

Implant and natural tooth connection – A Surgeons dilemma: A Case Report

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Abstract

Natural tooth and Osseo-integrated implant connection generally presents a biomechanical challenge for Oral and Maxillofacial Surgeons. The evidences in literature reports that connecting the implant (rigidly fixed to the bone) and the tooth (attached to the bone with a periodontal ligament) is risky as it may lead the failure of prosthesis hence various connection types such as rigid and non-rigid have been proposed by various authors.

Keywords: *Implant, Osseo-integration, periodontal ligament, FPD*

Introduction:

Implant-tooth connection for restoration of an edentulous span with a fixed prosthesis has long been criticised and it was believed that splinting a natural tooth with an implant leads to the failure of the prosthesis since the former is attached to the bone with a periodontal ligament while the latter is rigidly osseointegrated to the bone. Most of the literature does not support the hypothesis of connecting the rigidly ankylosed implant to relatively mobile dentition⁽¹⁻³⁾

With the advances in dentistry and modern technology, these limitations have been overcome by clinicians without any adverse effects to the implant, natural tooth or the prosthesis connected⁽⁴⁻⁵⁾

While on one hand some researchers recommend avoiding splinting of tooth and implant because of the difference in the support system of each⁽⁶⁻⁷⁾, some have reported successful connection between the tooth and implant as the stability of prosthesis depends on the outcome of treatment done⁽⁴⁾ “Prosthesis in Combination of tooth with implant is highly acceptable” says Belser et al⁽⁸⁾. High level of patient satisfaction with the implant-tooth supported rigid prosthesis has been reported⁽⁹⁾

Hereby the authors report a case of fixed prosthesis, supported by splinting two natural teeth to the implant in maxillary region of a 34 year old female.

Case report:

A 34 year old female patient reported to department of oral and maxillofacial surgery in the Oxford Dental College with multiple missing teeth in her upper right back tooth region. She gave history of edentulism due to pathogenic cause, following which her teeth were extracted.

Examination: The concerned area was examined and was noted that multiple teeth were missing-

13-upper canine, 15-upper premolar, 16-upper first molar, 17-upper second molar and 18-upper third molar (figure 1).

Treatment planning:

After the initial diagnosis, the patient was given the option of fixed or removable prosthesis and was explained about the advantages and disadvantages if any. Patient's treatment of choice was a fixed prosthesis but the patient wanted to retain her natural teeth and was not comfortable with the idea of individual implants in edentulous space considering the cost and invasiveness of the treatment. A detailed treatment plan was discussed and prosthodontic opinions were also considered. Hence, it was decided to give her an implant-tooth connected fixed partial denture, where the natural teeth were used as an abutment. According to the requirement of the case, a single implant of 3.36mm was placed in between the inter-radicular bone of upper first and second molar respectively by taking support of natural teeth where, upper lateral and first premolar respectively were taken as an abutment. Two natural teeth had to be considered for the treatments as prosthesis was placed on the posterior maxillary arch, which bears load during mastication and other functional activities.

Radiographic Analysis:

The pre-operative CBCT showed an edentulous span in the maxillary right posterior region with good bone quantity and quality. The teeth to be considered as abutments did not show any signs of pathology or bone loss. First premolar (14) and lateral (12) were taken as abutments and the dense interradicular bone between first (16) and second molar (17) was the selected site of implant placement (no sinus approximation was seen).

Results:

Follow up for the patient was done for 3 years and patient was evaluated intra-orally for implant stability, peri-implantitis and periodontal pockets. The post operative OPG (figure 2) and photographs (figure 3) showed excellent healing, clinically and functionally; the patient was satisfied with the outcome of the treatment. No signs of mobility, infection or any abnormality were noted and the rehabilitation was a success.

DISCUSSION:

There is a difference in the visco-elastic and biomechanical property of a osseointegrated implant and a natural tooth. Prosthesis with such a combination should be planned carefully after clinical and radiographic evaluation. Periodontal status and bone availability around the natural tooth are two immense factors that should be considered to correctly select the natural tooth as an abutment. Teeth with clinical mobility should not be considered for rigid prosthesis⁽¹⁰⁾. A group case discussion is encouraged for such cases which should comprise of an oral surgeon, a prosthodontist and a periodontist. A treatment of such nature is multi-staged. From treatment planning to surgical implant placement and followed by rehabilitation with a fixed prosthesis requires excellent skill and communication amongst various specialities to provide excellent patient care.

Another key factor is tooth to implant distance; long and intermediate pontic between tooth and implant which may result into stress and bending of the bridge due to presence of axial forces⁽¹¹⁾. Implants connected with teeth have long been used to support distraction osteogenesis devices which allow successful augmentation of bone length and height⁽¹²⁾.

Advantages:

Joining tooth to implant for rehabilitation of partial edentulous cases provide clinician with alternate treatment modality where proprioception and bone volume can be maintained eliminating the use of distal cantilevers and free end saddles that causes resorption of bone.

Conclusion:

Further research is required on many aspects of this treatment paradigm. No conclusive studies are available to show the best number of implants and teeth to be connected using this treatment option. In addition, no conclusive evidence is available to show the best prosthesis span length that can be supported via connecting teeth and implants. Hereby the authors have reported a case of complete functionality and stability of the tooth-implant, rigidly connected with an FPD and hope that this study might lay the grounds of further research and yield more successful results.

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Fig 1: Clinical photograph showing absence of multiple teeth in upper right tooth region.



Fig 2: radiograph showing fixed prosthesis supported with splinted implant and natural dentition.



Fig 3: postoperative pictures (3 year follow up period): Profile and intraoral photographs.

