Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Indian Citation Index (ICI) Index Copernicus value = 91.86

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Case Report

Immediate implant placement with immediate loading in anterior region with a socket shield technique

[1]K. Swetha, [2]Soumya Paruchuri, [3]Krishnaveni Jampala, [4]Nishitha Goli, [5]Apurva Reddy Kanathala, [6]Manaswini Draksharapu

[1,2]BDS, MDS, Department of Prosthodontics, Kamineni Institute of Dental Sciences, Telangana, India;
[3]BDS, Government Dental College and Hospital, Hyderabad, Telangana, India;
[4]BDS, SVS Institute of Dental Sciences, Mahabubnagar, Telangana, India;
[5]BDS, Kamineni Institute of Dental Sciences, Telangana, India;
[6]BDS, MDS, Department Of Prosthodontics, Mamata Dental College, Khammam, Telangana, India

ABSTRACT:
Extraction of teeth causes a cascade of events, including unsupported buccal plate bone, decreased blood flow, and resorption due to the thinness of the plate. To avoid this sequence and generate a natural emerging profile around dental implant prostheses, a variety of procedures were tested. For this, a new creative technique called as socket preservation operations was created, in which the root was bisected and the buccal two-thirds of the root was maintained in the socket, preserving the periodontium, bundle bone, and buccal bone. In addition, depending on the position of the shield in the socket, classification for SST approach is suggested. This classification aids in better understanding of the preparatory design and the role of the shield, as well as maximising the shield's use in immediate implant insertion locations to obtain the best potential aesthetics. Socket Shield is the subject of this article.
Keyword: Implant, socket shield, emergence profile, buccal bone

Received: 07 July, 2022 Accepted: 11 August, 2022

Corresponding author: K. Swetha, BDS, MDS, Department of Prosthodontics, Kamineni Institute of Dental Sciences, Telangana, India

This article may be cited as: Swetha K, Paruchuri S, Jampala K, Goli N, Kanathala AR, Draksharapu M. Immediate implant placement with immediate loading in anterior region with a socket shield technique. J Adv Med Dent Scie Res 2022;10(9):15-19.

INTRODUCTION

One of the main objectives of prosthetic rehabilitation is to develop and maintain a balance between the pink and white zones, particularly in the cosmetic sections. Following atraumatic excision of a tooth with immediate implant implantation, loss of buccal bone occurred both vertically and horizontally, as well as flattening of the interproximal bony scallop, resulting in a complex rehabilitation. Hürzeler et al. were the first to introduce and describe the socket-shield technique (SST).[1]When extracting a tooth, the method involves leaving a root fragment, notably the vestibular region of the root's most coronal third. A dimensional alteration of the ridge occurs after the extraction of a tooth, as is well documented. Partial extraction therapy, root membrane technique, and partial root retention are all terms used to describe this technique. Unattractive black triangles form between teeth as a result of bone loss, followed by apical migration of soft tissues. This provides an extremely difficult issue for a doctor in terms of recovering the lost tooth while maintaining acceptable aesthetics, particularly in the anterior region. In order to compensate for this loss, many preventive operations such as ridge preservation techniques and post-ridge collapse procedures such as bone augmentation, soft-tissue augmentation, or a combination of these have been employed in the past. [2]The SST is a predictable therapy with less surgical involvement, a shorter total treatment time, and the best possible cosmetic result. Because the periodontal ligament remains linked to the dentine and cement of the root fragment, the SST aims to compensate for the loss of vestibular volume by "misleading" the bundle bone.

The principle of socket-shield technique (**SST**) **is as follows**:[3]

1. Preparation of the root of a tooth indicated for extraction in such manner that the buccal/facial

root section remains in situ with its physiologic relation to the buccal plate intact.
2. The tooth root section's periodontal attachment apparatus (periodontal ligament, attachment fibers, vascularization, root cementum, bundle bone, and alveolar bone) remain vital and undamaged to prevent the expected post-extraction socket remodeling and to support the buccal/facial tissues.
3. The prepared tooth root section acts as a SS and prevents the recession of tissues buccofacial to an immediately placed implant.

