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RESEARCH ARTICLE

ORTHODONTIC INTRUSION OF SINGLE MOLAR USING MINI IMPLANT- PRE-PROSTHETIC ORTHODONTICS-A CASE REPORT!

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Abstract

Aim: To demonstrate a case using mini-implant-supported orthodontic molar intrusion to regain ideal crown height space (CHS) for a prosthetic crown.

Background: Supraerupted maxillary molars are a common clinical finding either due to tooth loss or due to loss of structure of mandibular molar. Hence, it is necessary to regain the lost vertical dimension before the prosthesis, either conventionally by endodontic and prosthetic intervention or by orthodontic intrusion with the aid of temporary anchorage devices (TADs).

Conclusion: The present case report demonstrated the successful role of mini-implants in orthodontic molar intrusion for establishing an ideal CHS for a prosthetic crown.

Introduction:-

Molar intrusion has always been a tough and complicated condition to treat. It can be used to treat individuals with open bites or molar teeth that have over-erupted. Various treatment options for intruding molar teeth have been developed over the years, ranging from non-surgical to surgical approaches and utilizing a variety of equipment, some of which rely on patient cooperation. In recent years, the use of temporary anchoring devices (TADs) has allowed for the intrusion of posterior teeth with minimum patient compliance. (1)

Adults with limited or no access to dentistry during childhood and adolescence are more likely to have supraerupted posterior teeth due to the early loss of their antagonists.(2) Early loss of any molar will almost always result in supraeruption of the opposing molar into the empty space. Overeruption of such a molar can cause occlusal interference and functional disturbances, as well as make prosthetic reconstruction extremely difficult.(3)

A TAD is a device that is temporarily fixed to the bone to improve orthodontic anchoring, either by supporting the reactive unit's teeth or by eliminating the need for the reactive unit entirely, and is then removed after use. The TADs used for molar intrusion are mini-implants or zygomatic plates that aid in achieving ideal results maintaining functional occlusion. Mini-implants can be used to achieve ideal orthodontic results in both the anterior and posterior regions. Mini-implant-supported intrusion aids in the restoration of the prosthetic crown's lost vertical dimension.(4)

Thus, the purpose of this article is to demonstrate a case in which maxillary molar intrusion was achieved using orthodontic mini-implants to regain ideal crown height space for a prosthetic crown in the lower arch.

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Case Report

Diagnosis And Treatment Planning

A 22-year-old male patient reported with a chief complaint of wanting a prosthesis for his lower molar (46). The tooth was treated endodontically 6 months earlier. On clinical examination, the patient presented with ideal overjet and overbite and a Class II molar relationship bilaterally. Upper left first molar (16) was supra erupted reducing the space between the mandibular ridge crest and the buccal cusp of 16 to 4 mm. (FIG 1)

Diagnostic casts were prepared. The treatment plan included placement of a prosthetic crown in 46, after the intrusion of 16 using orthodontic mini-implants.

Mini-Implant Placement In Maxilla

The following is the technique for placing mini-implant. Anesthetize the implant side first. Mark the implant site on the gingiva with a periodontal probe after examining the form and position of the roots on panoramic and periapical x-rays. insert the mini-implant (in the connected gingiva, wherever possible) after checking the position of the mucogingival junction from the buccal side. Measure the soft tissue thickness in the location where the screw will be put on the palatal side of the maxilla. Use a mini implant with a diameter of 1.5 mm to ensure retention and avoid fracture. To place the implant, use a contra-angle screwdriver and the self-tapping method; a solid implantation technique is essential.Begin loading 2 weeks after the implantation to aid soft tissue healing. For anterior teeth, a light force (10-20 g per tooth) is recommended, while for posterior teeth, a larger force (150-200 g per tooth) is required for intrusion. Take periapical x-rays by changing the cone mesiodistally to check the position of the mini-screw and the proximal roots. Check for root resorption using periapical or panoramic radiographs on a regular basis.

