Oral Surgery: Orthodontic Related Procedures

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Instructions for Use

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Coverage Rationale

Surgical Placement of Temporary Anchorage Device (Not Related to Distraction Osteogenesis or Orthognathic Surgery)

The surgical placement of temporary Anchorage devices are used in conjunction with orthodontic treatment and are indicated for individuals aged 12 and over for the following:

- Intrusion of maxillary teeth
- Molar Distalization
- Canine Retraction and Intrusion Retraction mechanics
- Correction of anterior Open Bite and deep Overbite
- Correction of canted Occlusal Planes

The surgical placement of a temporary Anchorage device is not indicated for individuals with any of the following:

- Known allergy to titanium alloy
- History of heavy tobacco use
- Advanced osteoporosis
- Uncontrolled immune or metabolic bone disorders
- Unmanaged medical conditions that result in excessive bleeding, reduced resistance to infection, or poor healing response
- Poor oral hygiene
- Poor quality cortical bone density and volume
- Ankylosed teeth

Surgical Access of Unerupted Tooth

Surgical access of unerupted tooth is indicated for the following:

- When a normally developing permanent tooth is unable to erupt into a functional position
- For labially impacted teeth if there will be 2-3 mm of gingival cuff present after eruption

Surgical access of unerupted tooth is not indicated for the following:

- For supernumerary teeth and third molars
- When surgical access of impacted tooth would threaten vital structures

- Individuals with unmanaged medical conditions that result in excessive bleeding, reduced resistance to infection, or poor healing response

Placement of Device to Facilitate Eruption of Impacted Tooth

This is the placement of an orthodontic bracket, band or other device and attached with a chain, on an unerupted tooth, after surgical exposure, to aid in its eruption. This procedure is done following the surgical access of an unerupted tooth.

Corticotomy (Not Related to Distraction Osteogenesis or Orthognathic Surgery)

Corticotomy (also known as periodontally accelerated osteogenic orthodontics [PAOO] or surgically assisted osteogenic orthodontics [SAOO]) is unproven due to insufficient evidence of efficacy.

Mobilization of Erupted or Malpositioned Tooth to Aid Eruption

Mobilization of erupted or malpositioned tooth to aid eruption is indicated for the treatment of ankylosed permanent teeth.

Definitions

Anchorage: Resistance to force. Anchorage may come from any of the following sources: intraoral (teeth, bone, soft tissue, implants), or extraoral (cervical, occipital, cranial) (AAO).

Angle's Classification of Malocclusion: A classification of malocclusion introduced by Edward H. Angle. The governing criterion is the anteroposterior relationship of maxillary and mandibular first molars (AAO).

- Class I Malocclusion (Neutroclusion): A malocclusion in which the mesiobuccal cusp of the maxillary first molar occludes in the buccal groove of the mandibular first molar. "Class I" is sometimes incorrectly used as a synonym for normal occlusion, whereas it signifies only a normal sagittal relationship of maxillary and mandibular posterior teeth as they meet.
- Class II Malocclusion (Distoclusion): A distal (posterior) placement of the mandibular (lower) molar, a mesial (anterior) relationship of the maxillary (upper), or a combination of the two. The mesiobuccal cusp of the maxillary first molar occludes mesial to the buccal groove of the mandibular first molar, usually near the embrasure between the mandibular molar and second premolar.
  - Division 1: A Class II molar relationship with proclined maxillary incisors.
  - Division 2: A Class II molar relationship, usually with the maxillary central incisors tipped lingually, the maxillary lateral incisors tipped labially. This malocclusion, in many instances, has and an excessive Overbite.
  - Subdivision: Subdivision of any malocclusion category denotes a unilateral malocclusion classification (e.g., Class II, division 2, subdivision).
- Class III Malocclusion (Mesioclusion): Mesial (anterior) relationship of the mandibular first molar to the maxillary first molar, a retruded relationship of the maxillary first molar to the mandibular, or a combination of the two. The mesiobuccal cusp of the maxillary first molar will typically occlude near the embrasure between the mandibular first and second molars.

Ankylosis: Abnormal immobility, union or fusion. It may occur between two bones at their articulation (e.g., TMJ) or between teeth and alveolar bone (AAO).

Distalization: A common descriptor for the biomechanics involved in moving maxillary first and second molars distally and into a Class I molar relationship.

Intrusion: A translational form of tooth movement directed apically and parallel to the long axis of a tooth (AAO).

