

RADIO “LOGICAL” REFLECTIONS

Idiopathic resorption?

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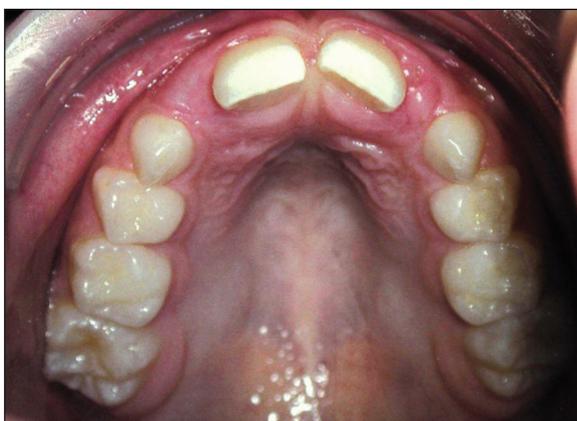
A CASE PRESENTATION

We have been following 13 year-old Jessica **since she was** 9 years old because of an arch length discrepancy with an Angle Class I relationship, on a thin periodontal biotype. Because of the severity of her mandibular crowding, we had discussed beginning a program of serial extractions (fig. 1 a and b).

Jessica demonstrated no particular signs of previous malfunctions, her breathing was

uniquely nasal, her swallowing was mature, and the absence of muscular signs and dental wear facets indicated there had never been periods of bruxism, nor were there any signs of pencil chewing or nail biting.

Her lingual frenum was short, which tended to keep her tongue in a low posture and her upper labial frenum was also in a low position causing a midline diastema. When we took an occlusal photograph, the



a



b

Figures 1 a and b

Intraoral views of the maxilla and mandible before treatment. Note the severe crowding of the mandibular incisors.

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frenum caused withering of the mucosa, a typical sign of insertion on the gingival papilla.

This young patient had never sucked her thumb or fingers and reported no history of even the slightest oral trauma. She was receiving no

medical treatment and was in excellent health.

The patient is now ready to begin treatment to align her teeth with the originally planned full banded and bonded appliance.

DESCRIPTION OF THE RADIOGRAPHIC RECORDS

Our X-ray file for Jessica contained three consecutive panoramic films, two lateral cephalograms, and sectional images taken with the cone beam technique.

Diagnostic documents

The panoramic film (fig. 1 c) shows clearly that all unerupted teeth are present with the exception of the buds of the third molars, which indicates a dental age of 8 or 9 year-old. The upper lateral incisors are slightly late in their eruption, and still quite incompletely formed and rotated in their axial positions.



Figure 1c
View at the beginning of treatment.

The buds of the lower canines are mesially inclined, the left quite strongly, and the buds of the upper canines are in a markedly high position.

The apex formation of the upper incisors is incomplete and the pulp chamber of the upper left central incisor appears to be enlarged.

The profile head film (fig. 1 d) showed that Jessica's upper airways



Figure 1 d
Profile cephalogram taken at the beginning of treatment. One can see the hypertrophied lymphoid tissue, which is normal at this age. The position of the incisors and the support they give the lips appear to be in balance.

were fully open, with adenoidal growth normal for her age, a harmonious cutaneous profile that allowed for ready spontaneous lip closure, and upper and lower incisors in good relationships.

Continuation of treatment (fig. 2)

After the temporary canines were extracted, the lateral incisors erupted into good alignment spontaneously. Our treatment plan called for removal of the first temporary molars and, later, the permanent first bicuspid, as soon as we had observed the canines had assumed a good position, and the presence of third molar buds had been confirmed. The crypts of the upper left third molar and both lower third molars can already be seen in the panoramic film depicted in figure 2. Although their roots are short, the apices of the upper central incisors have calcified. The upper lateral incisors appear to have a more normal morphology.

We put no anchorage in place because we did not want to get a lingual repositioning of the incisors.

Check-up visit before placement of a full banded and bonded appliance (fig. 3 a to d)

X-ray films taken at this time showed severe resorption of the roots of the maxillary central incisors even though the patient had worn neither removable nor fixed orthodontic appliances. These teeth responded positively to pulpal vitality tests, showed a blurred image of their roots on the panoramic film, and seemed to be definitely shortened and retroclined as viewed on the profile head film.

In view of the increased radiolucent quality of the premaxillary region, to rule out any possibility of a tumorous growth being responsible for the severe resorptions, panoramic and dento-axial reconstructions of the teeth were made from the cone beam radiographs (fig. 3 e and f).



Figure 2
View during treatment.



a



b

Figures 3 a and b

Maxillary and mandibular intraoral check-up photographs. Note how the incisor teeth got spontaneously aligned with a residual space left from the bicuspid extraction. On the right side these spaces are closing as the second molars are erupting. The lower incisors can be seen located near the buccal aspect of the mandibular symphysis with a thin gingiva.



