

Prosthetic Rehabilitation of Maxillary Anterior Region Using Socket Shield Technique Followed By Immediate Implant Placement: A Case Report

¹Lt Col Lalit Janjani, Dental Officer and Classified Specialist (Oral and Maxillofacial Surgery), Military Dental Centre, Roorkee, Uttarakhand, India

²Maj Reshma Raju, Dental Officer (Prosthodontics), Military Dental Centre, Roorkee, Uttarakhand, India

Corresponding Author Maj Reshma Raju, Dental Officer (Prosthodontics), Military Dental Centre, Roorkee, Uttarakhand, India

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Abstract

Socket shield technique (SST) is the retention of buccal aspect of the root followed by implant placement. This technique is effective in preserving the alveolar ridge contour, reduce its resorption and improve peri-implant stability. It helps in enhancing the aesthetic results of rehabilitation by maintaining the integrity of the bundle bone complex even when the buccal bone is less than 1mm. Preserving the periodontal ligament and the supra-crestal attachment of the tooth through socket shield technique have the potential to avoid buccal bone remodelling. This case report describes the prosthetic rehabilitation of a patient who had reported with a fractured maxillary central incisor, using Socket shield technique followed by immediate implant placement. Chair-side provisional restoration fabricated using Bisacryl composite was delivered to achieve optimal esthetic and functional treatment outcomes.

Keywords: Socket shield technique, Immediate implantation, peri implant modifications.

Introduction

Implant based rehabilitation is considered a reliable treatment to replace missing teeth, and has a long-term prognosis according to several qualitative and quantitative research. These treatments may be clinically challenging, as optimal treatment outcomes depends on successful prosthetic rehabilitation, preservation of soft tissues and patient satisfaction.¹

Dental extractions and loss of teeth can cause volumetric changes in bone tissues characterized by the resorption of alveolar bone, especially the buccal bone wall, with a consequent retraction of the related soft tissues.² This can be attributable to the loss of periodontal ligament and vascular support at the extraction site. Trauma at the buccal bone plate and alveolar bone alterations such as fenestration and dehiscence can also result in a thin

buccal cortical plate. Such physiological processes interfere with optimal implant positioning and hamper the achievement of good emergence profile in implant-supported prostheses, especially in the anterior region. Therefore, it is mandatory to preserve the alveolar bone, obtain soft tissue emergence profile and maintain the periodontal architecture.³

Different techniques such as immediate implant, augmentation procedures, platform switching concepts, and various socket preservation techniques, such as “immediate dentoalveolar restoration” or the “ice cream cone” technique, have been investigated in the literature. In clinical studies that evaluated the quality of life, immediate implant placement is the preferred alternative because of shortened treatment time, immediate esthetic improvement, reduction of morbidity and fewer surgical interventions.¹

The socket shield technique (SST) introduced by Hurzeler et al. (2010) is a partial extraction therapy which consists of retaining the buccal aspect of the root in conjunction with immediate implant placement. Studies have shown that this procedure prevents buccal bone resorption, marginal bone loss and helps achieve higher pink esthetic scores.⁴ This case report describes prosthetic rehabilitation of a patient with fractured fixed partial denture in the maxillary anterior region using the socket shield technique followed by immediate implant placement and fabrication of chairside provisional restoration.

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socket shield technique followed by immediate implant placement and fabrication of chairside provisional restoration.

Case Report

A 41-year-old male patient reported to the dental OPD with a chief complaint of ill-fitting fixed partial denture (FPD) in the upper front teeth region for two weeks. The patient was apparently normal until he began experiencing food lodgement and looseness of fixed denture. The patient had undergone root canal treatment followed by post and core due to fracture of the upper teeth following a road traffic accident before four years. The teeth were rehabilitated with joint crowns fabricated out of porcelain fused to metal.

Intraoral examination revealed dislodged FPD in Tooth no 21 and 22 [Figure 1] with fractured metal screwed post and core. Radiovisio-graphy revealed root canal treated teeth with underobtured canals [Figure 2]. The crowns were fractured enmasse at the cemento-enamel junction of 21 and 22. Tooth no 22 had the fractured fragment of the metal post within the root canal and periapical radiolucency with ill-defined borders, indicating periapical pathology. Soft tissue examination showed a low lip line and a medium gingival phenotype. The oral hygiene status of the patient was good. The medical history was non-contributory.

Cone Beam Computed Tomography (CBCT) [Figure 3] showed a bone density of 794 Hounsfield Units (HU), 13.5 mm from the alveolar crest to the nasal floor, 8.0 mm from the root tip to the nasal floor, and a buccal-lingual width of 5.2 mm. The buccal cortical plate was thin. Based on these findings, socket shield technique followed by immediate implantation of tooth no 21 was planned. Tooth no 22 had poor prognosis and was planned for extraction. The treatment plan was explained to the patient and consent was obtained.