Occlusal Plane: The imaginary surface on which upper and lower teeth meet in occlusion. It is actually a compound curved surface, but is commonly approximated by a plane (straight line in the lateral view) based on specific reference points within the dental arches (AAO).

Open Bite: Lack of tooth contact in an occluding position (also called apertognathia) (AAO).

Orthognathic Surgery: Orthognathic Surgery is the surgical correction of abnormalities of the mandible, maxilla, or both. The underlying abnormality may be present at birth or may become evident as the patient grows and develops or may be the result of traumatic injuries. The severity of these deformities precludes adequate treatment through dental treatment alone (AAOMS).

Overbite: Vertical overlap of maxillary teeth over mandibular anterior teeth, usually measured perpendicular to the occlusal plane (AAO).

Retraction: Pertaining to desired posteriorly directed, orthodontic or orthopedic displacements of teeth or of bones of the face (AAO).

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D7280	Exposure of an unerupted tooth
D7282	Mobilization of erupted or malpositioned tooth to aid eruption
D7283	Placement of device to facilitate eruption of impacted tooth
D7292	Placement of temporary anchorage device [screw retained plate] requiring flap; includes device removal
D7293	Placement of temporary anchorage device requiring flap; includes device removal
D7294	Placement of temporary anchorage device without flap; includes device removal
D7296	Corticotomy – one to three teeth or tooth spaces, per quadrant
D7297	Corticotomy – four or more teeth or tooth spaces, per quadrant
D7997	Appliance removal (not by dentist who placed appliance), includes removal of archbar

CPT Code	Description
41899	Unlisted procedure, dentoalveolar structures

Description of Services

Temporary anchorage devices (TADs) are used to improve anchorage during routine orthodontic therapy. They are gaining popularity and can allow better anchorage than extraoral headgear which relies on significant patient compliance for success. TAD's may also be used for distraction osteogenesis of the mandible and this use is medical in nature and typically covered under the member's medical plan. Impacted teeth are those that are not expected to erupt into their normal position within the dental arch. The most common impactions occur with third molars and maxillary canine teeth but may involve any teeth. If impacted teeth (other than third molars, primary or supernumerary teeth) are exposed early and there is no tooth size or arch length discrepancies, these teeth will often erupt on their own. However, these teeth may require surgery to expose the tooth and place a bracket, band or other device on the unerupted tooth, after its exposure, to aid eruption. Corticotomy in this context is a relatively new surgical procedure that involves creating cuts in, or removal of alveolar bone for the purpose of accelerating orthodontic treatment.

Clinical Evidence

Temporary Anchorage Devices (TADs)

Antoszewska-Smith et al (2017) conducted a systematic review and meta- analysis to compare the effectiveness of orthodontic miniscrew implants-temporary intraoral skeletal anchorage devices (TISADs)-in anchorage reinforcement during en-masse retraction in relation to conventional methods of anchorage. A search of PubMed, Embase, Cochrane Central Register of Controlled Trials and Web of Science were performed. Relevant articles were assessed for quality according to Cochrane

guidelines and the data extracted for statistical analysis. A metaanalysis of raw mean differences concerning anchorage loss, tipping of molars, retraction of incisors, tipping of incisors, and treatment duration was carried out. 14 articles including 616 patients were selected as meting criteria for detailed analysis, and the quality of the studies was assessed as moderate. Meta-analysis showed that use of TISADs facilitates better anchorage reinforcement compared with conventional methods. On average, TISADs enabled 1.86 mm more anchorage preservation than did conventional methods. The authors concluded that TISADs are more effective than conventional methods of anchorage reinforcement. The average difference of almost 2 mm seems not only statistically but also clinically significant. However, the results should be interpreted with caution because of the moderate quality of the included studies. More high-quality studies on this issue are necessary to enable drawing more reliable conclusions.

Heravi et al (2016) conducted a study evaluating the movement of impacted canines away from the roots of neighboring teeth before full-mouth bracket placement, performed by means of TADs to decrease undesired side effects on adjacent teeth. The study sample consisted of 34 palatally impacted canines, 19 in the experimental group and 15 in the control group. In the experimental group, before placement of brackets, the impacted canine was erupted by means of miniscrews. In the control group, after initiation of comprehensive orthodontics, canine disimpaction was performed by means of a cantilever spring soldered to a palatal bar. At the end of treatment, volume of lateral incisors and canine root resorption were measured and compared by means of a CBCT-derived tridimensional model. Visual Analogue Scale (VAS) score, bleeding on probing (BOP) and gingival index (GI) were recorded. Clinical success rate was also calculated. The volume of root resorption of lateral teeth in the control group was significantly greater than in the experimental group ($p < 0.001$). At the end of treatment, VAS score, GI and BOP were not significantly different between the two groups. From this study, the authors concluded that disimpaction of canines and moving them to the arch can be done successfully carried out with minimal side effects by means of skeletal anchorage.

