
Incidental pathological finding during routine orthodontic treatment: a case report

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Lateral cephalograms and orthopantomograms (OPGs) are often taken prior to the commencement of orthodontic treatment to assist in diagnosis and treatment planning. Further radiographs may be taken during treatment to monitor progress. It is the responsibility of the practitioner to carefully and thoroughly assess all aspects of the radiographs, both orthodontic and non-orthodontic. In the case presented, a radiolucency in the right mandible was identified in a mid-treatment OPG. Following referral to an oral maxillofacial surgeon for opinion and management, the lesion was biopsied and a specimen sent for histological examination. This case highlights the need for the orthodontic clinician to assess not only the state of orthodontic treatment, but also the overall clinical presentation and any radiographs that may be taken.
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Introduction

Although a consensus has not been reached on the minimum record set required for orthodontic diagnosis and treatment planning,¹ many practitioners traditionally take dental models, facial and intraoral photographs and a series of two-dimensional radiographs. Following clinical assessment and appropriate interpretation of gathered records, further information might be obtained as needed.

During or at the end of treatment, records may also be acquired to assist in further management of the patient. Usually these are taken prior to appliance removal in order to verify the correct apical position of the teeth and to prescribe an appropriate retention regime.

Although the records are taken for orthodontic assessment, it is the duty of the requesting clinician to carefully assess all aspects of the records, particularly the radiographs, from both orthodontic and non-orthodontic perspectives.²

Bondemark et al.,³ in a study of 496 OPGs, noted 56 (8.7%) findings that were not related to orthodontic

treatment planning. Although, in the majority of the cases, the findings had no orthodontic consequence and did not require medical or dental management, it highlighted the clinician's role in the detection of pathology and abnormality.

Case report

A 14-year-old boy attended the Orthodontic Department at the University of Adelaide in January 2014 following referral from his general dentist. The primary concern was related to crooked lower front teeth. Study models, intra- and extra-oral photographs, a lateral cephalogram and an OPG were taken as part of routine record collection. A dental history showed that the 15 (upper right second premolar) had been extracted two years previously, due to palatal impaction. Other than routine six-monthly check-up appointments and oral hygiene measures, no further care was received. Medically, he was congenitally deaf in his left ear but otherwise healthy and motivated for treatment.

An extra-oral examination in conjunction with an



Figure 1. Pretreatment extra-oral photographs.



Figure 2. Pretreatment intraoral photographs.

assessment of the lateral cephalogram revealed a mesofacial, bimaxillary protrusive appearance on a Class I skeletal base. The lips were apart at rest and an acute nasolabial angle with prominent lips relative to Ricketts' E-plane was evident (Figure 1).

An intraoral examination revealed an edge-to-edge incisor relationship, moderate crowding in the lower arch and a well-aligned upper arch. The upper midline deviated to the right due to the early extraction of 15. The intra-arch dental relationships were also affected by the early extraction. The left side molar and canine relationships were Class I, whereas the right hand side molar relationship was a 3/4 unit Class II and the canine relationship was Class III. An anterior Bolton discrepancy of 0.8 mm mandibular excess was deemed within measurement error (Figure 2). The OPG and

lateral cephalogram showed no discernible pathology (Figures 3 and 4).

The treatment objectives were to correct the midlines, improve the alignment of the lower anterior teeth and achieve lip competency. To achieve these goals, the proposed treatment plan was to extract 24, 35 and 45 and treat with Tip-Edge fixed appliances. The



Figure 3. Pretreatment OPG.



Figure 4. Pretreatment lateral cephalogram.

referring general dentist reported that the extractions had been uncomplicated, following which, appliance treatment commenced in July 2014.

Treatment began with 0.016" stainless steel (SS), special plus wires (A. J. Wilcock, Victoria, Australia). Following initial alignment, careful application of super-thread and judicious elastic wear was used to correct the dental midlines. Treatment continued with 0.020" SS special plus wires (A. J. Wilcock, Victoria, Australia) before the placement of 0.0215" × 0.028" SS wires with nickel titanium underwires for root uprighting and torque.

In July 2015, at 50 weeks into treatment, the patient presented for a routine orthodontic adjustment appointment when it was noted that there was a small sinus present in the interdental area between 44 and 46 following space closure (Figure 5). The patient had not experienced any symptoms, probing depths around the 44 and 46 were 1–2 mm and both teeth responded vitally to a cold test and normally to percussion. Palpation around the area did not elicit any pain and there was no exudate from the sinus.