The treatment was carried out under standard operative protocol. The patient was given 0.12% chlorhexidine as a pre procedural rinse. Local anaesthetic was administered using local infiltration of 2% Lidocaine with 1:80000 Adrenaline. Tooth no 22 was extracted and primary haemostasis was achieved followed by simple interrupted sutures with black silk suture material.

Root canal length of tooth no 21 was assessed from the CBCT. The gutta percha was removed using an endodontic H file (#40) and confirmed using RVG. A long shank tapered diamond bur was used to separate the root mesiodistally. The palatal root section was luxated carefully and extracted without any damage to the buccal root section [Figure 4, 5]. The shield thickness was reduced to 1.2 mm. Then, it was bevelled just below the base of the gingival sulcus and finished using a large diamond round bur. An osteotomy was performed palatally to the shield of the partially extracted tooth (speed 1000 rpm, torque 40 Ncm) using a 2 mm pilot drill, followed by subsequent drills to prepare for implant placement. The implant bed was enlarged to reach a diameter of 3 mm. Then, a 3.5 mm wide and 11.5 mm long Refirm implant (Intessence Solutions Pvt Ltd, Bengaluru, India) was inserted 1 mm sub crestal (from the palatal alveolar crest), about 1.5 mm below the shield, leaving a 1 mm gap between the implant and the shield [Figure 6]. The insertion torque was maintained at 25 Ncm. The implant's contact with the surrounding mesial, distal, and palatal bone walls was verified, and its stability was measured using a torque wrench (35 Ncm). Due to adequate initial stability, chairside provisionalisation (3M ESPE Protemp 4 Temporisation material refill shade A2, 3M India Ltd, Bengaluru, India) was performed.

A straight abutment (dia 3.5 mm) was tried, adjusted to the occlusal height, and attached to the implant. A screw-

retained provisional crown was fabricated chairside using bis acrylic composite restorative material. The tissue surface was crafted in 'S' shape ie concave subgingivally to help with soft tissue remodelling. An ovate pontic was cantilevered along with the provisional crown for replacement of tooth no 22. The occlusion was adjusted to ensure non-functional loading. Articulating film (12 µ) (Dr Jean Bausch GmbH & Co, Germany) was used to ensure non-contact of the occluding surfaces [Figure 7]. The contact areas, embrasure and tissue surfaces of the prosthesis were carefully inspected to ensure their self-cleansing capability. Postoperative care instructions included the continuation of antibiotics, NSAIDs, and chlorhexidine mouthwash. Post operative follow-up visits at one day, one week and one intervals showed uneventful healing with good emergence profile and patient satisfaction. Radiographic evaluation also revealed well osseointegrated implant with no abnormalities.

The patient was recalled five months after the Stage 1 surgery. CBCT revealed new bone tissue in the interval between the root segment and implant. Clinically the gingival architecture was well preserved indicating stable health condition of the peri-implant tissue.

The provisional prosthesis was removed, straight abutment was tried and adjusted for adequate clearance for the fabrication of definitive prosthesis. A rest seat of mm width and mm depth was prepared on the palatal surface of tooth no 23. The palatal rest helps in enhancing stability and retention of the prosthesis. The cement retained implant supported prosthesis in relation to tooth no 21 with cantilever on tooth no 22 and a palatal rest on tooth no 23 was fabricated using porcelain-fused-to-metal. The abutment was torqued to 35 Ncm and the screw access channel was obturated using PTFE tape (Teflon tape). The prosthesis was

checked for occlusion and then luted using dual curing resin based luting cement (Fusion Ultra D/C, Prevest DenPro Ltd, Industrial Park Bari Brahmna, Jammu & Kashmir, India). [Figure 8].

Discussion

Socket Shield Technique followed by immediate implantation in the maxillary esthetic region is the most sought-after procedure in the recent times. This procedure is very challenging as the results are affected by the placement timing, topography of the alveolar socket, soft and hard tissue dimensions, surgeon skill level, implant position and design, and demands extreme precision due to patients' high long-term requirements. SST was chosen for this patient as careful pre operative assessment and patient counselling met the criteria for optimal treatment outcomes.⁴⁻⁵

Gluckman et al. (2016) reported a reduction in buccal bone resorption in SST-treated patients over a three-year follow-up period, with over 95% of implants achieving successful integration and maintaining stable peri-implant tissue health.⁶ This is in corroboration of the randomized controlled trial by Venkatraman et al. (2023).⁷

According to the meta-analysis carried out by Lee et al., bone dimensions around the immediate implant show a reduction of approximately 0.5–1.0 mm on the vertical and horizontal facets, at 4–12 months after surgery.⁸ In this case report, a 4-month follow up revealed well preserved marginal bone height and peri-implant soft tissue. The patient has been scheduled under regular follow-up visits to ensure successful post treatment results.

