



CASE REPORT

Esthetic Implant Restorations for Replacing Maxillary Anterior Tooth

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Abstract: Esthetic replacement of Maxillary Anterior single tooth by implant-supported restoration is a challenging task in most situations. Osseo integration has become predictable but soft tissue drape responsible for overall esthetics demands a respectful handling at all stages of implant treatment. This article brings to light the aspects that help maximize the esthetic results and presents a case that shows different techniques that enhance the esthetic outcome of implant-supported maxillary anterior single tooth at various stages of treatment

Key words: implant, gingival esthetics, esthetic restoration

The Prince among teeth, the showman of our mouth, probably no other tooth in mouth generates a greater emotional response upon its loss as a Maxillary Anterior Tooth. The anxiety associated with, and the utter urgency with which the replacement of this tooth is sought, is overwhelming. It is also a zone of mouth where most patients are reluctant to have their adjacent virgin teeth prepared, just to serve as abutments for a FPD. This suggestion triggers a response in patients mind that instead of one, they are going to have three artificial teeth.

Patients and dentists show a higher degree of interest when single tooth replacement with implants is being considered as a treatment option. Favorable long-term prognosis for implant supported, single tooth replacement has now much evidence in its favour. [2-6] A novice operator might think replacing a maxillary anterior single tooth by implant to be an easy case to start with as this zone of mouth has the maximum visibility to the operator. But remember that this esthetic zone of mouth also has the maximum visibility for the patient. Actually, it is one of the highly demanding restorations to accomplish that needs to fulfill the requirements of function, form and esthetics dealing gently with bone, connective tissue and epithelium.

surgical planning proper implant positioning esthetic zone to achieve a natural looking

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implant supported restoration have been suggested by some authors, which help dentist achieve their goal.

One of the key factors in achieving an esthetic implant restoration for maxillary anterior tooth is proper soft tissue management. Mishandling of the soft tissue at any Stage Of implant dentistry often results in esthetically unacceptable restorations, and once they happen they are often difficult to correct. Various techniques have evolved in the past decade which include sculpting soft tissue, using connective tissue grafts, free gingival grafts, modifying soft tissue margin with the use of prosthetic components, new flap designs that minimize soft tissue complications and introducing new methods to increase soft tissue height at the time of second stage

[17] surgery.

There cannot be a more miserable situation than to have a well Osseointegrated implant in mouth that is not possible to restore prosthetically because of poor placement position, angulation or location. Factors that can best be avoided by proper pre-surgical planning. Each potential implant site should be considered from the optimal perspective of the anticipated restoration.[18] It is the prosthetic restoration that the patient sees and appreciates, not the submerged fixture. So should be the treatment planning for implant restorations, prosthetic based.

Factors that influence treatment of replacing a maxillary anterior single tooth are-

Age : While there is no upper age
Esthetic Implan

placement, it is logical to wait in younger patients until skeletal and dental growth is complete.

Time : While a Fixed Partial denture may be completed in a week or two, an implant supported restoration takes 3 to 6 months to be completed. Only some selected cases may be considered for immediate implant placement/early loading.

Cost : Usually an implant-supported single tooth would cost more to the patient than a FPD. This is because for the dentist the time devoted, inventory, etc. escalate the cost.

Patient's attitude : Patients who are fearful of the idea of a surgery, patients with unrealistic expectations and skeptical patients don't make good implant patients. All this applies more in the esthetic zone of anterior maxilla where visibility is maximum. A patient leading a socially active life will also demand a transitional prosthesis. The type and limitations of transitional prosthesis must be discussed and planned. It is very important to obtain an informed consent.

Space : The available inter-occlusal space, crown height, and the available bone volume are some of the crucial factors that need to be considered. Often in the anterior maxilla the ridge may appear adequate but upon reflecting the mucoperiosteum, only a thin bony ridge is encountered. Direct bone measurements or X-ray scanning will reveal the actual available bone. For the anterior maxilla region a faciopalatal width less than 5 mm and a mesiodistal width of less than 6mm would indicate inadequate bone. Also to be considered is available bone height so as not to violate the nasal floor. The position of the incisive canal, the root angulation of adjacent teeth, adjacent teeth mobility are also factors that need attention.

