

Suturing Vs Non-Suturing Techniques in Oral Surgery –A Review of Literature

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Abstract: Suturing is technique of bringing tissue together and holding them in juxtaposition until the tissue healing occurs. Since wound does not gain strength for 4-6 days, the tissue should be approximated till then by sutures. To overcome the disadvantages of sutures, various non-suturing techniques have been introduced which includes staples, wound closure tapes, and tissue adhesives and ferrous sulphate. So this article is an attempt to compare between the two techniques and find out the effective one.

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I. Introduction

The suture indicates the repairing surgical act that allows the approximation of wound edges and maintaining it until the healing process will confer to same wound the intrinsic force sufficient to maintain itself without the necessity of mechanical support⁽¹⁾. Besides its advantages sutures can have its flaws too, which includes retention of plaque, severe tissue inflammation caused by breakdown products of absorbable suture material and delayed wound healing. Increased susceptibility to microbial invasion, pain, tissue and stitch abscess etc.,

In addition, the time consumed during surgery is also increased with which invariably might cause increased post-operative pain. To overcome these loopholes, replacement to conventional suturing have been developed. Some practitioners have recently recommended the use of innovative surgical techniques as a measure of precluding the need for sutures⁽²⁾. The advantages of these non-suturing techniques include less post operative pain, swelling, trismus, increased patient compliance and reduce the surgical time.

II. History Of Sutures

Sutures have been in use for thousands of years and are used to hold wounds together until the healing process is complete. They were first described as far back 3000 B.C. in ancient Egyptian literature. For centuries they were made from plant materials like hemp, cotton, animal materials such as tendons, silk and arteries. The material of choice for many centuries was catgut(13). In the 1800's the physician Joseph Lister introduced a technique for sterilisation of catgut and it was perfected finally in 1906.

Early in 20th century synthetic materials were developed that could be used for suturing. These synthetic materials were categorised into absorbable and non absorbable depending on their ability to be absorbed during the healing phase. Absorbable sutures dissolve within 10 days -8 weeks, whereas non absorbable sutures don't dissolve naturally and are usually removed after the wound has closed.

Additional new technologies have added laser technology and surgical glue to the tools available to physicians for wound healing and promotes scar less wound healing.

SUTURING TECHNIQUES AND MATERIALS USED

The suturing involves various techniques which employs the skills and watchful eye of the practitioner.

Common techniques employed for suturing includes the following

- 1.Interrupted suture-simple
- 2.Horizontal mattress
- 3.Continuous mattress
- 4.Vertical mattress

- 5. Corner stitch
- 6. Subcuticular sutures

MATERIALS USED

- 1. Suturing needles
- 2. Suturing materials

The commonly used suture material includes

SUTURE MATERIALS	ABSORBABLE	NON ABSORBABLE
MONOFILAMENT	Surgical gut Collagen Monocryl Polyglactin	Polyamide Polypropelene Stainless steel Polyester
MULTIFILAMENT	Polyglycolic acid Polyglactin -910	Surgical silk Surgical linen Cotton Polyamide braided Polyester braided Stainless steel

NON SUTURING TECHNIQUES

The non suturing techniques includes use of staples, wound closure tapes, adhesives

STAPLES

The principles of using staples is similar to the stapling device in which the staples are used for wound approximation .the staples provide fastest method of wound closure and was reported with decreased wound infections. These staples are made of high quality stainless steel, which is less reactive when compared to suture materials. This stapling of wound requires minimal skin penetration and hence can be used in lengthy wounds in the extremities and carries relatively less number of microorganisms. Besides all its advantages staples are more costlier compared to conventional sutures and also requires technical skills for its placement particularly in eversion of wound edges.

ADHESIVE TAPES

Adhesive tapes or strips are the tapes made up of microporous material with adhesive on one side .These may be used as additional support for wounds that have been approximated with the surgical adhesive. These tapes can be used alone or in conjunction with suture or adhesives or staples and used in non-tension and non-exudative zones. The advantages of these over suturing includes no suture marks and comparatively lower incidence of infection.