Manni et al (2016) conducted a study with the aim of evaluating the effectiveness of the treatment of skeletal Class II malocclusions with an acrylic splint Herbst appliance anchored to miniscrews with 2 types of ligation. Sixty patients (mean age, 11.6 years; SD, 1.9) with a bilateral Angle Class II Division 1 malocclusion were retrospectively selected and divided into 3 homogeneous and balanced groups on the basis of the Herbst anchorage used: without anchorage, miniscrews with elastic chains, and miniscrews with metallic ligatures. A cephalometric sagittal occlusion analysis merged with mandibular incisor proclination and skeletal divergence was carried out before and after treatment. To compare the absolute variations within and among the groups, we performed the 1-sample t test for repeated measures and 1-way analysis of variance, respectively. The results showed overjet was reduced similarly in all groups, the mandibular bone base length increased in the group with elastic chains only , and the change in the distance between Point A and pogonion showed the most reduction in the group with elastic chains ($P <0.05$). Incisive flaring was more pronounced in the group with no anchorage than in the group with elastic chains ($P <0.001$) and the group with metallic ligatures ($P = 0.003$). The authors concluded that anchorage to miniscrews with elastic chains increases the orthopedic effect of the acrylic splint Herbst appliance and confirmed that skeletal anchorage reduces incisor flaring.

Turkkahraman et al (2016) conducted a controlled study to evaluate the effects of temporary anchorage devices (TADs) in the treatment of skeletal open bites and to compare the results with untreated controls. A total of forty patients with skeletal anterior open bites were assigned to two groups of twenty each. Titanium miniplates fixed bilaterally to the infrazygomatic crest area were used as TADs and intrusive forces were applied to the posterior teeth with Ni-Ti coil springs. The treatment and normal growth changes were evaluated using 24 measurements (2 angular, 22 linear) with statistically significant differences found between the groups in several of them. In the treatment group, statistically significant upper molar intrusion, posterior rotation of the occlusal plane, anterior rotation of the mandible, and resultant overbite improvement were found. The authors concluded that mild to moderate skeletal anterior open bites could easily be treated with TADs without orthognathic surgery. With the rigid anchorage of miniplates, true molar intrusion of up to 4 mm was achieved. With molar intrusion, anterior rotation of the mandible and a significant reduction in anterior face height were determined.

Lee et al (2015) conducted a clinical study to compare the treatment duration and dentoskeletal changes between two different anchorage systems used to treat maxillary dentoalveolar protrusion and to examine the effectiveness of en-masse retraction using two miniscrews placed in the midpalatal suture. Fifty-seven patients were divided into two groups according to the method of maxillary posterior anchorage reinforcement: midpalatal miniscrews (25 patients, mean age 22 years) and conventional anchorage (32 patients, mean age 19 years). The en-masse retraction period, overall treatment duration, pre-treatment effective ANB angle, and change in the effective ANB angle were compared with an independent-samples t-test. Compared to the headgear group, the duration of en-masse retraction was longer by approximately 4 months in the miniscrew

group ($p < 0.001$). However, we found no significant difference in the total treatment duration between the groups. Moreover, a greater change in the effective ANB angle was observed in patients treated with miniscrews than in those treated with the conventional method ($p < 0.05$). The authors concluded that treatment using miniscrews placed in the midpalatal area will allow orthodontists more time to control the anterior teeth during en-masse retraction, without increasing the total treatment duration. Furthermore, it achieves better dentoskeletal control than does the conventional anchorage method, thereby improving the quality of the treatment results.

Bechtold et al (2013) conducted a study to determine the effects of linear force vector(s) from interradicular miniscrews on the distalization pattern of the maxillary arch in adult Class II patients. Twenty-five adult patients with mild to moderate Class II dentition and minimal crowding were collected. Either single (group A) or dual (group B) miniscrews were inserted on the posterior interradicular area to deliver a distalizing force to the main archwire. The displacement patterns of maxillary incisors and molars were measured and compared. Significant distalization in the molars and incisors was shown in both groups. Significantly greater distalization and intrusion of the first molar and intrusive displacement of the incisor, together with significant reduction of the mandibular plane, were noted in group B, in contrast to the rotation of the occlusal plane in group A. The authors concluded that interradicular miniscrews predictably induced total arch distalization, leading to the correction of Class II. Additional miniscrews in the premolar area appear to facilitate intrusion and distalization of the entire arch according to the position of the force vectors.