Soft tissue : The 'pink' esthetics is as important as the



Fig 1 — X-ray of fractured root

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'white' esthetics. Soft tissue considerations have already been discussed in introduction earlier.

Positioning : Optimum positioning Of fixture can be achieved by using a surgery guide template Implant positioning is evaluated in three, three-dimensional planes namely the mesio-distal plane the labio-palatal plane, and the apico-occlusal plane.

A mesio-distal positioning has been discussed already. The recommended space between an implant and a natural tooth is 1.5 mm to 2 mm, measured from the outer circumferential edge of the tooth to the edge of implant fixture.

The labio-palatal plane usually is dictated by available bone in the anterior maxilla; but to achieve optimum esthetics it is advisable to locate the implant in the center of the long axis of the crown, leaving at least 1 mm of bone labio-palatally. [19 - 20 The apico-occlusal positioning of the implant in an axial direction must be 2 to 3 mm above an imaginary line connecting the cemento-enamel junction (CEJ) of the adjacent teeth. This results in an esthetic emergence profile.

CLINICAL CASE PRESENTATION

A 25 year old male patient came to the dental clinic with complaint of pain in the right upper front teeth. His history revealed trauma to the right central incisor two months back.

On clinical examination tooth was tender on horizontal and vertical percussion. Radiograph was advised and it showed a horizontal fracture of the root at middle third on the endodontically treated teeth(Fig-1).The patient was healthy and a nonsmoker.

A review of his medical history revealed no significant medical problems or medications. It was planned to extract the tooth and to place and load the implant



Fig 2 — X-ray of implant placed immediately after extraction



Fig 3 _ Post treatment with crown in place immediately by custom build provisional restoration to preserve the preoperative gingival architecture for maximum esthetics.

The implant selection and placement had to be prosthetically driven and not just to fit into available bone. A Bio Horizons D 3 implant 4 mm in diameter and 15 mm in length was placed under local anaesthesia into the prepared site achieving a good primary stability following atraumatic extraction (Fig-2). However at this time the gingival tissue was not esthetically contoured as was evident after fixing the standard abutment over the implant. In order to create a natural tooth-like emergence profile and soft tissue drape, reshaping of gingiva with a diamond bur and expansion of soft tissue using a

customized crown, build-up with composite over a standard abutment was done. A period of 6-8 weeks was allowed for the temporary crown to serve the patient. Mature and stable soft tissue drape with a preserved interdental papilla was now available to receive the final crown. The final crown looks just like a natural tooth emerging out of gingival (Fig-3).

DISCUSSION

In cases where the structure of postextraction sockets can be preserved, implant treatment with immediate provisionalization offers several advantages. Optimal esthetics is achievable as: bone and soft tissue architectures are maintained; patients are provided oration at the time of surgery since second stage bone regeneration therapy

should be prepared to adjust the mesial and distal contact of the provisional crown contact and inadvertent loading implant from the adjacent teeth.

occlusion of the restoration

necessary reduce the occlusal surface to keep the provisional restoration free from occlusal load from the opposing dentition.[21]

One advantage of using this provisional restoration technique is the development of the gingival sulcus. The provisional restoration will shape the gingival sulcus, providing the restorative dentist with less needed

manipulation of the implant site soft tissue morphology. [22] The maturation of the soft tissue allows for immediate placement of the final restoration after the implant has integrated. The soft tissues have appeared stable in form after they have healed from the implant surgery.

CONCLUSION

Based on this study, immediate provisionalization of anterior single, threaded implants can effectively optimize peri-implant esthetics by maintaining the existing hard and soft tissue architecture of the replaced tooth. In addition, the immediate placement of a fixed provisional restoration can minimize the emotional trauma of losing a maxillary anterior tooth and eliminates the need for a removable provisional restoration.

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How to cite this article:

Babu Rajan et al

Babu Rajan K, Srinivasan J, Shivasakthy M, Sivasenthil S. Esthetic Implant Restorations for Replacing Maxillary Anterior Single tooth. *Journal of Scientific Dentistry* 2011 ; 1(1)

Conflict of Interest: None declared