

# ROLE OF SOCKET SHIELD TECHNIQUE IN IMMEDIATE IMPLANTS PLACED IN THE ESTHETIC ZONE – A CASE REPORT

<sup>[1]</sup> M. Dr.G.Ulaganathan,<sup>[2]</sup> Dr.Thanvir Mohamed Niazi,<sup>[3]</sup> Dr.Catherine Diana,<sup>[4]</sup> Dr.Senthil Moorthy,<sup>[5]</sup>  
Dr.S.Seetha,<sup>[6]</sup> Dr.Ganesh Mitun  
<sup>[1]</sup> MDS, Professor,<sup>[2][3][4][5][6]</sup> MDS, Professor And HOD, Oral And Maxillofacial Surgeon  
<sup>[1][2][3][4][5][6]</sup>CSI College Of Dental Sciences And Research, Madurai

## ABSTRACT

Immediate implant is a valuable treatment of choice to replace non restorable teeth in the esthetic zone with a success rate of 87.5 to 100%. It has several advantages like minimizing the total treatment time, cost effective, and psychosocial benefits. In spite of the exceptional success rates, horizontal buccal bone resorption of about 56% and corresponding palatal bone resorption of 30% has been documented with respect to immediate implants (1). These morphometric changes negatively influence the aesthetic outcome of dental implants. The use of modified surgical procedures such as the flapless technique, various hard tissue augmentation procedures, guided bone regeneration (GBR) and titanium reinforced barriers as well as various bone promoting molecules have been tried for bone preservation, with each method having its own benefits and drawbacks. Recently socket-shield technique (SST) otherwise called partial extraction therapy by Hurzeler et al in 2006 was described where buccal segment of the root is retained as a shield in situ, which aids in preserving periodontal attachment apparatus thus preserving the vascularity of buccal bone when compared to other conventional techniques. Here we present a case of non-restorable tooth in the maxillary aesthetic zone managed with placement of immediate implant using socket shield technique and evaluating the hard tissue health and aesthetic outcome (2).

## INTRODUCTION

Extraction of a tooth with immediate implant placement was found to result in loss of buccal bone, both vertically and horizontally and flattening of the interproximal bone. This presents a very challenging situation to a clinician in restoring the missing tooth with an acceptable esthetics, especially in the maxillary anterior region. The use of modified surgical procedures such as the flapless technique, various hard tissue augmentation procedures, guided bone regeneration (GBR) and titanium reinforced barriers as well as various bone promoting molecules have been tried for bone preservation, with each method having its own benefits and drawbacks. On the other hand, the socket-shield technique (SST) by Hurzeler et al. is a new method where a buccal segment of the root is retained as a shield, which aids in retaining

periodontal ligament on buccofacial aspect and immediate implant placed lingual to this shield. Restoration of hard and soft tissues around the tooth are essential to create a more natural like appearance. Therefore, socket shield technique is emerging as a predictable therapy with minimum surgical intervention, less duration of total treatment and an optimum esthetic outcome. Also intentional retention of a section of the remnant buccal aspect of the root does not appear to interfere with osseointegration(2).

## SYNONYM

Partial extraction therapy, Root membrane technique and Partial root retention therapy. The principle of socket shield technique is as follows Tooth indicated for extraction is prepared as socket shield (remains in situ) with its intact physiological relation to the buccal bone. And the periodontium of the tooth

root remain vital and undamaged to prevent the post extraction socket remodelling also the shield supports the buccal/facial tissues, thereby preventing the recession of tissues buccofacial to an immediately placed implant. Here we report a case of immediate implant placement using socket shield technique (3).

## CASE REPORT

A 32 year old male patient reported to the department of oral and maxillofacial surgery with a chief complaint of broken tooth in the left upper lateral incisor and wanted to replace the tooth( figure 1). Patients medical history was not significant and the patient is apparently healthy, No relevant family history . Extraction of the root stumps with socket shield technique followed by immediate implant was planned under local anaesthesia in relation to 21 and consent was obtained after explaining the procedure in detail to the patient . Preoperative CBCT is taken for implant site assessment and routine blood investigations were done including RT-PCR test. Following administration of local anaesthesia, the tooth was sectioned at the gingival level and then divided into buccal and palatal parts using Lindemann bur with the intention to preserve the bucco-facial aspect of the retained tooth root . Followed by extraction of the palatal part of the root without traumatizing the buccal root section . Using lindemann and round bur (large and small) the buccal part of the root is prepared both in apico-coronal and in mesio-distal direction and the height of the buccal socket shield was reduced to the level of bone so that the crestal part of the root fragment descends 3mm below the tip of the gingival(Figure 2) . The extraction socket was then curettaged to remove any granulation tissue and the buccal root shield was checked for immobility using a sharp probe. The remaining intact prepared portion of the tooth is called the socket shield or root membrane. The routine implant placement procedure was done as per the drilling sequence suggested by the implant manufacturer. Using pilot drill implant of 3.75 × 13mm size was placed into the palatal aspect of the socket in relation to upper left central incisors without disturbing the buccal root segment , healing cap was placed, haemostasis achieved followed by primary closure was done using 3.0 true silk, post operative instructions to be followed were educated to the patient , antibiotics and analgesics were prescribed for 5 days post operatively. Satisfactory wound healing were observed and suture removal is done

in one week . Followed up for next 6 months after the delivery of the prosthesis and clinical data were collected as per following parameters: Photometric analysis using Pink aesthetic scale, Bleeding on probing, Periodontal probing depth and Bone height and width around implant. After 3 months of complete osseointegration porcelain fused metal crown was delivered to the patient (Figure 3).

