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CASE REPORT

SOCKET SHIELD TECHNIQUE/ PARTIAL EXTRACTION THERAPY IN DOUBLE ROOTED MAXILLARY FIRST PRE MOLAR, THREE YEAR FOLLOW UP: A CASE REPORT.

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ABSTRACT

An immediate implant placement in the anterior aesthetic zone is a challenging job for the operator since it is associated with higher chances of buccal bone resorption both in vertical and horizontal dimensions after extraction of tooth. In the present era of modern implantology newer techniques, materials and methods are introducing day by day to prevent bone loss around immediate extraction implant placement site and maintenance of soft tissue as well as hard tissue architecture around the implant. Partial extraction therapy / socket shield therapy is one of the promising and successful technique to prevent buccal bone loss and maintenance of soft tissue architecture around the implant. In SST a piece of tooth root which is left over the buccal wall to maintain the blood supply through periodontal ligament hence preventing the bone loss and maintaining the volume of surrounding tissue (1). This technique is practiced from single rooted to multiple rooted tooth. The complexity of the technique and chances of procedural error increases with the variation in anatomy of root in term of shape, number, curvature and location inside oral cavity.

INTRODUCTION

Socket shield technique first described by Hurzler in 2010 (2). The technique is originally developed to prevent bone loss and decrease the duration of the treatment period with the maintenance of soft tissue esthetics. Initially socket shield was started in anterior teeth which possess single root anatomy but with course of time the technique evolved due to better understanding of whole science behind this concept, invention of new instruments to perform the procedure in more controlled and atraumatic way, magnification tools, CBCT, clinicians started performing it successfully in a multi rooted teeth (3). Due to the anatomical variation of multi rooted tooth Socket shield technique over these comparatively lesser diameter roots is technique sensitive and requires experienced hands. The author has found a surgical operating microscope as an inevitable tool to perform socket shield over double rooted maxillary pre molar where margin of error is low due to narrow diameter of the roots, curvature of the root and thin buccal cortical plate.

CASE REPORT

A 34 years old female patient came to our practice with a complain of broken tooth, wanted a fix prosthesis. Fractured 14 (first maxillary pre molar).

Which was endodontically treated. There were no other relevant medical history. After clinical and medical evaluation patient were sent for CBCT of the same fractured tooth (Fig-a) for the planning of implant supported prosthesis, because the condition of the fractured tooth was not restorable. On the careful evaluation of CBCT slides we found that the root morphology of 14 lies in class 1 type (double rooted pre molar with inter radicular bone) (4) and the buccal cortical plate was very thin (Fig-b), in most of the cases its less than 1mm (5) , that makes the case ideal for socket shield technique. There were no such pathology related to the fractured root. After evaluation treatment planning was explained to the patient. Socket shield followed by immediate implant placement was planned and her appointment for surgery was scheduled. The surgical procedure was started under antibiotic cover (6) and rinsing with 0.12% chlorhexidine. After establishing local anesthesia with 4% articaine (Septodont, France) and 30 gauge needle. Both the roots of fractured first maxillary pre molar i.e buccal and palatal was separated using high speed long shank carbide bur and with the help of fine luxator, palatal root was removed almost atraumatically. Now with the help of thin long straight fissure diamond bur and carbide bur (Fig-c) carefully and slowly splitted mesio distally to create a buccal shield, but due to the smaller diameter buccal root the task to create a shield out of the buccal root was not as comfortable as it is in bigger rooted maxillary anterior teeth. Doing a SST over multi rooted tooth obviously requires a very skillful surgical hands and meticulous planning. The operator has done all the shield preparation steps like removing palatal portion of the buccal root with whole of the apex and preparation of fine 1.5 to 2mm

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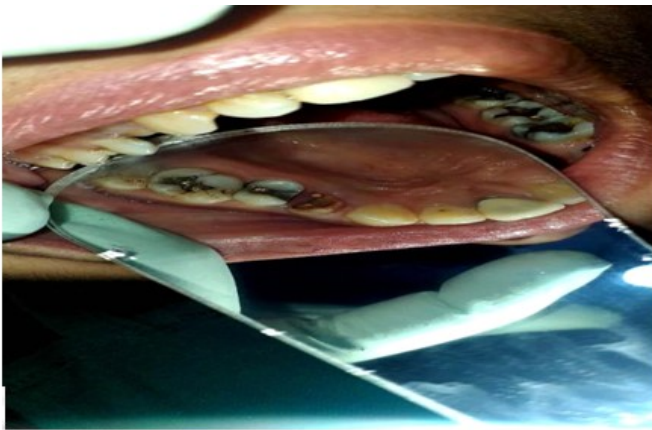