CASE REPORT

A 28-year-old man reported to the department of prosthodontic, crown and bridge and implantology with the chief complaint of loose pin and cap in upper front teeth region and wanted to get it replaced. Extraction of the root stumps using SST inorder to improve emergence profile and rehabilitation, by placing implants in the region of 11 was planned. No relevant medical history was found. Figure 1 shows preoperative clinical picture and IOPA OF 11.

Fig 1: Pre-op photographs and radiographs

TECHNIQUE FOR SST

The following are the steps of the SST for instant implant placement

Step1: Cut the crown horizontally at the gingival level in step one.

Step2: Vertically bisect the root so that the palatal half and apex are both removed using long shank root resection diamond bur –for an oblique cut 9 (fig 2 and 3). The shield's length should be two-thirds of the root's length. This phase needs a significant amount of practise, patience, and time. The buccal section of the shield is then sculpted to a width of 1.5–2 mm. The shield should be cut down to the level of the bone. The inside side of the shield has a bevel or S-shaped design to accommodate the restorative components. (fig 4)

Fig 2: Long shank root resection diamond bur –for an oblique cut

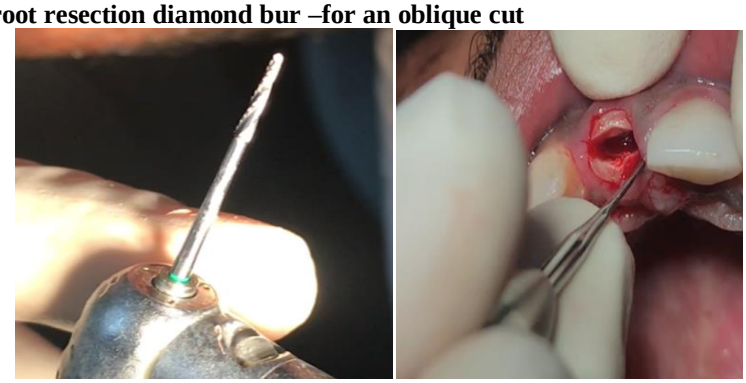
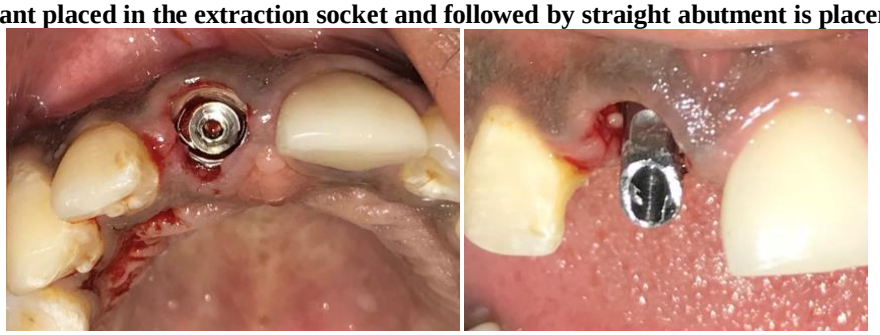


Fig 3: Atraumatic Palatal root extractionusing root forceps

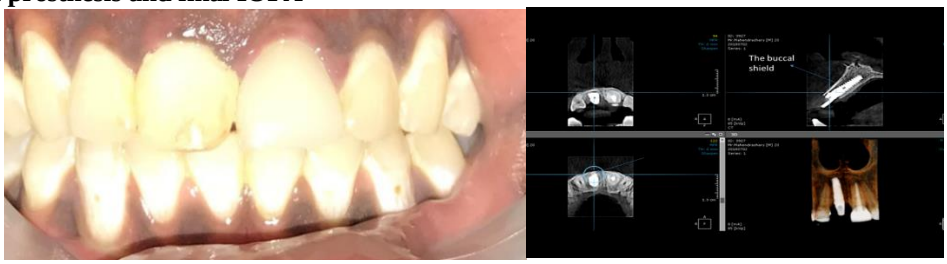
Fig 4: Buccal root wall retained

Fig 5: An implant placed in the extraction socket and followed by straight abutment is placement