An OPG was requested to assess the area as well as determine root positioning of all teeth prior to appliance removal (Figure 6). A well circumscribed radiolucent lesion was identified between the 44 and 46 teeth. A periapical radiograph was also requested of

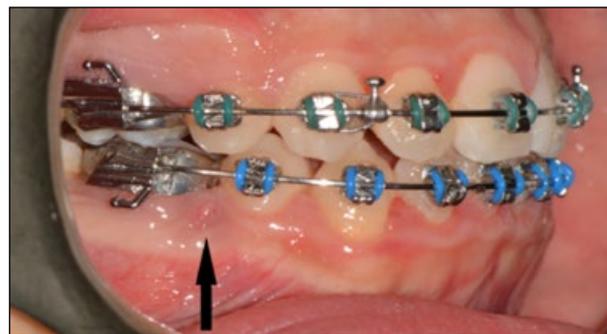


Figure 5. Fifty week progress photo of small fistula between 44 and 46.



Figure 6. Fifty week progress OPG – showing interdental radiolucency between 44 and 46.

the 44–46 area (Figure 7), following which a referral was made to the Oral and Maxillofacial Surgery department for assessment and management of the radiolucency noted on the radiographs.

An excisional biopsy was undertaken as the treatment of choice. Interestingly, on the day of the procedure and 14 weeks later, there were no intraoral signs, as the soft tissue fistula had completely resolved.

Upon raising a mucoperiosteal flap, the surgeon noted a thin buccal cortical plate and an area of shadowing beneath. The cortical plate was perforated and a tissue sample was collected for histological assessment. The lesion was completely curetted (Figure 8) before the flap was closed with resorbable sutures.



Figure 7. Fifty week progress periapical radiograph of 44–46 area.

A two-week review with the surgeons showed good signs of healing and, although the patient had experienced mild altered sensation of the lower right lip for one week post-operatively, complete resolution had taken place.



Figure 8. Intra-operative view of lesion.

The fixed appliances were removed in November 2015 following detailing and finishing of the occlusion (Figures 9 and 10). Good alignment of the upper and lower dental arches was achieved. Bilateral Class I canine and molar relationships were also achieved and the overbite and overjet were within normal limits. The dental and facial midlines were coincident. The patient's concerns were met and he and the parents were happy with the outcome of treatment. The overall treatment time was 68 weeks. Retention was managed using upper and lower vacuum-formed retainers.

Periodic orthodontic and surgical recall appointments were arranged and the six-month post-surgical periapical radiograph showed continued healing of the surgical site. The one-year post-surgical radiograph

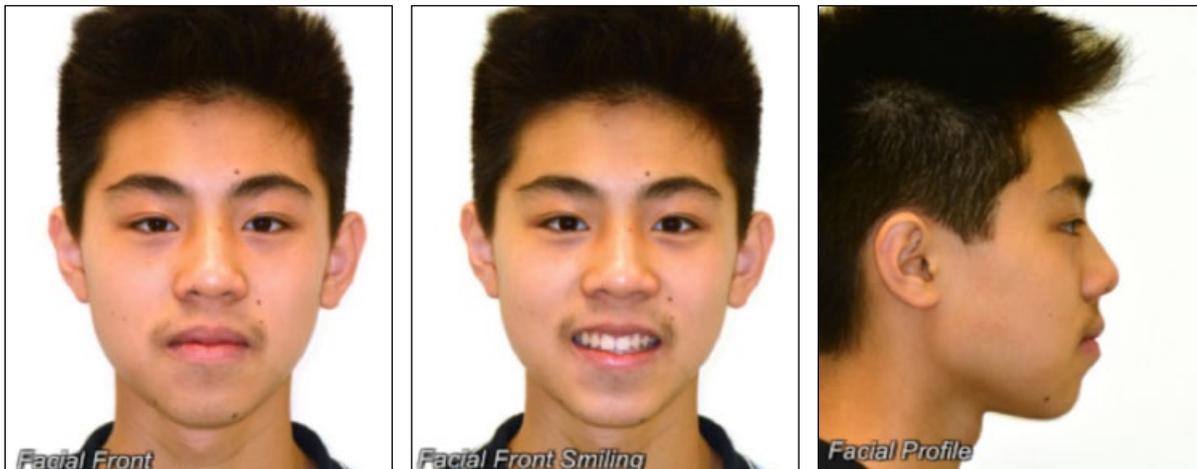


Figure 9. End of treatment extra-oral photographs.



Figure 10. End of treatment intraoral photographs.

showed complete healing (Figure 11). The one-year post-deband review in November 2016 showed sound maintenance of the occlusion. The third molars are being monitored and will be managed as needed.

Discussion

The presented case was relatively routine from an orthodontic perspective. The presenting malocclusion and patient concerns were managed in an appropriate manner. However, the case highlights the need for orthodontists to also manage other dental concerns that may present during orthodontic care.