Fig. a. IOPAR and clinical picture shows endodontically treated and fractured double rooted maxillary first pre-molar



Fig-c. Straight fissure long shank carbide bur for splitting both buccal and palatal roots and preparing buccal shield out of buccal root



Fig. d. Prepared thin buccal shield/socket shield and implant placed palatal to shield

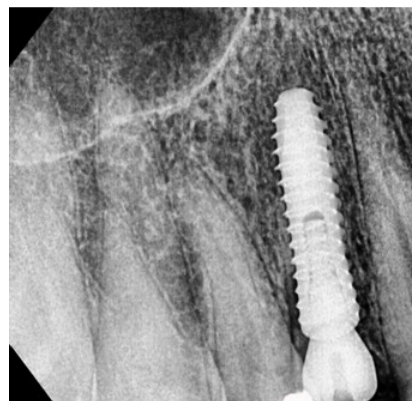


Fig. e. Implant with healing abutment

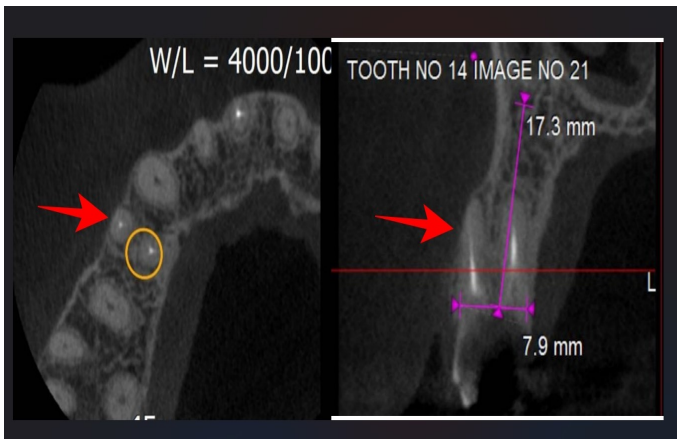


Fig. b. Pre operative Cone Beam Computed Tomography shows very thin buccal cortical plate in both axial and coronal planes

diameter of C shape shield under surgical operating microscope and found the microscope as an inevitable tool to prepare shield over such small diameter root in inaccessible areas of the oral cavity like posterior teeth (Fig-d). After preparing shield a pilot drill was used to achieve the depth of the required osteotomy then after sub sequent osteotomy has been done and implant fixture of size 4x11 has been placed.

After placing the fixture the jump space between implant and shield is grafted with alloplastic graft (Osteon 1, Dentium south korea) followed by placement of healing abutment (fig-e) and suture. Post-operative instructions and medication was given to the patient and recalled after 7 days. On seventh day post-operative healing was found normal and sutures were removed.

Patient reported to dental office after 16 weeks, on clinical examination good soft tissue healing was found (fig-f).



Fig. f. Post operative healing after 16 weeks shows preservation of soft tissue architecture

An open tray impression has been taken and sent to laboratory for the fabrication of screw retained porcelain fuse to metal prosthesis. Prosthesis was delivered and the patient was explained about post-operative maintenance. After 2 years patient reported to dental office for regular check up, a CBCT scan was done to evaluate the hard tissue architecture around the fixture. On examination of CBCT slides we have found an abundant buccal cortical plate thickness. On comparison of both pre-operative and 3 years post-operative CBCT scans (Fig-g) we found there is no buccal bone collapse which usually encountered in routine immediate extraction placement cases done without socket shield technique.



Fig. g. Cone Beam Computed Tomography shows intact buccal cortical plates and preservation of hard tissue architecture due to socket shield preparation both in axial and coronal views

CONCLUSION

Socket shield technique lowers overall treatment time and cost, it delivers better outcome in low cost and uses the body for itself to prevent buccal bone collapse which happens after extraction of tooth. And its more predictable and evidence based in comparison to conventional technique in which we use the bone grafts and membranes but it requires a proper case selection and skillful surgical hands to execute the procedure. There is also some contraindication of SST like tooth mobility, pathology, horizontal and vertical root fracture, anatomical restrictions, periodontal diseases, curved roots of multi rooted tooth and posterior teeth where mouth opening is an issue to perform the procedure (7).

Conflict of Interest: There is no.

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