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Case report
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Orthodontic Case Report

Dr. Gabriele Floria DDS

The impaction of maxillary permanent canines is a delicate problem for both its functional and aesthetic implications. It requires the coollaboration of the oral surgeon, the ort hodontist and the periodontist.
When there is a palatal bilateral impaction and the patient is an adult, various factors which influence our clinical decisions must be considered.
A good clinical and radiographic examinations are essential to reach an accurate diagnosis.

Clinical Evaluation: Signs and symptoms

Signs[(1)]:

- 1. Delayed eruption of the permanent canine with or without prolonged retention of decidous canine
- 2. Absence of a normal canine bulge to the intraoral palpation
- 3. Presence of a palatal bulge noted to the intraoral palpation
- 4. Distal migration of lateral incisors, distal tipping spaces between the incisors, rotations and deviation of interincisive line if unilateral impaction.

The absence of the canine bulge at earlier ages should not be consider indicative of canine impaction [(2)].

Symptoms

Shafer et al.[(3)] also consider canine impaction to be responsible for:

- 1. Dentigerous cyst formation
- 2. External root resorption of impacted tooth, as well as the neighbouring teeth
- 3. Referred pain
- 4. Internal resorption

These sequelae may generate pain, but usually impaction of maxillary canine is completely asymptomatic.

Radiographic evaluation

The purpouse of a radiographic examination is:

- 1.To verify the presence of impacted teeth
- 2.To check the morphology and structure of the impacted teeth
- 3.To make sure there are no obstacles to orthodontic disimpaction
- 4.To locate the impacted teeth exactly

Various radiographic exposures, occlusal films, panoramic views, lateral cephalograms, periapical films and tomography can be used. The first examination should be the orthopantomograpy because it gives us the most information.

Moreover putting the orthopantomogram on the diaphanoscope, making a slide of the area involved, and transferring it on photo CD (Kodak system) a digitized high resolution computer image can be obtained.

The computer also help us in comparing the dimensions of the impacted tooth with the corresponding one should it be present, in order to establish whether the impacted tooth is lingual or buccal. Since the X-ray moves in a straight line, if the impacted tooth is buccal its image will be bigger than the controlateral canine.

The enlargement of the radiological image is also important to verify the absence of ankylosis, in which case the orthodontic treatment may be very difficult or impossible.

Radiographically the ankylosis can be defined as the absence of a periodontal ligament (radiolucent line) which is a sign of the fusion of cement with alveolar bone [(4)].

If the panoramic view doesn't give us sufficient information about the tooth location a periapical films following Clark's rule (tube shift) can be used. In this technique the orizontal angulation of the cone is changed when the second film is taken. If the tooth moves in the same direction as the cone, it is lingually positioned, otherwise it is buccally located.

Treatment plan

There are several treatment options:

- **1. No orthodontic treatment:**especially when we have removed the obstacles to a spontaneous eruption (like a dentigerous cyst) or a sovrannumerary tooth.
- **2. Extraction** of the impacted canine and movement of the first premolars into this position
- **3. Prosthetic replacement**
- **4. Surgical exposure and orthodontic treatment** to disimpact the canine and align it in the arch.

This last option is obviosly the most desirable situation.

Caso Clinico

A 30 year-old male, heavy smoker,(fig.1) was referred to the orthodontist by his family dentist.

The clinical examination showed the presence of the left deciduos canine, and distal migration of lateral and central incisors.

The absence of a canine bulge and the presence of a bilateral palatal bulge were noted upon intraoral palpation.

There were no symptoms.

Panoramic radiographs showed the presence of two impacted canines (fig.2). Considering the good morphology of the teeth, the position and the absence of ankylosis, in agreement with the oral surgeon the surgical-orthodontic disimpaction was decided. A fixed superior ceramic appliance was applied.

The oral surgeon performed the surgical exposure of the impacted teeth and the orthodontist attached an auxilliary button directly to the crown's enamel on the palatal side.

This one-step approach is preferable, and to assure good bonding to the enamel the exposure should be the least traumatic possible. A fibrine sponge is useful to reduce the bleeding around the crown, and a pariodontal curette can be used to remove the primary cuticle

from the enamel. An orthophosphoric acid (37 %) was used for 40 second and the button was bonded. A ligature with several holes was prepared and attached to the button before bonding (fig.3).

The surgical exposure was very conservative. Only the bony tissue over the crown was excised and the flap completely sutured.

We consider this light surgical exposure to be beneficial to the future periodontal health. After a week the suture and the surgical dressing were removed, and light orthodontic force (no more 60 grams/2 ounces) with elastic ligatures was started.

Concurrently sufficient space was created in the arch thus reducing the diastema. A preformed round arch wire 0.020 was used to provide sufficient stiffness.

During the treatment two endoral radiographs were made on each side to ensure that the movement of canine was not damaging the roots of the neighbouring teeth.

When the crowns were erupted a metallic canine bracket was bonded, and the remaining movements were made with sectional, later repositioning the bracket twice. A Flexiloy tm (Unitek) * 0.021 X 0.025 was the finishing arch and an Essix reteiner was used for retention.

The active treatment lasted 2 years and 2 months long.

Both the canines at the end of treatment had good periodontal conditions.

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Author

Dr. Gabriele Floria editor@vjo.it Tel./Fax. +39-055-572589

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