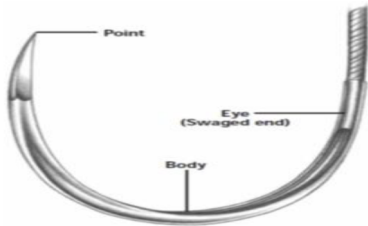


**SUTURE NEEDLE:**

The purpose of the suture needle is to introduce the suture into the tissue for apposition.<sup>32</sup>

**The Anatomy of a Needle or Needle components<sup>32</sup>** - Every surgical needle has three basic components:

a) The eye. b) The body. c) The point.

**Needle components**

**a) The Needle Eye 32** - The eye falls into one of three categories: Closed eye, French (split or spring) eye, Swaged (eyeless).

- **Closed eye needles** is similar to a household sewing needle. The shape of the eye may be round, oblong, or square.
- **French eye needles** have a slit from inside the eye to the end of the needle with ridges that catch and hold the suture in place.
- **Swaged needle** have a configuration that joins the needle and suture together as a continuous unit--one that is convenient to use and minimizes trauma.

Swaged sutures offer several advantages to the surgeon, nurse, and patient.

1. The scrub person does not have to select a needle when the surgeon requests a specific suture material since it is already attached.
2. Handling and preparation are minimized. The strand with needle attached may be used directly from the packet. This helps maintain the integrity of the suture strand.
3. Tissues are subjected to minimal trauma.
4. Tissue trauma is further reduced because a new, sharp, undamaged needle is provided with each suture strand.
5. Swaged sutures do not unthread prematurely.
6. If a needle is accidentally dropped into a body cavity, the attached suture strand makes it easier to find.
7. Swaged sutures eliminate suture fraying or damage due to sharp corners in the eye of eyed needles.



**b) The Needle Body** The body of the needle is the portion which is grasped by the needle holder during the surgical procedure. The curvature of the needle body may come in a variety of different shapes. The shapes can be straight, half curved, curved (1/4, 3/8, 1/2, 5/8) and compound curved.<sup>32</sup>

straight    Half curved    1/4 circle    3/8 circle    1/2 circle    5/8 circle    Compound curved



**c) The Needle Point** The point extends from the extreme tip of the needle to the maximum cross-section of the body. Each needle point is designed and produced to the required degree of sharpness to smoothly penetrate specific types of tissue. The various needle points are conventional cutting, reverse cutting, precision point cutting, tapercut, taper side, cutting spatula, blunt.

**Types of Needles 32**

**Conventional Cutting Needles** In addition to the two cutting

edges, conventional cutting needles have a third cutting edge on the inside concave curvature of the needle. The shape changes from a triangular cutting blade to that of a flattened body on both straight and curved needles. The narrow point, fine wire diameter, and fine taper ratio allow superior penetration of soft tissue.



**Reverse Cutting Needles** These needles were created specifically for tough, difficult-to-penetrate tissue such as skin, tendon sheath, or oral mucosa. The third cutting edge is located on the outer convex curvature of the needle. This offers several advantages:

- Reverse cutting needles have more strength than similar-sized conventional cutting needles.
- The danger of tissue cutout is greatly reduced.
- The hole left by the needle leaves a wide wall of tissue against which the suture is to be tied.



**Taper Point Needles (round needles)** Taper point needles pierce and spread tissue without cutting it. The needle point tapers to a sharp tip. The needle body then flattens to an oval or rectangular shape. This increases the width of the body to help prevent twisting or turning the needle holder.



**Tapercut Surgical Needles** Tapercut needles which combine the features of the reverse cutting edge tip and taper point needles. Three cutting edges extend approximately 1/2" back from the point. All three edges are sharpened to provide uniform cutting action. The point, sometimes referred to as a trocar point, readily penetrates dense, tough tissue.

**SUTURING TECHNIQUES**

Different suturing techniques may employ:<sup>10</sup>

**A.. Interrupted suturing**

- a. Simple/ Circumferential/ Direct loop
- b. Figure of eight
- c. Mattress - i) Vertical ii) Horizontal
- d. Sling suture
- e. Anchor suture

**B. Continuous suturing**

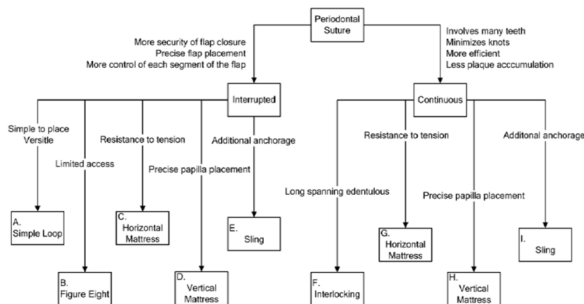
- a. Interlocking
- b. Mattress i) Horizontal ii) Vertical
- c. Sling
- d. Periosteal Suture<sup>1</sup>