Figure 3 c

Panoramic check-up film before placement of appliances.

They clearly demonstrate the severe resorption of the root of the upper right incisor (sections 22-24) and of the root of the upper left incisor (sections 30 to 33), both of which are jammed into cortical bone. In sections 22 and 31 one can make out the phantom outlines of the former root canal extending 2 to 3 mm beyond the existing blunted apex. The resorbed



Figure 3 d

Check-up profile cephalogram before placement of appliance.

roots have retained their rounded form, the gaps left by the resorption filled in by new bone formation analogous to the surrounding bone.

R A D I O " L O G I C A L " R E F L E C T I O N S

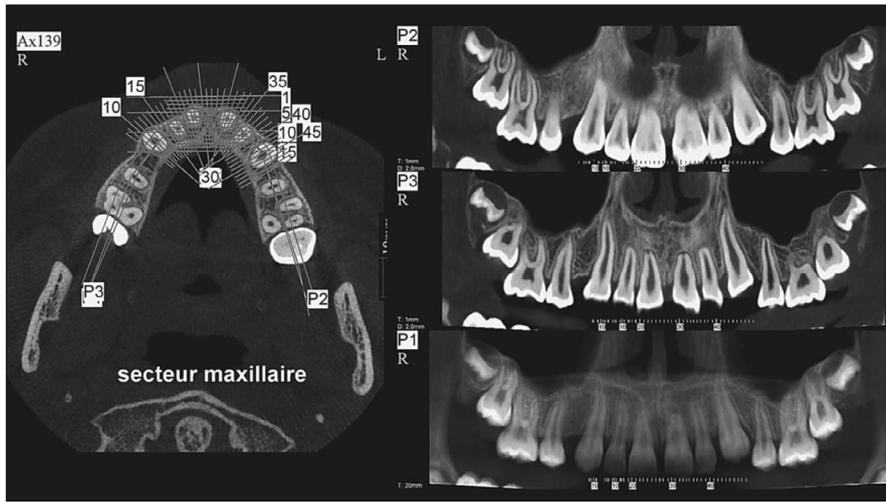


Figure 3 e

Reconstructions made with the cone beam technique: axial sections and curvilinear panoramic reconstructions.

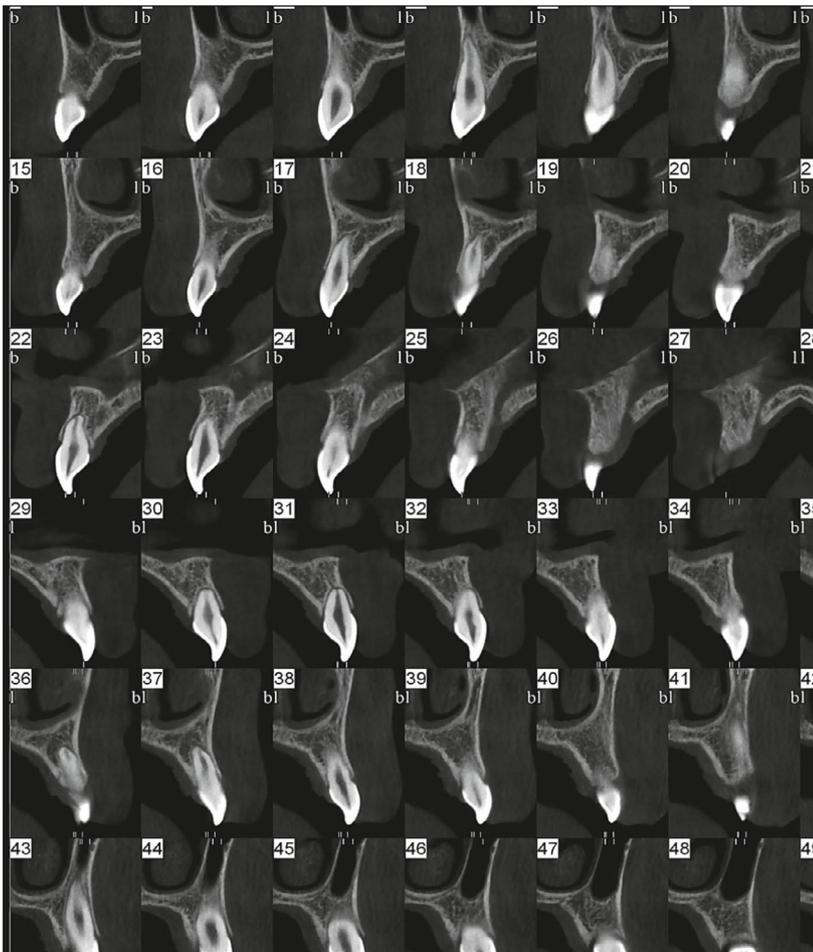


Figure 3 f
Axial reconstructions of the teeth.

