

SURGICAL UPRIGHTING

The greatest advantage to surgical uprighting of a tooth has to do with time savings. Uncovering a tooth to achieve the correct tooth position in the classical manner can take several years. The more aberrant the tooth location, the longer it takes. The idea of saving multiple years of treatment time through a one hour procedure is not only helpful in reducing damage to adjacent teeth and the risk for caries in patients who have trouble cleaning around their orthodontic brackets, but also reduces the potential social burden of wearing appliances for many years for those who are sensitive.

Of course, the more unusual the tooth position, the more risk there is that the tooth may not be accessible even with surgery because of nearby vital structures such as the inferior alveolar canal or maxillary sinus, or because of malformation of the tooth because of adjacent teeth or other anatomy.

There are two types of surgical uprighting depending on the location of the tooth. If the tooth is near enough to its correct location, the tooth may only need luxation and repositioning without extraction thus reducing the potential trauma to the tooth in terms of damage to the PDL or pulp. In other situations, and by taking advantage of developing root structures, auto-transplantation can be used not only to bring the tooth to its approximate location, but also to regenerate missing alveolar bone.

All cases are patients of Dr. Pamela Nicoara unless otherwise specified.

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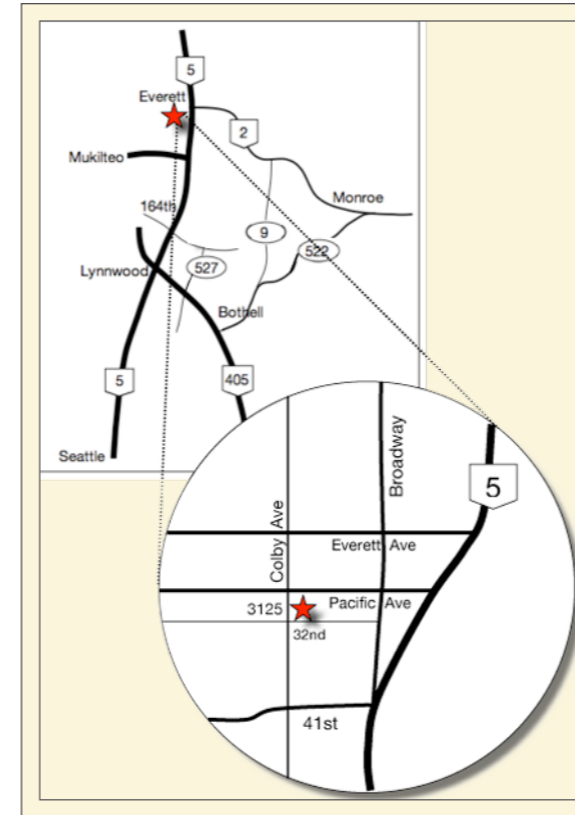
TOOTH IMPACTION: CAUSES AND TYPES

Teeth may remain impacted in the mouth for several reasons, the most common of which is genetics. The teeth most likely to be impacted in order of predilection are mandibular third molars, followed by maxillary 3rds, maxillary canines, mandibular then maxillary 2nd premolars, and finally mandibular canines. Besides the esthetic problem when a tooth is not present, there are form and functional issues as well. The lack of normal eruption of teeth leads to deformities in the alveolus, and poor eruption position of the adjacent teeth. This can lead to significant malocclusion or mucogingival problems.

When a tooth is not erupting in the expected time frame, a decision needs to be made if the tooth can be utilized or not. If a tooth can be uncovered and moved into the correct position, then orthodontics is involved to help achieve the desired goal. Sometimes it is apparent quite early in development that the position of the developing tooth is so far from its normal eruption path, that it is not worth the time or the effort, particularly due to a high risk of damage to adjacent teeth, to attempt to uncover and orthodontically move the tooth into an appropriate site in the arch in a traditional fashion. As an alternative, it is possible to move the tooth surgically to create an instant orthodontic change in tooth position. This issue of **ProbeTips** will review tooth uncovering through surgical uprighting, as well as a comparison to traditional techniques.