**C. Modifications**

- a) Specialized interrupted suturing techniques for bone regeneration in retromolar and tuberosity areas. Laurell modification<sup>10</sup>

- b) Modified flap suturing techniques<sup>10</sup>
- c) Retromolar suture modification for primary coverage<sup>10</sup>
- d) Modified anchore vertical mattress<sup>46</sup>
- e) Modified anchore horizontal mattress<sup>46</sup>

### Summary of suturing techniques<sup>44</sup>

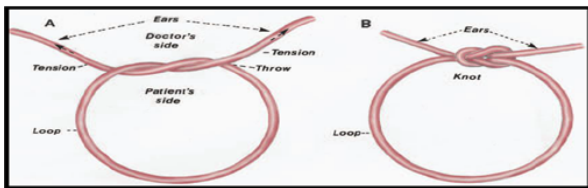


The choice of suturing technique is generally made on the basis of a combination of the Individual operator's preference  
-Educational background Skill level Surgical requirements

### PARTS OF A SUTURE

A suture has **three components** (Thacker and colleagues, 1975):<sup>10</sup>

1. **The loop**
2. **The knot** itself, which is composed of a number of tight "throws"; each throw represents a weave of the two strands
3. **The ears**, which are the cut ends of the suture



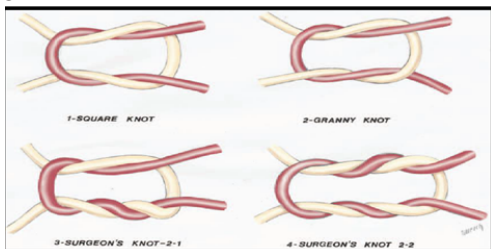
### KNOTS

"**Suture security** is the ability of the knot and material to maintain tissue approximation during the healing process" (Thacker and colleagues, 1975). Failure is generally the result of untying owing to knot slippage or breakage.<sup>10</sup>

The 2 ends of the suture are pulled in opposite directions with uniform rate and tension, the knot may be tied more securely.

The most frequently used knot tying techniques with accompanying illustrations of finished knots are - 32

1. Square knot,
2. Granny knot,
3. Surgeon knot 2 – 1
4. Surgeon knot 2-2.



### SUTURE REMOVAL

Sutures should be removed at the earliest possible time to prevent or minimize suture reaction and suture marks but they should remain in place long enough to prevent wound dehiscence and scar spread.<sup>48</sup> This time period is usually between 5 and 10 days, and in most instances, these sutures are removed in 7 days.<sup>10</sup>

### Method of suture removal<sup>10</sup>

1. The scaler is used to remove the dressing. The dressing should

be loosened first in an apicocoronal direction. This will place the tension against the teeth and not the tissue.

2. The area is then gently swabbed with hydrogen peroxide to move clotted blood, serum, and debris and is rinsed with warm water.
3. Topical anesthetic may be optionally applied for reduction of patient sensitivity prior to suture removal.
4. A sharp scissors should be used to cut the loops of the individual or continuous sutures. It is often helpful to use the tip of an explorer to gently lift the suture off the tissue prior to cutting.
5. Interrupted sutures need be cut only on the facial aspect close to the tissue.
6. Continuous sutures will require cutting both buccally and lingually.
7. Once the sutures are removed, the area should again be swabbed with hydrogen peroxide or chlorhexidine gluconate to remove any residual debris.
8. The teeth should be polished for complete removal of debris and stain.
9. Plaque control should again be reviewed.

### COMPLICATIONS

The possible complications of suturing are

**1. Wicking effect :** Sutures must lack the wicking effect, which means that sutures must not allow fluids to penetrate the body through them from outside, which could easily cause infections. Monofilament sutures are made of a single strand of material and thus avoids wicking effect.

**2. Stitch abscess :** Abscess that forms due to infection of sutures. It is also known as suture abscess.

**3. Necrosis of the marginal portion of the flap and delayed healing** factors which delay healing includes wound infection, poor blood supply, unsutured open wounds.

**4. Railroad track :** It can be caused by poor repair, excessive tension on tissue, or delay in suture removal. It is also referred to as 'cross hatching' or 'fishbone scars'.

### CONCLUSION

The careful approximation of the tissues is important as it helps in healing as long as there is no tension and a good blood supply. Good scientific knowledge of different sutures and needles, and how they perform, will aid surgeons to achieve optimum wound healing. The art and precise skill of suturing is paramount to the success of all surgical procedures. Thus, sutures have and will play the pivotal role in the field of wound closure, with the new innovations paving ways for better outcomes and minimal tissue & post operative reactions.