Following the surgical curette, the soft tissue lesion resolved spontaneously and there were no associated symptoms. Appropriate radiographs and referrals allowed for prompt assessment and management of the pathology.

A histological examination of the biopsy specimen (Figure 12) revealed features consistent with an inflamed cystic lesion which was lined by thin, non-keratinised, stratified squamous epithelium with a surrounding inflamed fibrous tissue capsule. Occasional epithelial rests were seen within the fibrous tissue. There was no striking pallisading of the basal cells and no areas resembling stellate reticulum were identified. No goblet cells were evident with Periodic Acid Schiff Diastase (PASD) staining and no fungal elements observed. Given that the adjacent teeth were vital, the possibilities of a radicular or periapical cyst were considered unlikely and hence a lateral periodontal cyst was considered as a possibility.

A lateral periodontal cyst is a non-keratinised developmental cyst occurring adjacent or lateral to the root of a tooth. The origin of the cyst is believed to be related to the proliferation of dental lamina remnants. The majority of lateral periodontal cysts occur in the mandibular premolar and cuspid region and occasionally in the incisor area. In the maxilla, lesions are noted primarily in the lateral incisor region. A distinct male incidence is noted, with a greater than 2-to-1 distribution.⁴ The median age for this cyst is between 40 and 60 years, with a range of 20 to 85 years.⁴ A lateral periodontal cyst presents as an asymptomatic, well-delineated, round or teardrop-shaped unilocular (and occasionally multilocular) radiolucency with an opaque margin along the lateral surface of a vital tooth root. Root divergence is rarely seen. The clinical location and radiographic features typically associated



Figure 11. One year post-surgical radiograph.

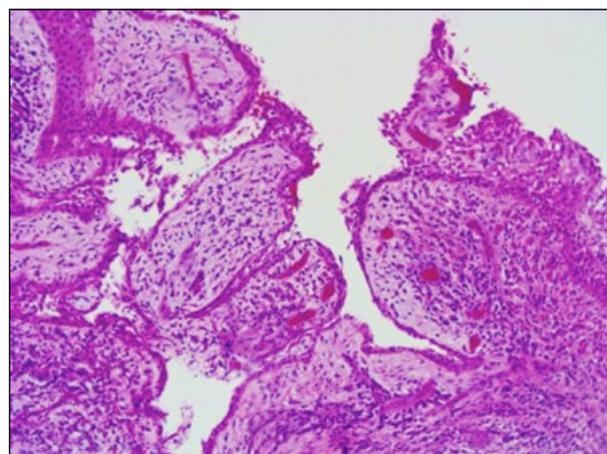


Figure 12. Haematoxylin and eosin (H&E) stained histological sections of the lesion showing a thin non-keratinising stratified squamous epithelial lining surrounded by an inflamed fibrous connective capsule.

with a lateral periodontal cyst were all found in the present case.

Lateral periodontal cysts are rare,⁴ particularly in a young healthy male. Despite the clinical and radiographic characteristics, the histological features of this lesion were not in themselves diagnostic of a lateral periodontal cyst. The epithelial lining of the cyst typically has nodular thickenings often containing clusters of glycogen-rich, clear epithelial cells. These foci of clear cells and focal nodular thickenings were not present in the current histological sample. This could be attributed to the particular sample sent for analysis, which was possibly not representative of the entire lesion. Furthermore, inflammation around the lesion may have masked the diagnostic histological features. Despite this, and based on the clinical signs and symptoms as well as the lesion's radiographic appearance, a diagnosis of a lateral periodontal cyst

was considered to be most likely. Local excision is generally curative but ongoing radiographic follow-up is recommended. This was the course of action in this case.

Conclusion

The present case report details the management of an incidental clinical finding during routine orthodontic treatment. It further highlights the need for appropriate follow-up radiographs and referral. The orthodontic clinician is advised to assess, not only the state of orthodontic treatment, but also the overall clinical presentation of the patient, including any radiographs that are taken during the course of orthodontic care.

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References

1. Rischen RJ, Breuning KH, Bronkhorst EM, Kuijpers-Jagtman AM. Records needed for orthodontic diagnosis and treatment planning: a systematic review. *PLoS One* 2013;8:1-8.
2. Friedland B, Miles DA. Liabilities and risks of using cone beam computed tomography. *Dent Clin North Am* 2014;58:671-85.
3. Bondemark L, Jeppsson M, Lindh-Ingildsen L, Rangne K. Incidental findings of pathology and abnormality in pretreatment orthodontic panoramic radiographs. *Angle Orthod* 2006;76:98-102.
4. Regezi JA, Sciubba JJ, Jordan RC. *Oral Pathology – Clinical Pathologic Correlations*. 4th edn. St Louis: Elsevier Science, 2003;244-6.