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Review of Literature: Socket Shield Technique (SST) a therapeutic approach for better outcomes.

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ABSTRACT:
In modern dentistry, dental implants have increasingly become the preferred solution for tooth replacement due to their durability and aesthetic outcomes. However, one of the significant challenges in implantology is the preservation of alveolar bone post-extraction, particularly the buccal bone, which is prone to resorption. The Socket Shield Technique (SST) presents a groundbreaking approach aimed at preserving the buccal bone and enhancing the aesthetic outcome of dental implants. By maintaining a portion of the tooth root within the alveolar process, SST effectively reduces bundle bone resorption, thereby preserving the natural emergence profile and minimizing the need for additional bone grafting procedures.
Key words: Immediate implant placement, socket shield technique, alveolar bone preservation, improving aesthetics, buccal root retention.

INTRODUCTION:

Dental implants are widely regarded as the gold standard for replacing missing teeth, especially in cases where aesthetics are of utmost importance. The increasing demand for aesthetically pleasing outcomes has shifted the focus towards preserving dental hard and soft tissues during implant placement. In anterior edentulous areas, the resorption of the alveolar ridge post-extraction presents a significant challenge for achieving the desired aesthetic result.

Traditionally, post-extraction bone resorption has been addressed through bone grafting and ridge augmentation procedures. However, these techniques are invasive, costly, and often require multiple surgeries. The SST offers a less invasive alternative by preserving the buccal portion of the tooth root, thereby maintaining the vascular supply to the bundle bone and minimizing bone resorption. This technique, also known as root membrane therapy or partial extraction therapy, has shown promise in achieving optimal aesthetic results, even in challenging clinical scenarios.

Procedure:

The SST involves a meticulous step-by-step approach to ensure the preservation of the buccal bone while allowing for the successful placement of a dental implant.

Step 1:
Tooth Preparation: The procedure begins by reducing the coronal portion of the tooth to the level of the gingival margin. This can be achieved either by trimming the coronal section of the remaining root fragment or cutting the tooth down to the gingival level.

This sectioning can be done by using carbide bur with water coolant at high speed See figure 1

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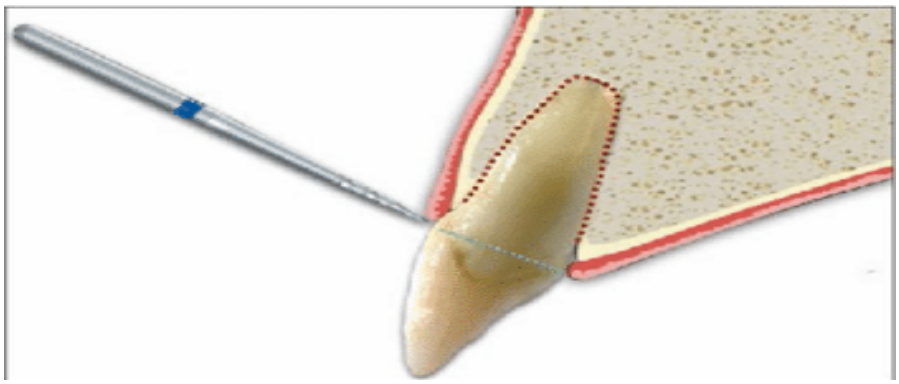


Figure 1: Cut the tooth horizontally at the gingival level.

STEP 2:

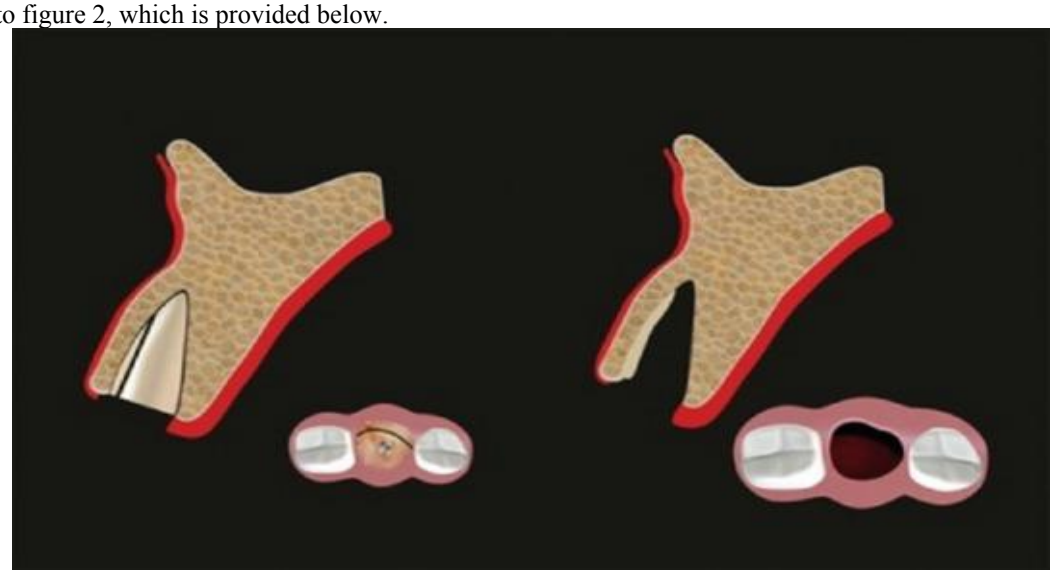
Root Segmentation: Next, the root is sliced vertically, with care taken to preserve the buccal portion attached to the buccal cortical bone.

The palatal half of the root and the apex are then carefully removed.

It is crucial to maintain the shield's length at approximately two-thirds of the original root length.

The buccal portion of the root is then modified to achieve a width of 1.5 to 2 mm, and the shield is trimmed to the level of the bone.