Step 3: Implant is placed in the proper three-dimensional (3D) position. The ideal distance between the shield and the implant is 1.5 millimetres or more. If the gap is greater than 3 mm, a bone graft is recommended. The soft-tissue contours will be preserved with the use of a provisional crown or a tailored healing abutment placed immediately after the implant insertion.(fig 5)A screw-retained crown or a cement-retained crown with restorative margin that can be easily accessed for cement clean up are the prosthetic options for the ultimate restoration.(fig 6)

Fig 6: **Final prosthesis and final IOPA**



DISCUSSIONS

Various root retention hypotheses have been proposed and clinically evaluated in order to avoid tissue alteration and reduce the impact of tooth removal on the resorption process.

CLASSIFICATION

TYPE I: Buccal shield ((the shield lies only in buccal part of the socket, between proximal line angles of tooth)

Single edentulous site with both mesial and distal teeth present is an indication.

Type II: Full C buccal shield Indication: 1. An implant already exists on either side of the desired site. 2. Missing tooth on either side of the mouth that cannot be replaced by an implant. 3. One side of the mouth has an implant while the other side has a missing tooth.

Type III: Half buccal shield Indication: when one side has a tooth and the other has an implant or a missing tooth.

Type IV: Interproximal shield Indication: when buccal bone loss necessitates grafting and there is a lost tooth or implant on the neighbouring side.

Type V: Maxillary molars are indicated Palatal shield.

Type VI: Multiple buccal shields: when there are two or more shields in the socket, this is an indication. It's used when there's a vertical root fracture. There is evidence of bone deposition between shattered roots, which may help to keep the two fragments together. The following classification is a theory that has to be proven by clinical research to establish the safety as well as the assertions that bone height and papilla would be preserved when such alterations to the original approach are used.[4]

Salama and colleagues demonstrated the Root Submerge Technique (RST), which protected the

natural periodontium and prevented bone resorption. On the third and fourth mandibular premolars of beagle dogs, Hürzeler et al. proposed a new approach, the socket shield technique, in 2010. He employed coarse-grained diamond bur to decoronate the distal end of the premolar and kept a partial root fragment around an instantly inserted implant to minimise tissue changes after tooth extraction. Clinical case demonstrated good buccal tissue preservation and clinically successful osseointegration after a 4-month Histological investigation revealed no resorption of the root fragment and fresh cementum formed on the implant surface. If the implant is placed in touch with this natural tooth fragment, he concluded that leaving the coronal buccal root piece intact helps to assure the physiological maintenance of labial and buccal bone components. However, these methods come with some hazards, including as the creation of a pre-implant periodontal membrane and pre-implant infection. These arise when the retained tooth fragment has pre-existing or developing periodontal or endodontic infections or inflammations.[5] Filippi, et al. shown that de-coronation of an ankylosed tooth protected the alveolar bone before implant insertion by keeping the root of living or pulpless teeth to avoid tissue alteration and the consequences of tooth extraction. Malmgren, et al., 13,14,15 Malmgren and his colleagues Andersson, et al. offer research that shows that preserving decoronated roots in the alveolar process not only preserves existing bone volume but also allows for vertical bone growth, which can be seen coronally to the decoronated root. A study that showed that regeneration is possible! Bjorn took 6 photos of alveolar bone around endodontically treated teeth. In his work, O'Neal et al. found that a new cementum and connective tissue forms across the coronal surface of submerged roots, separating the dentine from new bone. By leaving the de-crowned root fragments,[6]Von Arx et al. published a method to preserve the alveolar ridge. Over a two-year follow-up period, Davarpanah&Szmukler reported a case study of five patients indicating that immediately implanted implants with direct implant contact with ankylosed tooth fragments were retained without any symptoms of pathological alterations. The root was hemisected using a fissure bur in a mesiodistal direction, then the lingual fragment (atraumatic) of the root was removed, then the buccal fragment was reduced using a surgical bur, leaving thin layer of the root aspect intact to the buccal plate of the bone, according to case report presented by Al-Dary H.[7]