Mini-implants were placed in the maxillary arch. On the buccal and palatal side, a 1.5 × 9 mm mini-implant (S.K. Surgicals) was placed. They were placed between 16 and 17 on the buccal side and between 15 and 16 on the palatal side. The patient was recalled after 1 week to check the stability of the implant. When the implant was stable, a force of 100 to 150 gm was applied with an E-chain by engaging into the two mini-implant.(fig 2,3) The force was measured with a Dontrix force gauge and it was maintained in place using composite. The patient was recalled every 2 weeks to evaluate the intrusion. A 3mm intrusion was achieved within 3 months with an additional 1-month retention period, to prevent relapse until crown placement in 46. (Fig 4,5,6,7)

Final Prosthesis

Once the minimum space required for a cement-retained crown was achieved. A metal-ceramic crown was fabricated and cemented. Post cementation clinical and radiographic follow-ups were done up to 6 months (fig 8)

Discussion:-

From the crest of the bone to the plane of occlusion, the crown height space for the prosthesis is measured. Attempting to make a prosthesis with insufficient restorative space may result in physiologically inappropriate counters, structurally weak prosthesis and esthetic compromise, and/or suboptimal retention and stability of the treatment results.(5)

In cases where supra-eruption of the upper molar occurs into the extraction site, anchorage is a key concern during orthodontic tooth movement. Treating minor discrepancies with conventional mechanotherapy could result in anchor loss. It is possible to intrude a molar using TADs by applying force from the buccal and palatal sides by engaging an E-chain with minimal to no anchor loss.

In the present case,One mini-implant was placed in the buccal dentoalveolus between the first and second molars at the level of the mucogingival junction, and the other was placed in the palatal slope between the second premolar and first molar just medial to the greater palatine nerve to intrude the supraerupted maxillary molar. The second premolar and first molar have the most maxillary interradicular bone in the mesiodistal direction, buccally and palatally. To avoid the greater palatine foramen and the porous trabecular bone seen in the posterior maxilla, the palatal mini-implant was positioned mesial to the first molar. A buccal mini-implant could be placed since there was enough interradicular room and attached gingiva distal to the first molar.(6) On both sides, mini-implants were placed at the level of the tooth's center of resistance, resulting in bodily intrusive movement of the upper molar.

When absolute anchoring is required, mini-implants have recently received a lot of attention in orthodontics. Mini-implants overcome some of the challenges associated with previous intrusion devices while also providing additional benefits. Their basic design makes them more comfortable for the patient; side effects, such as anchorage loss are minimal, ensuring more reliable results; and the insertion procedure, as well as adjusting the direction and amount of force, is relatively simple.(7)

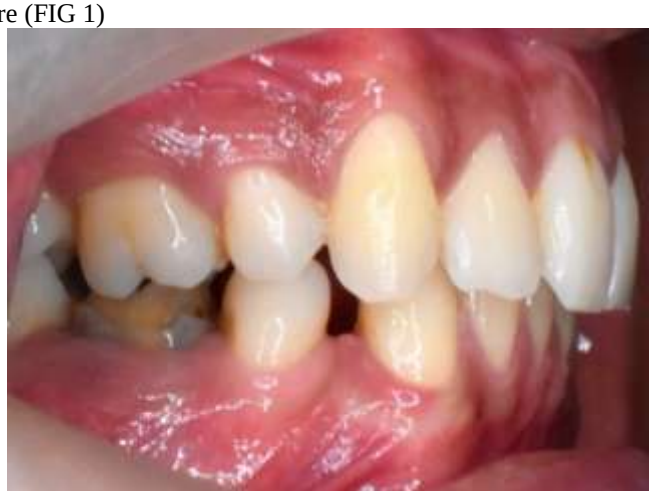
Orthodontic mini-implants are simple and excellent anchorage devices, and providing an opportunity for clinicians to perform desired tooth movements without unnecessarily sacrificing the healthy tooth structure of the antagonist tooth. A 6-month follow-up showed stable treatment results with a good level of patient satisfaction.

Conclusion:-

The present case report demonstrates the successful role of mini-implants in molar intrusion for establishing an ideal crown height space for a prosthetic crown in the opposing tooth.

Color Plates

Pretreatment Intraoral Picture (FIG 1)



Implant Placed And Engaged With E-Chain Irt 16 (FIG 2,3)

Pre-Treatment Iopar (FIG 4)

Post Intrusion Intra Oral Picture (FIG 5)

Post Intrusion Cast (FIG 6)

Post Intrusion Iopar (FIG 7)

Post Treatment Intraoral Picture After Placing Prosthetic Crown Irt 46 (FIG 8)

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