WHAT DIAGNOSIS DOES THE DATA SUGGEST?

Both biological and mechanical factors influence the development of external root resorption, a frequently occurring phenomenon.

When the process destroys more than one third of the root it can be called severe. And when it appears on check-up X-rays films of patients who had displayed no clinical signs indicating its development, it causes grave concern to treating orthodontists.

In this patient the root/crown ratio was initially close to 1 to 1 (see the check-up X-ray taken just after the root apex had calcified) and now the crown is twice the size of the root, making this a case of extreme root resorption.

There are many known and localized causes for root resorption, none of which seemed to be relevant for this patient, unless the slightly atypical morphology of the central incisors can be considered an etiological factor.

The patient's general health was good with no indications of hormonal, allergic, inflammatory, or nutritional problems. Nor were there any difficulties with her phosphorous and calcium metabolism.

Locally, there were no signs of oral dysfunction or gingival inflammation. And even after our most persistent and inquisitive interview we could unearth no past history of oral trauma.

The mechanical factors associated with root resorption occurring during the course of orthodontic treatment are those that concentrate forces on

root apices through wide ranging tooth movement, application of root torque, and tooth intrusion. But this patient had never worn an orthodontic appliance. Only an anterior overbite, gradually developing concurrent with an increase in the lingual inclination of the incisor teeth could be considered an occlusal overload.

We asked ourselves a variety of questions about the etiology of these root resorptions. Had there been an old "forgotten" traumatic incident? Did this patient have some kind of genetic susceptibility? In taking medical histories of the child's parents we found that the mother had congenitally absent maxillary lateral incisors. But no clear etiological explanation emerged.

We could put a name on it, idiopathic resorption.

The adjective idiopathic comes from the Greek *idios*, which means, particular, specific and from another Greek word, *pathos*, from which we get pathology and other medical terms. *Pathos* is a synonym for suffering or accidental change. An idiopathic malady may occur in association with another disorder, or pathosis, but nevertheless has its own development and its own characteristics. In practical terms, it describes a disease entity whose causation is unknown and that would be more correctly described as *cryptogenic*.

WHAT STANCE SHOULD WE ADOPT IN REGARD TO THIS PROBLEM AND WHAT WOULD BE ITS EFFECT ON FUTURE ORTHODONTIC TREATMENT?

We have postponed beginning full banded and bonded finishing orthodontic treatment for this patient because of the risk of accelerating the pathological resorption process.

With the goal of lending support to Jessica's upper central incisors, which, by themselves bear the full burden of protrusive mandibular excursion movements (see fig. 4 a and b) and also to protect against possible eccentric nocturnal bruxism, we decided it would be prudent to construct a temporary occlusal splint for

her to wear at night, that would be slightly spaced in relation on the central incisors.

Even in cases of idiopathic resorptions, we can suspect a real etiological factor in the form of micro-trauma working on a predisposed site or of vaso-motor disturbances. With the splint, we hope we are protecting Jessica against these possible threats by giving her incisors respite against all inflammatory stimuli from pressure that could exacerbate her condition.



Figure 4 a
Frontal intraoral photograph of teeth in occlusion.



Figure 4 b
Intraoral photograph of the mandible in propulsion. The central incisors are the only teeth in contact.



Figure 4 c
"Decompression" splint for the upper central incisors.

No endodontic treatment is indicated.

Even though the affected teeth do not yet show any signs of worrisome mobility, we have informed the patient and her family that there is a risk of her losing her upper central incisors and that they will have to be replaced by implants at the end of her growth period.

Jessica has been keeping her check-up appointments faithfully and we are considering a future sectional treatment, assiduously avoiding the incisors, once her second molars have fully assumed their positions in the dental arches.

WORKS TO CONSULT

- Chouvin M. Relation entre phase de traitement, pulsion linguale et l'apparition des résorptions radiculaires. *Orthod Fr* 1995;66:559–566.
- Frapier L, Massif L, Leplus M, Chouvin M, Canal P. Conduite à tenir face aux résorptions radiculaires. *Rev Orthop Dento Faciale* 2007;41:295–309.
- Kjaer J. Morphological characteristics of dentitions developping excessive root resorption during orthodontic treatment. *Eur J Orthod* 1995;16:25–34.
- Samadet V. Entretien avec Pierre Machtou : à propos des résorptions radiculaires liées au traitement d'orthopédie dentofaciale. *Rev Orthop Dento Faciale* 2007;41:253–262.
- Samadet V, Bacon W. Les résorptions radiculaires : facteurs de risque et attitudes thérapeutiques. *Rev Orthop Dento Faciale* 2007;41:263–293.