While the SST has significant advantages, it has its limitations. One of the primary challenges is the high level of technical skill required for the meticulous preparation of the buccal shield, to prevent complications

such as shield mobility, exposure, or fracture, soft tissue recession and peri-implantitis. A case report by Godil et al. (2022) discussed an SST-associated complication in a patient with a thin gingival biotype that resulted in soft-tissue recession and shield exposure. The authors emphasized the importance of careful patient selection and suggested that performing a connective tissue graft at the time of implant placement can minimize or eliminate potential soft-tissue complications in these situations.⁹ Another limitation is the lack of robust, long-term data assessing SST outcomes beyond five years. A systematic review by Alhachache et al. (2022) emphasized the necessity for additional long-term studies that assess the SST's efficacy and prognosis.¹⁰ Recent studies have observed that SST provides similar results for the posterior area and in the mandibular arch too.

Conclusion

This case report of immediate implant placement using the socket shield technique demonstrates how an immediate implant can be successfully restored by maintaining both the peri-implant hard and soft tissue architecture. The biological concept of the socket shield may appear to be efficient in preserving the peri implant hard tissue dimensions, but long-term results remain scarce, and well-designed clinical studies with long-term follow-up are required in addition to the requirement of highly technique-sensitive skill by the clinician.

References

1. Altalhi A M, AlHajji H H, Alharbi S K, Alanzi AR, Baslom ZM, Omar JA et al Socket Shield Technique in Implant Dentistry: A systematic review and meta-analysis of survival, aesthetic outcomes, and complications *Cureus* 2025;17(6): e85176
2. Bohórquez PV, Rucco R, Macho AZ, María J, Buró SV. Failure rate, marginal bone loss, and pink esthetic with socket-shield technique for immediate dental implant placement in the esthetic zone. a systematic review and meta-analysis. *Biology* 2021; 10: 549
3. Shanmugam M, Balaji A, Valiathan M, Kannan R, Jeyaraj A. Preserving peri-implant soft tissue health: a case report on immediate implant placement using the socket shield technique *Cureus* 2024;16(4): e57940.
4. Hu'rzeler MB, Zuhr O, Schupbach P, Rebele SF, Emmanouilidis N, Fickl S. The socket shield technique: a proof-of-principle report. *J Clin Periodontol* 2010; 37: 855–62
5. Kwong KJY, Kitchai R, Matteo D. Immediate implant placement and provisionalization of maxillary anterior single implants. *Periodontol* 2000. 2018;77: 197–212.
6. Gluckman H, Salama M, Du Toit J. Partial extraction therapies (PET) part 1: Maintaining alveolar ridge contour at pontic and immediate implant sites. *Int J Periodontics Restorative Dent* 2016; 36:681-7
7. Venkatraman N, Jain V, Nanda A, Koli DK: Comparison of soft tissue volumetric changes and pink esthetics after immediate implant placement with socket shield and conventional techniques: a randomized controlled trial. *Int J Prosthodont* 2023;36: 674-80.
8. Lee CT, Chiu TS, Chuang SK, Tarnow D, Stoupe J. Alterations of the bone dimension following immediate implant placement into extraction socket: Systematic review and meta-analysis. *J Clin Periodontol* 2014; 41: 914–26.
9. Godil AZ, Kazi AI, Hegde R, Lambe S, Kheur M: Management of a complication with partial extraction therapy: a clinical case letter and clinical recommendations. *J Oral Implantol* 2022; 48:431-5.

10. Al Hachache S, Hussein B, Younes R: Socket-shield technique: where do we stand today? J Osseointegration 2022; 14:194-200

Legend Figures



Figure 1: Pre-operative intra oral photograph (frontal and occlusal views)



Figure 2: Intra oral photograph after FPD removal and Radiovisuograph

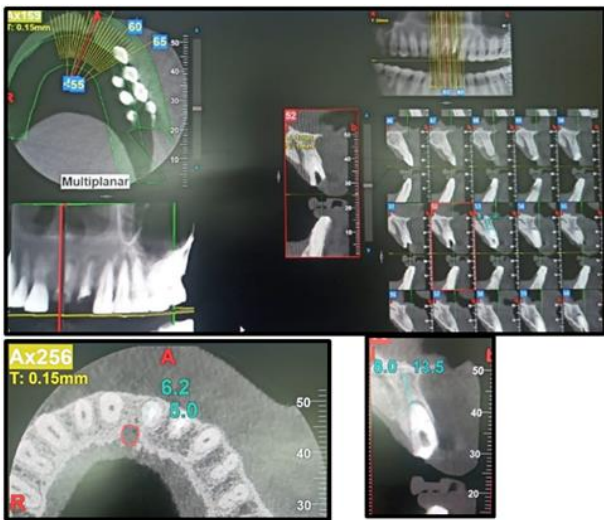


Figure 3: CBCT Evaluation



Figure 4: Preparation of the buccal shield



Figure 5: Sectioned palatal fragment



Figure 6: Dental implant in-situ



Figure 7: Provisional restoration inserted, checked for occlusion



Figure 8: Definitive restoration (PFM Implant supported prosthesis inserted and checked for occlusion)