## DISCUSSION

Daniel Baumer et al in 2017 analysed the safety of the technique with regard to biological and implant-related long-term complications and to observe the clinical appearance of the peri-implant tissues and evaluated volumetric changes of the affected facial contours and the aesthetic outcome in long-term. The comparison of radiographic images showed physiologic bone remodelling at the implant shoulders. Mean tissue loss on the facial side in orofacial direction was 0.2-0.18 mm. Average recession at implant was 0.3-0.23 mm. Mean loss of the marginal bone level at the implant shoulder amounted to 0.33-0.43 mm at the mesial and 0.17-0.36 mm at the distal aspect of the implants. Mean pink aesthetic score of 12 was recorded and suggested this technique should not be used in routine clinical practice until a higher level evidence in the form of prospective clinical trials is available (4). Payal Rajender Kumar et al in 2018 Proposed a classification system of SST technique depending on the position of the shield in the socket. Type I: Buccal shield, Type II: Full C buccal shield, Type III: Half C buccal shield, Type IV: Interproximal shield , Type V: Lingual-palatal shield and Type VI: Multiple buccal shields (5). . Abadzhiev M et al in 2014 and Baumer D ,et al in 2017 in a case control study showed medium vertical bone loss of 0.8 mm was reported in 26 implants on 25 patients after 24 months of follow up (6). . Troiano M et al in 2014 in a prospective clinical case series showed the marginal bone loss was reported to be 0.7 mm on an average after 6 months .in a retrospective study on 10 patients in 2017 , a mean bone loss of 0.33 mm in mesial and 0.17mm in distal were reported (7). In recent systematic review the authors found an horizontal bone loss of 1.07 mm and vertical bone loss of 0.78 mm after immediate placement of implant .Usually this horizontal bone loss has to be compensated by bone augmentation or connective tissue graft. Although the amount of marginal bone loss in the socket shield technique is still not conclusively proved , current clinical experiences seen to point

a minimal, negligible and even nonexistent bone loss after extraction. As a consequence of this, soft tissue grafting could not be necessary in most of the patients treated with this technique. Histological studies of Hurzeler showed the cementogenesis between the implant surface and the retained root surface and clinically successful osseointegration of implant. Manjunath mundoor dayakar et al., in 2018 compared socket shield technique with immediate implant placement showed successful preservation of post extraction tissue and showed promising result in preservation of post extraction socket and holds significant value in implant and in aesthetic dentistry. Hence this minimally invasive socket shield technique ensures preservation of peri-implant tissues, helps to maintain aesthetics, guides in placing implants in correct position and presents as a viable treatment. Still there is insufficient evidence to support the socket shield technique with simultaneous implantation due to lack of data available with its biological long term complication that may occur especially in the presence of pre-existing or developing periodontal or endodontic infections or inflammations of the retained root fragments. Only a few case reports are available showing variable data of bone loss (8).

## CONCLUSION

In the present case report of immediate implant placement with socket shield technique shows successful preservation of post extraction tissue and thin buccal bone with successful restoration of the implant. Socket shield technique shows promising result in the preservation of post extraction socket and holds significant value in implant and aesthetic dentistry, further prospective clinical studies are required to find out the long term success rate of this technique.

## REFERENCES

1. Diana C et al., Does platelet-rich fibrin have a role in osseointegration of immediate implants? A randomized, single-blind, controlled clinical trial. *Int J Oral Maxillofac Surg.* 2018 Sep;47(9):1178-1188. doi: 10.1016/j.ijom.2018.01.001. Epub 2018 May 7. PMID: 29402513.
2. Blaschke, C., Schwass, D.R. The socket-shield technique: a critical literature review. *Int J Implant Dent* 6, 52 (2020). <https://doi.org/10.1186/s40729-020-00246-2>.
3. Arabbi, Kashinath C et al. "Socket Shield: A Case Report." *Journal of pharmacy & bioallied sciences* vol. 11, Suppl 1 (2019): S72-S75. doi:10.4103/jpbs.JPBS\_228\_18
4. Daniel baumer et al, *Clin oral implants Res.*2017,nov socket shield technique for immediate implant placement-clinical,radiographic and volumetric data after 5 years.
5. Kumar, Payal Rajender, and Udatta Kher. "Shield the socket: Procedure, case report and classification." *Journal of Indian Society of Periodontology* vol. 22,3 (2018): 266-272. doi:10.4103/jisp.jisp\_78\_18
6. Abadzhev M, Nenkov P, Velcheva P. Conventional immediate implant placement and immediate placement with socket-shield technique—which is better. *Int J Clin Med.* 2014;1:176–80.
7. Troiano M, Benincasa M, Sanchez P, Guirado J. Bundle bone preservation with Root-T-Belt: case study. *Ann Oral Maxillofac Surg.* 2014;2:7–2.
8. Dayakar MM, Waheed A, Bhat HS, Gurrur PP. The socket-shield technique and immediate implant placement. *J Indian Soc Periodontol.* 2018 Sep-Oct;22(5):451-455. doi: 10.4103/jisp.jisp\_240\_18. PMID: 30210197; PMCID: PMC6128121.



Figure 1:PREOPERATIVE



Figure 2: SOCKET SHIELD PREPARATION



Figure 3: FINAL PROSTESIS DELIVERED