



PARTIAL EXTRACTION THERAPY: A SAVIOUR IN ESTHETIC ZONE

Dr. Abirami. V*

Assistant Professor., Department of Prosthodontics, Ragas Dental College., 191, East Coast Road, Uthandi, Perungudi, Chennai, Tamil Nadu 600096 *Corresponding Author

Dr. Venkata Raghavan R

Assistant Professor., Department of Periodontics, 191, East Coast Road, Uthandi, Perungudi, Chennai, Tamil Nadu 600096

Dr. Kanimozhi Selvam

Assistant Professor, Department of Prosthodontics, Mahatma Gandhi Postgraduate Institute of Dental Sciences, Puducherry

ABSTRACT **Background** Dental implant restoration in the anterior region requires extreme precision due to high esthetic demand. After extraction, the alveolar bone/socket will undergo dimensional changes which is unavoidable and it will affect the placement of implants in the esthetic zone. Atraumatic extraction, Socket preservation technique, immediate implant placement was introduced which will decrease the alveolar bone resorption by maintaining the post-extraction socket. Though Hürzeler et al. introduced socket-shield technique by keeping the buccal fragment of the tooth to prevent the buccal cortical bone from resorption, still remains technique sensitive and sparsely utilized in clinical practices. This case report enlighten the advantageous of socket shield preservation technique with delayed loading in an esthetic zone. To achieve a facial form, function, esthetics by preserving buccal aspect of root fragments during placement which then converts through osseointegration process certainly into thick bony structure which aids in longevity of implant success.

KEYWORDS : Socket Shield Technique, Partial extraction therapy, Immediate Implant placement, Tooth retention.

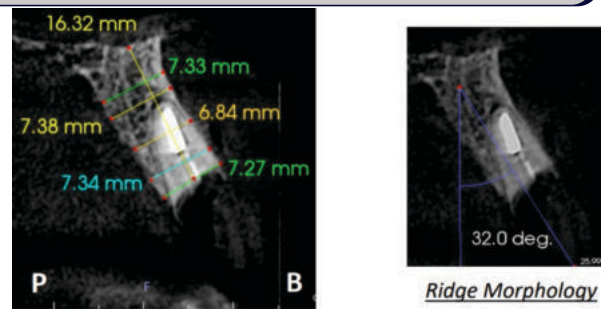
INTRODUCTION:

Hard and soft tissue dimensional changes is an inevitable consequence after tooth extraction, especially in an aesthetic zone. This presents a challenging scenario to a clinician in terms of preserving hard/soft tissue phenotypes, particularly in the maxillary anterior esthetic region. The resorption rate of labial bone in maxillary anterior teeth region is relatively fast due to the loss of blood supply from the cancellous bone (1). As a result, there will be impairment in final outcome both in esthetic and functional aspects in terms of unpredictable long-term soft and hard tissue margins. Many preventive procedures have been attempted in past, but the socket-shield technique (SST) still remains as a predictable therapy with minimum surgical intervention, less duration of total treatment, and an optimum esthetic result achievement (2).

The socket shield technique was first described by Hürzeler et al. The SST was first to be considered as one type of partial extraction therapies (PET), a concept derived from the root submergence technique (RST) initially proposed by Salama et al., for pontic site development. It was developed to preserve healthy periodontium in the marginal area of the buccal side of the implant by partial root retention. Gluckman et al (4) prepared the socket shield as far apical as possible using long shank root resection bur, while Bäumer et al reported leaving only the coronal part of the facial shield. In this case report, the shield was prepared according to Gluckman recommendations since it is more predictable, reproducible, and of low risk for the labial plate fenestration compared to the technique described by Bäumer. This case report will show a clinical case where immediate implant placement in the aesthetic area was performed using SST.

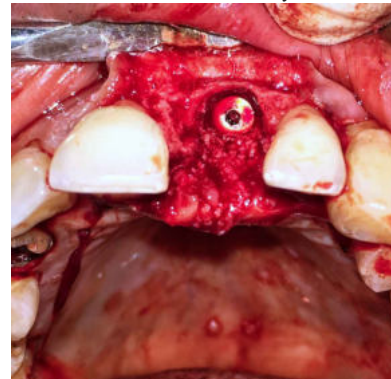
Case Report:**Patient 1**

A 70-year-old male patient reported to department of Periodontics with the chief complaint of fractured tooth in the upper front tooth region. On clinical examination, root stumps irt 21 with thick & flat gingival phenotype. After clinical examination, patient was advised OPG which revealed root canal treated tooth with no any evidence of periapical pathology irt 21. Cone Beam Computed Tomography (CBCT) reveals size of the root irt 21 was (7.3*14.4) mm, 6mm of distance from root apex to nasal floor, bone density is D3 (Misch et al.) with very thin porous discontinuous buccal cortical plate, nasopalatine canal appears 1.98mm palatal to the root irt 21 (Figure 1). On final treatment plan, based upon clinical examination and esthetic concern, treatment plan was extraction followed by immediate implant placement irt 21 using socket-shield technique (SST) due to various factors: favourable fracture line, preserve the labial fragment of the root, preserve architecture of hard/soft tissues.