ADHESIVES AND SUPERGLUES

A cyanoacrylate material developed in the last few years had underwent few changes in its properties to overcome its disadvantages and led to the development of N-2-butyl cyanoacrylate glue(superglue). It is a liquid monomer which polymerises on contact with substance such as blood, saliva and becomes sticky. This material can be used in addition to areas with sutures in areas with increased tensile forces. This adhesives reduces the working time of 20-30 secs when compared to conventional suturing.

SUTURE LESS TECHNIQUE

The suture less technique involves the approximation of the flaps without suturing. This suture less technique was found to have less post operative pain, swelling and reduced incidence of trismus⁽¹²⁾.

COMPLICATIONS OF SUTURING TECHNIQUES.

Though suturing techniques aids in wound healing process by close approximation of the wound margins, it has some complications. The immediate complication includes hematoma formation and development of infection. Late complication includes pain, swelling, abscess formation, suture material acts as a reservoir of microorganisms and may aid in the retention of plaque, severe inflammation caused by the breakdown products of the absorbable suture materials. Other complication may include hypertrophic scar formation and keloid formation, stitch marks and wound necrosis.

PRECEDENCE OF NON SUTURING TECHNIQUES

Although suturing post surgically has many benefits it has its demerits, to overcome these non suturing techniques were developed whose properties were superior to suturing techniques. It includes less surgical time

and is esthetically far more superior to suturing techniques. non suturing techniques can be used in patients who are unable to co operate due to its less surgical time. It has less postoperative pain, swelling and trismus. Inflammation is reduced with the non suturing techniques.

III. Discussion

Several suture materials are available for medical and dental procedures. however, it is essential for the surgeons to be aware of the suturing and non suturing techniques and its implications⁽⁴⁾. This is a critical issue because the surgeon must ensure that suture will retain its strength until the wound edges are approximated.

Mehdi Ghoreishian et al., in the year 2009 conducted a comparative study between the tissue adhesives and suturing for closure of the surgical wounds after removal of the mandibular third molars and concluded that the wound closure were similar in the severity of pain but the use of cyano acrylate results in better hemostasis⁽³⁾.

Fawad Javed et al., in the year reviewed an article, Tissue reactions to various sutures in oral surgical interventions and concluded that silk though used as a common material in suturing techniques showed⁽⁵⁾ increased inflammation when compared to nylon, polyurethane, ePTFE, PGA^(6,7).

Katz et al.,⁽⁸⁾ investigated the capability of bacteria to adhere to various types of sutures and result showed five to eight fold increase in bacterial adherence to silk suture when compared to nylon.

Peter D. Waite et al, studied surgical outcomes for suture less surgery in 366 impacted third molar patients and he stated that small flap third molar surgeries without sutures are less invasive and saves time⁽⁹⁾

The clinical studies reviewed by Eduardo Borie, demonstrated convincing result regarding the safety, potency, ease of application and feasibility of all types of cyanoacrylates adhesives used in intra and extra oral procedures.

S. Karthikeyan et al., in the year 2018, studied the outcome of the wound closure and concluded that the incidence of wound infection, pain score, time taken for suturing are lesser in stapler group compared to conventional group⁽¹⁴⁾.

Jitender et al., in the year 2015, compared the skin staples and standard sutures for closing incisions after head and neck surgery and found that the wound closure was 10 times faster than sutures, but cost factor which is double than the suture material, and similar results in patient's comfort and esthetics⁽¹⁵⁾.

D.M. Shivamurthy et al., attempted a comparative study on octyl-2-cyanoacrylate and conventional sutures in facial skin closure and concluded that the use of cyanoacrylate offered many advantages like rapidity, ease of application and superior results⁽¹⁶⁾.

Though suture and the suturing techniques in Oral surgeries have certain applications, a small flap left open in a suture less technique facilitates good hygiene and improves drainage. inflammation and cost. On the other hand, thenon suturing techniques has an increased advantage of esthetics and reduced scar formation.

IV. Conclusion

The incidence of wound infection is lesser in non suturing techniques when compared to the suturing techniques. Patient compliance is increased in non suturing techniques because of increased esthetics, less post operative pain, swelling, good hemostasis, less surgical time. In summary, in vivo and clinical studies have demonstrated the efficacy, ease of application and esthetic consideration of the non suturing techniques is more promising when compared to the suturing techniques.

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