Xun et al (2013) The aim of this retrospective study was to quantitatively evaluate the treatment effects of intrusion of overerupted maxillary molars using miniscrew implant anchorage and to investigate the apical root resorption after molar intrusion. The subjects included 30 patients whose average ages were 35.5±9.0 years. All patients had received intrusion treatments for overerupted maxillary molars with miniscrew anchorage. There were 38 maxillary first molars and 26 maxillary second molars to be intruded. Two miniscrews were inserted in the buccal and palatal alveolar bone mesial to the overerupted molar. Force of 100-150 g was applied by the elastic chains between screw head and attachment on each side. Lateral cephalograms and panoramic radiographs taken before and after intrusion were used to evaluate dental changes and root resorption of molars. Only 6 of the 128 miniscrews failed. The first and second molars were significantly intruded by averages of 3.4 mm and 3.1 mm respectively ($P<0.001$). The average intrusion time was more than 6 months. The crown of the molars mesially tilted by averages of 3.1 degrees and 3.3 degrees ($P<0.001$) for first and second molars. The amounts of root resorption were 0.2-0.4 mm on average. The intrusion treatment of overerupted molars with miniscrew anchorages could be used as an efficient and reliable method to recover lost restoration space for prosthesis. Radiographically speaking, root resorption of molars was not clinically significant after application of intrusive forces of 200 to 300 g.

Corticotomy

Apilaomva et al. (2020) conducted a systematic review to evaluate corticotomies effects to accelerate or facilitate dental movements in different kind of orthodontic treatments. Seven randomized controlled clinical trials and two were controlled clinical trials were included in the review. In the selected studies the effectiveness of conventional orthodontic treatment was compared with orthodontics assisted by corticotomy or piezocisión. The effect of bone grafts was also evaluated. Variables such as tooth movement, treatment time, bone density and root resorption were studied as well. The methodological quality and evidence of the selected studies was low. Most of the studies observed a statistically significant increase in the rate of dental movement, when performing alveolar corticotomies as an aid in orthodontic treatment; either with the conventional technique or with piezocision. The effect of combining corticotomy with bone grafts was assessed. Corticotomy procedures performed even with conventional methods or piezocision involve a rate increase in dental movement and acceleration during the first months, subsequently returning to baseline values. Bone density may increase as a result of concurrent placement of bone grafting materials during corticotomy procedure. High heterogeneity among studies made it difficult to draw clear conclusions. However, within the limitations of this review, the corticotomy procedures were able to statistically and clinically produce significant temporary decrease in orthodontic tooth movement rate. The available literature about orthodontics facilitated by corticotomy techniques provides low quality evidence, which is why more research is needed. A research with less risk of bias would allow greater comparisons and more significant conclusions.

In a 2018 systematic review, Gil et al. aimed to provide scientific support to validate alveolar corticotomies as a reliable approach to accelerated orthodontics. Three randomized clinical trials, 2 prospective randomized clinical trials, 6 case series and 1 randomized controlled split-mouth study were included. No clinical trials were retrieved. The results showed the mean total treatment time in corticotomy-facilitated orthodontic cases was 8.85 months; control groups treatment duration was 16.4 months. Complications such as pain, swelling, and dentin hypersensitivity were reported. Few studies mentioned patient/clinician satisfaction. The faster and less invasive procedures appeared to be well tolerated. However, the

methodological quality of the selected studies was low, with only low to moderate scientific evidence. The authors concluded that corticotomy-facilitated orthodontics resulted in decreased treatment time. Few complications and low morbidity were found. More solid evidence-based research is required to support these results.

Ji et al. (2017) conducted a study to summarize published systematic reviews (SRs) that assess the effects of adjunctive interventions on the acceleration of orthodontic tooth movement (OTM). Electronic and manual searches were performed up to August 2016. Systematic reviews investigating the impact of adjunctive techniques on the promotion of OTM were included. A total of 11 SRs were included in this study. The results showed the quality of evidence ranged from very low to low. The short-term (1-3 months) effects of low-level laser therapy and corticotomy were supported by low-quality evidence. The evidence regarding the efficacy of photobiomodulation, pulsed electromagnetic field, interseptal bone reduction, two vibrational devices (Tooth Masseuse and Orthoaccel) and electrical current was of very low quality. Relaxin injections and extracorporeal shock waves were reported to have no impact on OTM according to low- and very low-quality evidence, respectively. Based on currently available information, the authors conclude that low-quality evidence indicates that LLLT and corticotomy are effective to promote OTM in the short term. Future high-quality trials are required to determine the optimal protocols, as well as the long-term effects of LLLT and corticotomy, before warranting recommendations for orthodontics clinics.

