

Orthodontic mini implant: Versatile application for clinical enhancement

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Abstract

The use of Orthodontic mini implant (OMI) anchorage is rapidly growing these days. In the recent years it has become a compulsory tool for orthodontist. With the better understanding of the biomechanics not only all kinds of tooth movement is possible with mini implant but orthopedic and orthognathic like effects can also be produced with judicious application of this device. Here we present two cases treated with the help of OMI. The first case needed maximum anchorage due to the degree of crowding and protrusive facial profile. The conventional orthodontic treatment could have produced good result but the ideal result was possible only with the absolute anchorage using mini implant. In the second case there was supra eruption of left maxillary second premolar and first molar. The OMI was used to intrude the supra erupted teeth. The almost impossible tooth movement with conventional orthodontic treatment was possible with the insertion of these implants buccally and palatally, within a period of six months and without any side effects.

Key words: Orthodontic mini implant(OMI), Anchorage, Centre of resisitance, Intrusion, Retraction

During the last two decades, the orthodontic mini implant (OMI) has progressed so much that now it is the everyday armamentarium of an orthodontist. A thorough review of the literature finds that implants for the orthodontic purposes were tried even before Branemark who introduced the dental implant^{1,2}. The screws used for the internal fixation of the fracture sites were used for the orthodontic purposes. Initially stainless steel, then vitallium and now titanium screws are used. However, except few case reports the regular and advanced use of orthodontic mini implants started around the beginning of the new millennium. In 1970 Linkow described the prosthetic implant for orthodontic purpose in a case report³. He presented six cases treated with the help of blade implants. After that regular prosthetic implants were used for the orthodontic anchorage. It undoubtedly served the orthodontic speciality for many years and still are used in some multi disciplinary cases. Those implants were tried even in retro molar area and tuberosity areas for the sake of orthodontic anchorage. However the biggest disadvantage of these implants was their size which confined their placement only in edentulous ridges or retro molar areas.

In the search of small dimension implants and with the idea of surgical screws, the present day orthodontic mini implants were developed. The first purely orthodontic implant dates back to 1983. Greekmore et al inserted surgical screw just below the anterior nasal spine to reduce the anterior deep bite⁴. The implant was made of vitallium and served the orthodontic purpose reducing the deep bite by 6 mm in one year time period. Roberts et al did several animal experiments in the eighties. They had inserted 2mm diameter implants in the femur of the dogs and rabbits with high success rate but similar result were not found in oral cavity⁵. Block and Hoffman in 1995 discovered onplant and used palate as an anchorage source⁶. In 1997 Kanomi used the 1.2mm diameter implant for orthodontic purpose⁷. Since then there have been floods of case reports and clinical researches on mini-implant anchorage. Now there are different designs of orthodontic implants in the market. The continuous modification of the design is still going on and is an on going process. Due to its small dimension (< 2mm in diameter), it can be placed in most of the areas like inter radicular space, mid palatal suture, para-median area of palate, retro molar areas etc. and can be

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