**Bone Width & Height****Fig:-1****Surgical And Restorative Phase:**

Following local anesthesia, according to the Zuhr/Hürzeler protocol, the coronal buccal root segment was separated from the rest of the root using a long shank root resection bur in a mesiodistal direction along its long axis of the tooth with the intention of preserving facial half of the root intact. Periosteum (Carl Martin, Solingen, Germany) was utilized to extract remaining pieces of the root, without placing excessive stress on the buccal tissues. Then the intact buccal shield was then reduced and contoured according to the socket both in apico-coronal and mesiodistal direction with a long shanked round diamond bur.

Extraction socket was curetted to remove granulation tissue, and buccal root shield was checked for immobility.

**Fig-2**

An osteotomy was then sequentially prepared and before the implant was inserted, intact buccal root was smeared with Emdogain gel (Straumann Group) to prevent epithelial proliferation and bacterial colonization [5, 6], a 3.75 × 13mm Paltop implant was inserted 2mm below the facial crest and palatal to the socket shield and filled with xenograft bone substitute (Tata Memorial Hospital, Tissue Bank) (Figure 2). Primary stability of 35Ncm was gained from the apical and palatal bone to immediately restore with provisional restoration. Sutures and periodontal dressing placed. Postoperative instructions and antibiotics, analgesics, 0.12% chlorhexidine mouthwash prescribed for 1 week. Healing was uneventful with no signs of infection or other complication.

After 6 months postoperatively, clinical and radiographic evaluation of the site was performed (Figure 3). Complete preservation of hard and soft tissue was evident at the surgical site irt 21.



Fig:-3

The definitive permanent cement-retained hybrid zirconia ceramic crown was made (Zolid Zirconia block—Amann Girrbach, cladding ceramics Celtra Ceram, Dentsply Sirona, Charlotte, NC, USA). Crown has been cemented on the implant abutment (RB Variobase® for Crown AS) with the resin cement. Patient under maintenance phase for periodic regular follow-up 3 months, 6 months, and yearly respectively.

Patient 2:

A 20 year old male patient reported with a chief complaint of broken crown in the upper front tooth region and wanted it to be replaced. On clinical examination, root stumps was present irt 21 with thin gingival biotype. After initial examination, CBCT also revealed thin labial cortical plate in 21. Treatment plan was decided to preserve the labial fragment of the root, the socket shield technique was preferred to avoid the fracture of the thin labial plate which creates a major defect in the aesthetic region. As discussed earlier about all surgical and prosthetic phase, socket shield technique (SST) with conventional placement, 3.75 × 13mm genesis implant was inserted 2mm below the facial crest and palatal to the socket shield (Figure 4) followed by immediate temporization was fabricated with composite. After 6 months, permanent prosthesis was done by cement-retained zirconia crown restoration (Figure 5).



Fig-4



Fig-5

DISCUSSION:

Tooth extraction and hard tissue trauma followed by pronounced resorptions especially in the buccal bone plate (7). Preservation of root segment to prevent the alveolar bone resorption was shown in many studies. Salama et al reported the root submergence technique, by keeping root submergence in the pontic area to preserve dimension of alveolar bone. Krump and Barnett et al (8) shows approximately 92.7% of success rate placing endosseous implants into the anterior mandible at the time of dental extractions with appropriate radical alveolectomies ("immediate implants") and it has its own advantages over the delayed loading by reducing the time for a final prosthesis. Histological studies of Hürzeler showed the cementogenesis between the implant surface and the retained root surface and clinically successful osseointegrated implant.

According to Botticelli, Berglundh T, Lindhe J et al(9,10), decision making on placing bone graft is decided by the distance between the implant surface and the socket wall. If the distance is 0.5–1 mm no need for bone graft, if space is more than 1 mm, grafting is indicated.

In this case report, socket-shield technique was performed in an area where the buccal cortical plate was thin and which was likely to fracture. The results were in consistent with the original technique given by Hürzeler et al. No postoperative complication was seen and healing was uneventful.

CONCLUSION:

Socket shield technique which is described in these cases, attained satisfying results in both functional and aesthetic aspects, since it's a very promising for the preservation of hard and soft tissues in cases of post-extraction immediate implant placement.

Declaration of patient consent:

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Key message:

This Case report intended to show by preserving hard and soft tissue architecture, placement and loading of immediate implant tends to serve its purpose for long period of time both in form, function, and esthetics. Understanding the histomorphological changes undergoing in gingival/bony microscopic structure will help us in success of implant.

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