

The Socket Shield Technique - A Case Report

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Abstract: *In the aim of achieving an optimal esthetic result, implant dentistry has become an important part of providing prosthesis. The prosthetic and/or surgical parts of the procedure should be performed to reach an optimal outcome. For minimizing the resorption of hard and soft tissue, that exists around the newly extracted tooth socket preservation procedures were introduced, however, in case of ridge deficiencies, hard and soft tissue augmentation procedures are indicated. In this paper, we will present a case report using a new approach in socket ridge preservation, which is the socket shield technique (partial root retention).*

Keywords: Socket shield, Immediate implant, Buccal shield

Abbreviation: SST -Socket shield technique

1. Introduction

The dimension of the residual alveolar ridge changes following an extraction, which has a direct effect on future implant placement and its emergence profile, especially in the anterior region.[1] many techniques were introduced to prevent the resorption of alveolar bone which is caused by trauma during extraction and loss of periodontal ligament. Atraumatic extraction, socket preservation, grafting, and immediate implant placement prevent alveolar resorption and maintaining the dimension by preventing the collapse of cortical plates, but no studies show the complete preservation of alveolar socket. [2]

In 2010, hurzeler et al. introduced a new method, the socket shield technique (SST) to avoid tissue alterations and bone resorption after tooth extraction in which a partial root fragment was retained around an immediately placed implant. It is used as a predictable therapy with minimum surgical intervention, less duration of total treatment, and an optimum esthetic result. [3]

Recent studies also proved that the placement of the implant in contact with the retained root surface preserved the buccal bone and led to a good emergence profile[4]. The principle of SST is to prepare the root of a tooth indicated for extraction in such a way that the buccal /facial root section remains in-situ with its periodontal apparatus intact, vital and undamaged to prevent the expected post-extraction socket resorption.[5]

2. Case

A 50 years healthy male reported to the private clinic in Delhi with a broken upper front tooth. He had a history of trauma due to a fall while riding on a bike. The Patient went for the treatment of upper front teeth in another private clinic where he got treated with root canal treatment and

walking bleach of the same tooth. An attempt to preserve the tooth by root canal treatment failed.

Clinical examination showed grossly decayed root canal treated tooth with healthy gingival and periodontal tissue (Figure 1a and b). After an initial examination, the patient was advised for intraoral periapical radiograph (IOPA) with respect to 21 which revealed root canal treated tooth with the crown margin almost at the crestal bone level. (Figure 2) Before implant placement, a prophylactic protocol for implant placement by Misch was followed which included antibiotic 500 mg amoxicillin 1 h before surgery and rinsing with 0.12% chlorhexidine.[6]

The area to be operated was anesthetized by infiltration block. Tooth 21 was decoronated with a round coarse-grained diamond bur till the crest of the bone and straight diamond bur was used to remove the gutta-percha filling from the root. Sectioning of the root was done in two steps. In the first step, sectioning was done till apical two-third with the help of tapered diamond bur mesiodistally in parallel to the long axis of tooth direction. In the second step, the direction of the bur was changed to detach the buccal fragment from the palatal [Figure 3]. The palatal portion was extracted atraumatically with the help of a Coupland elevator and the remaining buccal fragment was trimmed by leaving only 2 mm as a shield [Figure 3].

The osteotomy was started with a guide drill (Lindemann drill) to get a proper ditch, and then, the sequence of the pilot drill, 2.25 mm drill, 2.8-mm drill, 3.3 mm drill, and 3.7-mm drill was used to enlarge the osteotomy site.

A direction indicator was used after every drill to confirm the direction of osteotomy to the adjacent tooth. CSM submerged implant (Korea) of 4.3-mm diameter and 12-mm length was placed, the primary stability of 35 Ncm was achieved with a hand wrench, and the cover screw was placed [Figures 4 and 5].

The apicocoronal position of the implant platform was situated 1-mm apical to the buccal marginal gingiva. The buccal flap was released till the mucogingival junction to get the buccal advancement of the flap, and the interrupted suture was used to get a proper approximation. Postoperative antibiotics were prescribed and instructions were given, and the patient was recalled after 10 days for suture removal.

No postoperative complication was noticed and healing was uneventful [figure 6]. After 1-week prosthesis (porcelain fused to metal) was delivered (Figures 6 and 7). The patient is under follow-up for the last 6 months. (Figure 8)



Figure 1 (a): Clinical picture



Figure 1 (b): Preoperative clinical picture with broken 21



Figure 2: Preoperative radiograph



Figure 3: Buccal shield intact



Figure 4: Abutment placed



Figure 5: Composite buildup around abutment



Figure 6: Postoperative clinical picture with prosthesis

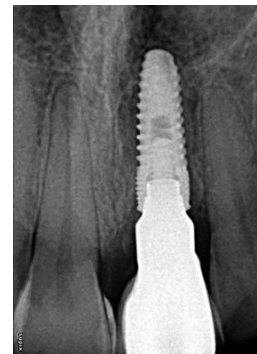


Figure 7: Postoperative radiograph



Figure 8: Follow up after 3 month

3. Discussion

Various recent studies have confirmed that the socket shield technique has the potential to reduce bone resorption after removal of tooth followed by immediate implantation,

mainly through the retention of the buccal segment of the root (hurzeler et al., 2010) but everyone had a different loading protocol and follow-up duration.

It is a simple economical technique that can be carried out with minimal surgical intervention. The socket shield technique allowed us to preserve the thin and prone buccal bone to resorption at the proposed implant site.

In this case report, the socket-shield technique was used in an area where the buccal cortical plate was thin by keeping the root fragment attached to the buccal bone and placement of immediate implant maintaining the ridge contour. The results were inconsistent with the original technique given by hürzeler et al[3]. No postoperative complication was seen and healing was uneventful.

Krumph and Barnet showed a high success rate of immediate implant placement, and it has many advantages over the delayed loading. First, it reduces the time for a final prosthesis [7] second-stage surgery and extraction socket and provide the proper angulation for the direction of the implant and reduce the chance for the angulated abutment. In this case, the primary stability of 35 Ncm was achieved by extending the osteotomy 3 mm beyond the extraction socket.[8]

According to Botticelli, if the distance between the implant surface and the socket wall is 0.5–1 mm, there is no need for a bone graft to fill the space, but if space is more than 1 mm, grafting is indicated.[9] In our case, a bone graft was not required.

4. Conclusion

This present case report of immediate implant placement with socket-shield technique shows successful preservation of postextraction tissue and thin buccal bone with the successful restoration of the implant. The Socket-shield technique shows the promising result in the preservation of the postextraction socket, dimension of the residual alveolar ridge and holds significant value in implant and esthetic dentistry. Further studies are required to find out the long-term success rate of this technique.

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