Refer to figure 2, which is provided below.



Step 3: Shield preparation

- The most important step of SST is the shield preparation which ultimately is responsible for maintainence of hard and soft tissue.

-The soft tissue is protected by using gingival retractor tool, it is trimmed to about bone level by using carbide bur at about 1,50,000 to 2,00,000 rpm speed. See figure a.

-The shield is trimmed down till apical third by using round bur. One should see that no root fragment is left behind in the apical area of the buccal root fragment. See figure b.

-The shield should be trimmed in such a way that it should follow the contour of the labia cortical bone.

-The shield should not be in contact with the implant surface (the midfacial portion of shield should be thin).

- The internal aspect of shield is beveled by using diamond bur in such a way that it should form an 'S' shaped shield preparation. See figure c below.

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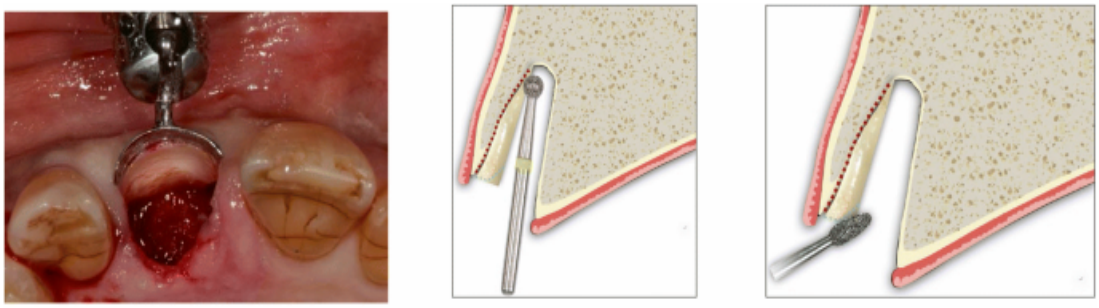


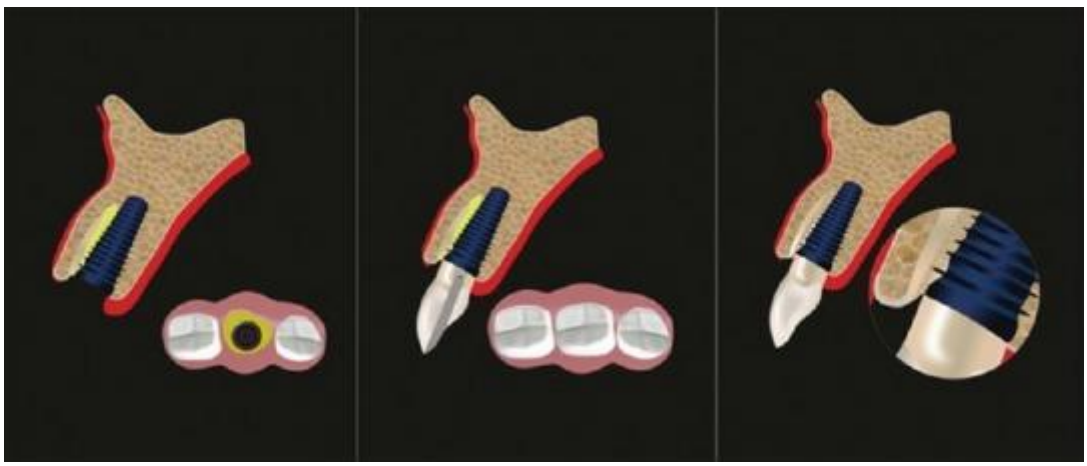
Figure a: Soft tissue protection by using retractor tool. Figure b: Preration of shield along the whole length by using long diamond round bur. Figure c: Bevelling of the internal part of shield to form an S shaped outline.

Step 4: Implant placement

The implant is placed in the optimal three-dimensional (3D) position, ensuring that there is a gap of at least 1.5 mm between the shield and the implant.

If the gap exceeds 3 mm, a bone graft may be required to enhance the outcome.

Customized healing abutments or provisional crowns are used to preserve soft tissue contours and facilitate the final restoration, which can be either screw-retained or cement-retained, depending on the clinical situation.[Figure 3]



Limitations of SST:

Technical Expertise Required: The success of SST heavily depends on the clinician's skill and experience. Precise case selection and surgical technique are critical for achieving favorable outcomes.

Potential for Shield Displacement: During the procedure, if the shield becomes mobile, it must be removed, and a more conventional approach, such as grafting, may be necessary.

Case Selection: SST is not suitable for all patients, particularly those with large periapical lesions, teeth that are not aligned within the arch, or those with significant mobility.

Advantages of SST:

Minimally Invasive: SST is a less invasive procedure compared to traditional bone grafting techniques, reducing patient discomfort and recovery time.

Preservation of Soft and Hard Tissues: By retaining the buccal portion of the root, SST helps preserve the buccal cortical bone and surrounding soft tissues, leading to better aesthetic outcomes.

Reduced Need for Grafting: The technique minimizes the need for additional soft and hard tissue grafts, simplifying the overall treatment process.

Enhanced Aesthetics: SST aids in maintaining the pink and white aesthetic zones, crucial for achieving natural-looking implant restorations.

CONCLUSION:

The Socket Shield Technique represents a significant advancement in the field of oral implantology, offering a promising solution for the preservation of alveolar bone in post-extraction scenarios. As the technique continues to gain popularity among clinicians, its potential to enhance aesthetic outcomes while reducing the need for invasive grafting procedures makes it a valuable addition to modern dental practice. The SST, when applied correctly, can lead to superior aesthetic and functional results, particularly in the anterior region, where aesthetics are a primary concern.

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