Patterson et al. (2016) conducted a systematic review and meta-analysis to examine the evidence for the effectiveness and safety of corticotomy-facilitated orthodontics. Electronic databases were searched for articles that examined the rate of corticotomy-facilitated orthodontic tooth movement and its effects on the periodontium, root resorption, and tooth vitality. Unpublished literature was searched electronically through ClinicalTrials.gov and the ISRCTN registry. Relevant orthodontic journals and reference lists also were checked for eligible studies. Randomized clinical trials (RCTs) and controlled clinical trials (CCTs) were considered. Two article reviewers independently assessed the search results, screened the relevant articles, performed data extraction, and evaluated the methodologic quality of the studies. Fourteen eligible articles (6 RCTs and 8 CCTs) were included in this review. The results showed that there was a statistically meaningful increase in the rate of tooth movement compared with controls for all corticotomy techniques assessed. Some studies reported that acceleration in tooth movement was only temporary (lasting a few months). Corticotomy procedures did not seem to produce unwanted adverse effects on the periodontium, root resorption, and tooth vitality. The quality of the body of evidence was regarded as low owing to the presence of multiple methodologic issues, high risks of bias, and heterogeneity in the included articles. The authors concluded that corticotomy procedures can produce statistically and clinically meaningful temporary increases in the rate of orthodontic tooth movement with minimal side-effects. Additional high-quality randomized clinical trials are needed to allow more definitive conclusions.

Hassan et al. (2015) conducted a systematic review the literature to assess the quality of evidence related to corticotomy-assisted orthodontic treatment (CAOT) as adjunctive treatment in orthodontics. The study was conducted in the Faculty of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia between 2013 and 2014. Various electronic databases were searched, and abstracts were retrieved. Defined inclusion criteria included human or animal studies that assessed aspects of CAOT and/or the biological principles behind it. The quality of the studies was evaluated by the methodological score for clinical trials developed. 12 articles were selected for the study. The CAOT was found to accelerate tooth movement by 2-2.5 folds when compared with conventional orthodontic tooth movement. The CAOT was found safe on periodontal health and exhibits no or little risk of root resorption. A localized turnover of alveolar spongiosa and the absence of a hyalinized zone was the acceptable biological explanation of CAOT. There is no evidence to support that CAOT enhances the movement of ankylosed teeth, closing old extraction sites, post-orthodontic stability, or transverse expansion. There were several serious defects identified by the authors and included study design in combination with small sample size that was not predetermined, absence of blinding, reliability assessment, and the indication of drop out. The authors concluded that corticotomy-assisted orthodontic treatment should be considered with caution, and long term randomized clinical trials are still needed.

Professional Societies

American Association of Oral and Maxillofacial Surgeons (AAOMS)

In a 2017 Parameter of Care, AAOMS indicates that due to the added advantages of lower costs and morbidity, fast recovery, and decreased duration of orthodontic therapy and decompensation, surgically assisted osteogenic orthodontics (SAOO) may be considered as a treatment option when clinically indicated for pediatric patients requiring distraction osteogenesis orthognathic surgery.

In the same parameter of care, the AAOMS states that mandibular retrusion and maxillary protraction utilizing temporary anchorage devices (TAD) such as screw retained plating systems and miniscrews may be considered as a more conservative, cost efficient, and less morbid treatment alternative to more complex orthognathic surgery for developing skeletal class III malocclusion in pre-and early adolescents.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Temporary anchorage devices are FDA approved for use in patients aged 12 years and older. There are an extensive number of manufacturers of these devices. See the following website for more information and search by specific product name: http://www.fda.gov/MedicalDevices/default.htm. (Accessed July 8,2020)

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Policy History/Revision Information

Date	Summary of Changes
03/15/2021	• Updated dental entity brand logo
01/01/2021	Template Update • Reformatted policy; transferred content to new template
09/01/2020	Supporting Information • Updated *Clinical Evidence* and *References* sections to reflect the most current information • Archived policy version DCP032.06

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting UnitedHealthcare standard dental benefit plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. UnitedHealthcare reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.