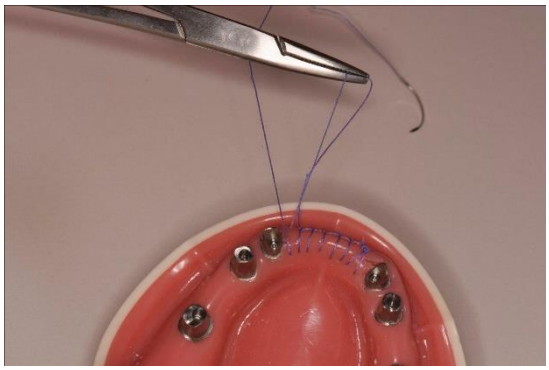

Figure 4. Afterwards, the needle is passed through the rotated loop

Discussion

Within a week from a dental implant surgery, the tissues confront variety of inflammatory responses and different degrees of edema can occur (7). Proper Flap adaptation and stability is crucial to predictable implant and bone augmentation procedures success.

Sutures are one of the key components of success in implant surgery (8). During the healing process, they allow intimate contact between the operated tissues, proper wound stabilization for rapid primary healing, traction for coronal repositioning, and harmonious gingival tissue display (9). The

selection of the suture type and its distribution along the surgical site are therefore vitally important. The modified continuous double locking suture described here meets these expectations and is suitable for a wide variety of challenging clinical situations where treatment with dental implants may be indicated, including extend flap designs for implant placement.

The continuous locking suture is extensively used in extended flap designs (10). During the procedure, the clinician must pay full attention to perform suturing while pulling the suture in order not to allow it to loosen. This is time-consuming and may hamper the operator from concentration on other aspects of surgery.

By adding two counterwise rotation of loop, the suture will maintain its tightness during the procedure and the weeks post-surgery.

Conclusion

The modified continuous double locking suture in the approach described can be applied in a large variety of challenging clinical situations where extended flaps in implant placement is indicated. The technique seems to offer the ability to move and stabilize the flap in the desired position, while least time is consumed and the risk for suture loosening decrease. An extended follow-up would be ideal to assess the long-term stability of the repositioned soft tissues and comparison with the already published suturing techniques.

Conflict of Interest: 'None declared'.

References

1. Sullivan RM. Implant dentistry and the concept of osseointegration: a historical perspective. J Calif Dent Assoc. 2001;29(11):737-45.
2. Landsberg CJ. Complete flap coverage in augmentation procedures around dental implants using the everted crestal flap. Practical Periodontics And Aesthetic Dentistry. 1995;7:13-28.
3. Moy RL, Waldman B, Hein DW. A review of sutures and suturing techniques. The Journal of dermatologic surgery and oncology. 1992;18(9):785-95.
4. Silverstein LH, Kurtzman GM, Shatz PC. Suturing for optimal soft-tissue management. Journal of Oral Implantology. 2009;35(2):82-90.
5. Kleier DJ. The continuous locking suture technique. Journal of endodontics. 2001;27(10):624-6.
6. Alzacko SM, Majid OW. "Security loop" tie: a new technique to overcome loosening of surgical knots. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics. 2007;104(5):e1-e4.
7. Araújo MG, Sukekava F, Wennström JL, Lindhe J. Ridge alterations following implant placement in fresh extraction sockets: an experimental study in the dog. Journal of clinical periodontology. 2005;32(6):645-52.
8. Zuhr O, Akakpo DL, Hürzeler M. Wound closure and wound healing. Suture techniques in contemporary periodontal and implant surgery: Interactions, requirements, and practical considerations. Quintessence International. 2017;48(8).
9. Burkhardt R, Lang NP. Influence of suturing on wound healing. Periodontology 2000. 2015;68(1):270-81.
10. Griffin TJ, Hur Y, Bu J. Basic Suture Techniques for Oral Mucosa. Clinical Advances in Periodontics. 2011;1(3):221-32.

Please cite this paper as: Talebi Ardakani MR, Rezaei Esfahrood Z, Shidfar SH. The Modified Continuous Double Locking Suture: A Novel Suturing Approach in Dental Implant Surgerye. Regen Reconstr Restor. 2018;3(1): 148-150. Doi: 10.22037/rrr.v4i4.29761