Pamela A Nicoara DDS MSD PLLC

PERIODONTOLOGY IMPLANTOLOGY ORAL MEDICINE



3125 Colby Avenue, Suite H
Everett WA 98201
T: 425-374-5380 F: 425-374-5382

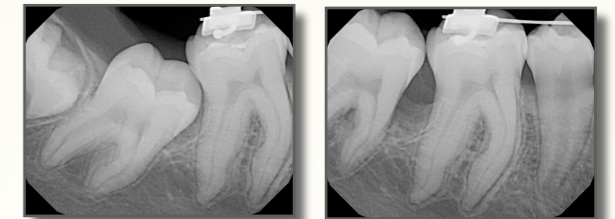
www.NICOARaperio.com
doctor@NICOARaperio.com

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BY PAMELA NICOARA DDS MSD

Surgical Tooth Uprighting



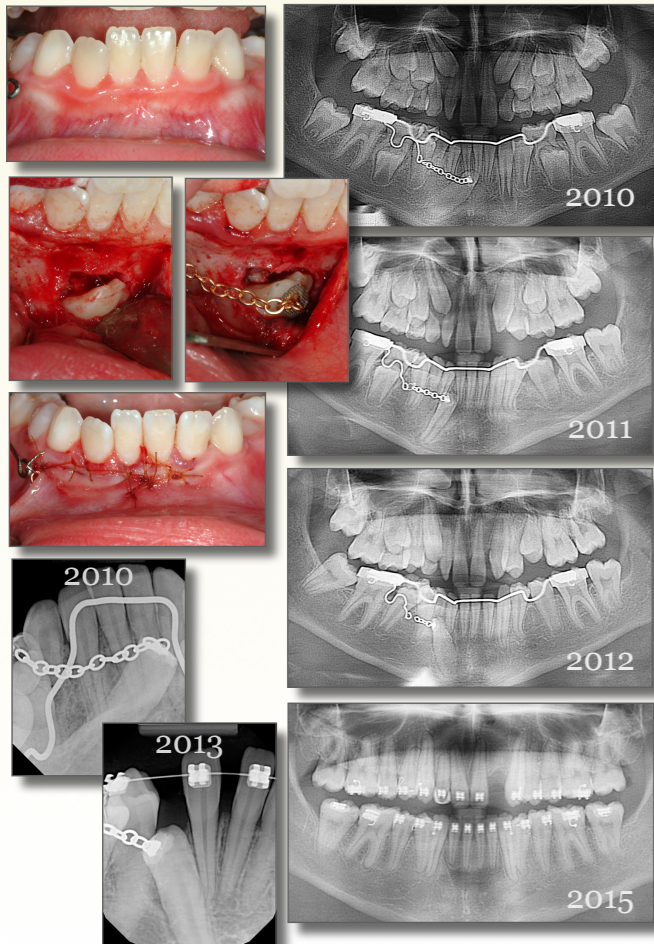
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CASE 1: TRADITIONAL TOOTH UNCOVERING

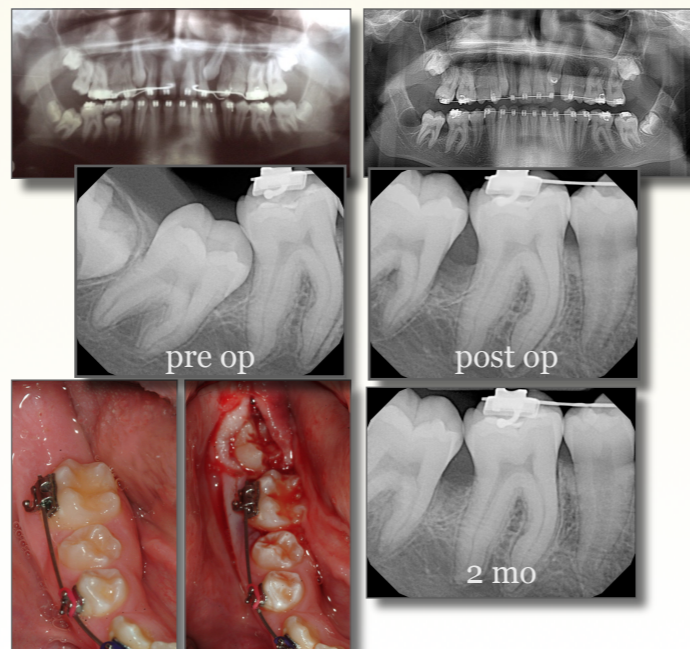
The case below demonstrates access of a mandibular canine that is positioned apical to the mandibular central incisors in a nearly horizontal position. A gold chain was attached, and the tooth slowly and carefully moved into position taking care not to damage the adjacent tooth roots. The uncovering surgery was performed in 2010, and orthodontic treatment is still in progress, although nearly completed.



