Molar Intrusion Using TADs: The Key Element to Correcting Anterior Open Bite and/or Vertical Excess Problems

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1. Two Types of Vertical Excess

Because the treatment approach is different, it is recommended to classify ‘vertical excess’ into 2 types, which are the ‘vertical excess with anterior open bite’ and ‘vertical excess with normal anterior overbite’.

a) Vertical excess with anterior open bite

Molar intrusion itself is enough for correcting the vertical excess with anterior open bite, because the opened anterior teeth will be automatically seated down by the closure of the mandibular plane.

Anterior open bite is nothing but a state in which the upper and lower molars hit first in mandibular closure (Case DK)

Therefore, molar intrusion automatically closes the anterior open bite. 1 mm molar intrusion will close 2-3 mm overbite in the anterior teeth (Case DK)
Molar intrusion induces traumatic anterior bite in patients with normal overbite. To solve this problem, intrusion of both the molars and anterior teeth is necessary, eventually resulting in total intrusion of the whole dentition. This phenomenon can be named “slow impaction”, because the result is achieved orthodontically and yet similar to that of the impaction osteotomy surgery.

**b) Vertical excess with normal anterior overbite**

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**Case SK**

**SLOW IMPACTION of the whole dentition**

Because the anterior bite was normal initially, the incisor contact has become heavier with the intrusion of the molar teeth.

Continuous insertion of accentuated curve of Spee (sliding mechanics) or strong Gable bend (loop mechanics) is usually needed to solve this problem. -> eventually total intrusion of the whole dentition has resulted.
2. **Which side should you intrude? Upper, lower or both?**

Because of the efficiency and stability, upper molar intrusion using mid-palatal TAD is usually preferred. However, lower molar intrusion should be considered in several situations listed in the following figure. Double intrusion is treatment of choice in the more severe cases where maximal closure of the mandibular plane angle is needed.

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**Q: If you want to intrude the molars; which side should you intrude?**

A > Usually, Maxilla

- because of the stability & convenience of the miniscrew fixation

B-1 > Steep Occlusal Plane Angle; Mandible

steepening the bite occlusal plane further, it might interfere the balance among the incisel, cuspal and condylar guidance

B-2 > Lack of Incisor showing; Mandible

better to intrude lower molars to preserve upper incisor display in the patients with insufficient amount of upper incisor showing

B-3 > Lack of sufficient overjet; Mandible

for the simultaneous reduction of the lower dentition and intrusion of lower molars subsequent to counter-clockwise rotation of the mandible

C > Severe cases where maximal closure of the mandibular plane angle is needed; Double intrusion

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**Tx. of Choice for Vertical Excess with Normal Bite**

**Total intrusion of the whole dentition**

(Molar intrusion by TAD, anterior teeth intrusion by ACOS or Gable bend)
3. **Controlling the occlusal plane and the mandibular plane**

Do you believe in dento-facial orthopedics in growing patients? I do. Even for some adults, certain amount of dento-facial orthopedics is possible through the changes of both the occlusal plane and the mandibular plane. Changing the occlusal plane and the mandibular plane angle not only help to correct skeletal discrepancy, but maximize the esthetics of the face and the dentition.

![Clockwise rotation of both planes](Clockwise rotation of both planes)
- For Low angle, lack of incisor showing case -

![Counter-clockwise rotation of both planes](Counter-clockwise rotation of both planes)
- For High angle, vertical excess case -

4. **Synergic effect of TAD, muscle training and extraction of 3rd molars**

Sometimes, for the severe open bite patient with vertical excess having minimal volume of masseter muscle, muscle training instruction can be beneficial. Also, extraction of 3rd molars can be added to the extraction of bicuspids. Closure of the mandibular plane angle induced by TAD-driven molar intrusion will increase the efficiency of the muscle training (clenching exercise), because the direction of bite force became closer to the tooth axis.

![After closing of the mandibular plane angle, direction of the bite force became closer to the tooth axis, which could reduce the extrusion (relapse).](After closing of the mandibular plane angle, direction of the bite force became closer to the tooth axis, which could reduce the extrusion (relapse).
5. **How to intrude the upper and lower molars efficiently?**

Synergic effect of TAD driven molar intrusion, muscle training and extraction of both the bicuspids and the 3rd molars.

Usually, upper molars are intruded using mid-palatal TAD and trans-palatal arch formed with thicker wire to resist lingual dumping of the upper molars.

For intruding lower molars, an elastomer can be connected to the buccal TAD and the wire. This photo shows the simultaneous A-P retraction and vertical intrusion from a single buccal TAD.
6. **Long term retention record of TAD-driven molar intrusion**

It is difficult to make a concluding remark on the relapse of the intrusion of molars attained using TAD. It is difficult to find a well reported research due to the shortage of the long-term records in this field. 10 year retention records of a patient presented in the textbook “Orthodontic Miniscrew Implants” published by Mosby/Elsevier is as follows;

10 year retention records of CASE 7.3 presented in page 175 in the textbook “Orthodontic Miniscrew Implants” published by Mosby/Elsevier is as follows.....

Textbook Case 7.3  Initial records taken on 10\textsuperscript{th} Feb 2001

Textbook Case 7.3  Post-tx records taken on 7\textsuperscript{th} June 2002
Textbook Case 7.3  “10 year retention” records taken on 22nd Jan 2013

References:


