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SOCKET SHIELD TECHNIQUE

Dental Science

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ABSTRACT

Tooth extraction leads to a cascade of events resulting in resorption of alveolar bone around the socket. In the socket-shield technique, the root is bisected and buccal two-third of the root is preserved in the socket, leaving the periodontium along with bundle bone and buccal bone intact. This article aims to collect and evaluate the available literature associated with the socket shield technique as first described by Hurzeler et al (2010).

KEYWORDS

Socket Shield, Immediate Implant, Osseointegration

INTRODUCTION

In recent decade, dental implants have become a gold standard for the missing tooth replacement purpose. Previously, dental implants were used to support multi-unit prosthesis, with recent advances these are now used to replace single missing tooth, particularly in the esthetic zone of the jaw. Various studies have concluded that if a tooth root is left in alveolar socket, buccal bone can be preserved.[1] However, intentional root retention to preserve bone is not practiced routinely, till date.[1]

PRINCIPLE OF SOCKET SHIELD TECHNIQUE[2]

The foremost purpose of the Socket Shield technique is to preserve the buccal bone plate by creating a buccal shield.

INDICATIONS[2]

- For prevention OF Buccal plate in case of immediate implants.
- In vertically fractured tooth without pupal pathologies.
- To secure dental papilla between dental implants.

CONTRAINDICATIONS[2]

- Loss of buccal bone due to vertical fracture.
- Loss of buccal bone due to periodontitis.
- Root caries

Table 1: Advantages And Disadvantages[3]

ADVANTAGES	DISADVANTAGES
No additional material cost	Not yet predictable
No co-morbidity	No long term data available
Single surgery	Technique sensitive
Can be done in sites with apical pathology	Require more time
Assures safeguard of peri-implant tissues.	Shifting of buccal root portion or even buccal lamellar bone.
Helps to retain esthetics	
Guides to place implant in proper location	
Complete osseointegration can be achieved	

STEPS OF SURGICAL PROCEDURE[3]

Under local anesthesia, following procedure is done:

- Clinical crown is separated above the gingival level, with a diamond bur.
- Using long tapered fissure diamond bur, tooth is sectioned vertically.
- The palatal root portion is removed carefully with periotomes and forceps, without putting stress on the buccal tissue.
- Root portion is thinned to a thickness of 2mm using round diamond bur with saline irrigation.
- An osteotomy is planned and implant is placed palatal to the socket shield.
- Gap between the shield and implant is left to permit blood clot formation.

Implant site is then closed with sutures

DISCUSSION

Hurzeler et al.[1,4] in his study (in beagle dogs) published a proof-of-principle study stating that leaving a 1.5 mm thick root fragment on the buccal aspect of the implant site, would be sufficient leaving space for implant placement, maintaining the buccal plate.

A recently published systematic review by Mourya et al.[5] stated that modifications to the technique gave promising positive results, although the graft application did not play much role associated with socket shield technique. Thereafter, a study by Christian et al. also does not clearly shows whether the socket shield technique will provide a stable long term outcome.[1]

Baumer et al.[6] stated in there study that the socket shield technique shows great esthetic results with preservation of facial tissue contour. Likewise, Siormpas KD et al. published in their study that intentional root retention with it's intact periodontal mechanism can lead to continuous osseointegration of implants placed in maxillary anterior region.[7]

Kan et al. observed in a case with modified shield technique, with the shield located in the interproximal areas for inter-implant papilla preservation with a successful outcome in preserving bone level and periodontium.[8]

Glocker et al. performed three cases of modified shield technique and delayed implant placement. After six months the new bone forming and the residual ridge was assessed and preserved via this technique.[9]

Likewise, similar outcome was reported by Chen et al,[10] Mitsias et al,[11] Lagas et al,[12] Engelke et al,[13] Al Dary et al.[14]

Anas et al. reported SS technique to be fruitful in esthetically challenging areas.[3]

CLASSIFICATION OF PREDICTED HEIGHT OF INTERDENTAL PAPILLA[15]

The classification is proposed to help in understanding the clinical application of this technique

TYPE	DESCRIPTION	INDI INDICATION
Type 1: Buccal shield	The shield lies in the buccal part of the socket (between proximal line angles of tooth).	It is indicated in single edentulous site with both mesial and distal tooth present.
Type 2: Full C Buccal shield	The shield lies in buccal part and the interproximal part on both the sides of the socket.	It is indicated for the following clinical scenarios: • Implant existing on either side of the proposed site. • Missing tooth on either side without an implant. • Having implant on one side and missing tooth on one side.
Type 3: Half C Buccal shield	The shield lies in buccal part and the interproximal part.	It is recommended in case of tooth on one side and implant on the other side.
Type 4: Interproximal shield	Here the shield lies only in the mesial/distal part of the socket.	It is indicated in case of buccal bone resorption, requiring graft with implant/missing tooth on a side
Type 5: Lingual-palatal shield	The shield lies on the lingual/palatal side of the socket.	It can be considered for maxillary molars.
Type 6: Multiple Buccal shields	It is a case with two or more shields in the socket.	It is indicated in cases with a vertical root fracture.

COMPLICATIONS[1]

Various other complications reported were:

- Resorption of the socket shield
- Peri-implantitis
- Non-integration of the implants

CONCLUSION

Socket shield technique is gaining popularity among the clinicians worldwide. It has proven to be a promising technique for the preservation of bony buccal plate for immediate implant placement.

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