CASE 2: SURGICAL TOOTH UPRIGHTING

For a situation where a molar crown is 'caught' under the CEJ and distal bulge of the tooth anterior to it, a relatively non-invasive means of surgical uprighting is possible. In this case, tooth #31 is 'trapped' behind tooth #30. It will not erupt on its own. The tooth can be exposed and a chain placed on it, but difficult orthodontic mechanics are necessary to move the tooth into the correct orientation.

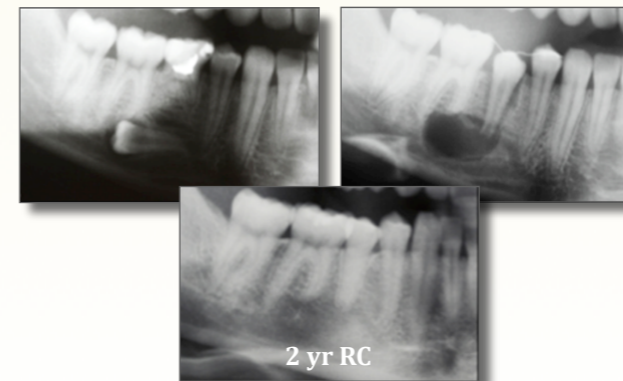
Alternatively, the tooth was luxated coronally to rest on the distal contact of tooth #30 while the third molar was removed at the same time. Within a matter of weeks, the wedge shaped defect on the mesial of tooth #31 begins to fill in. The biggest risk is damage to the PDL during luxation resulting in possible root resorption, or damage to the pulp leading to tooth necrosis. There have been no negative outcomes in this case.



CASE 3: AUTOTRANSPLANTATION

When it is possible to take advantage of an immature root stage, surgically uprighting a tooth in the alveolus can be utilized in more extreme situations (such as the first case) where orthodontic treatment would not be possible or would be very complicated or time consuming. In these types of autotransplantation cases, the recipient site is oversized because the donor tooth needs adequate bone removal to allow extraction of the tooth without damaging the immature root and follicle since ideal candidates should have roots 2/3 to 3/4 in length. This will often require more stabilization than other types of transplantation, with non-rigid fixation up to 4 weeks.

In addition, because of the malposition of the tooth to be uprighted, the tooth may be malformed because of proximity to other structures such as adjacent teeth or the inferior alveolar canal which limit its normal development. CBCT is an excellent tool to visualize dilacerated roots in particular which may be severe enough to prevent use of the tooth as a transplant.



Images from article:
AJODO 2013, Plakwicz, P **

The biggest risks to the tooth to be autotransplanted are incomplete root formation or malformation, obliteration of pulp space, root resorption, or pulp necrosis.

SUMMARY

Despite the risk of root resorption, which is greater for autotransplantation than it is for orthodontic tooth movement, the risk is low when the case is carefully selected in terms of ideal root formation, and carefully executed with regard to delicate management of the periodontal and pulpal structures. Root resorption and pulp necrosis can also occur with orthodontic tooth movement, particularly in the more difficult cases. So the advantages with surgical uprighting with regard to reduced treatment time in particular may outweigh the risks.

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