The author used one-piece implant in this study because Hermann et al. found that two-piece implants have significantly more crestal bone loss than one-piece implants, resulting in a significantly more apical gingival margin. Also, the degree of inflammation in peri-implant tissues is lower around one-piece implants than two-piece implants. After five-month delay, he determined that maintaining the buccal portion of the root in conjunction with rapid implant insertion is viable strategy for achieving three-dimensional implant placing, which necessitates adequate support and stability of the surrounding hard and soft tissues. .A bone trephine was utilised to remove the remaining root in another case report by the same author, leaving an organised rounded section of the palatal/lingual extraction site with semi lunar interior shape of the buccal aspect of the root that would receive an implant. He came to the conclusion that employing trephine to prepare the shield would be far superior to utilising a pressure bur.

THIS PROCEDURE'S BENEFITS AND LIMITATIONS

Minimally invasive surgical procedure that helps retain hard and soft tissue shapes by conserving a portion of the root. It reduces the requirement for soft and hard tissue grafting procedures, resulting in a shorter treatment time. By preparing an interdental socket shield, the interdental papilla can be retained even in cases with neighbouring implants. It aids in the preservation of pink and white aesthetics. Also gives an appealing option for cases with a high lip line or maxillary anteriors. This procedure not only preserves but also aids in the maintenance of the hard and soft tissues.

CONCLUSION

Before the treatment may be routinely prescribed, practitioners must add to the knowledge base and contribute to the long-term success of the implant in the aesthetics zone. Although the socket shield technique is cost-effective, it is still technique-dependent, and success necessitates a unique case selection to obtain desired results. Furthermore, when performing immediate implant placement, adequate surgical therapy, restorative techniques, and clinical experience are required. SST is becoming increasingly popular among therapists around the world. In circumstances of immediate implant placement after extraction, the approach has a lot of promise for the preservation of hard and soft tissues. Clinicians will be able to obtain the shield based on the clinical circumstance and achieve the best potential cosmetic results, even in urgent implant cases, thanks to the proposed classification.

REFERENCES

1. Kumar PR, Kher U. Shield the socket: Procedure, case report and classification. Journal of Indian Society of Periodontology. 2018 May;22(3):266.
2. Esteve-Pardo G, Esteve-Colomina L. Clinical application of the socket-shield concept in multiple anterior teeth. Case reports in dentistry. 2018 Jun 20;2018.
3. Arabbi KC, Sharanappa M, Priya Y, Shah TD, Subbaiah SK. Socket shield: a case report. Journal of Pharmacy &Bioallied Sciences. 2019 Feb;11(Suppl 1):S72.

4. Shalimon A, Ravichandran R, Kumar H, Nair VV. Socket shielding concept in implant Placement: A neoteric approach.
5. Hürzeler MB, Zuhr O, Schupbach P, Rebele SF, Emmanouilidis N, Fickl S. The socket-shield technique: a proof-of-principle report. Journal of clinical periodontology. 2010 Sep;37(9):855-62.
6. Lin S, Schwarz-Arad D, Ashkenazi M. Alveolar bone width preservation after decoronation of ankylosed anterior incisors. Journal of Endodontics. 2013 Dec 1;39(12):1542-4.
7. Davarpanah M, Szmukler-Moncler S. Unconventional implant treatment: I. Implant placement in contact with ankylosed root fragments. A series of five case reports. Clinical oral implants research. 2009 Aug;20(8):851-6.