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# Serendipity on Bitewing Radiographs

**Abstract:** An odontoma is described as a hamartoma, which is usually classified as a benign tumour. This clinical report will describe an unusual presentation of an odontoma in the mandibular primary molar region and highlight the importance of a comprehensive clinical and radiographic examination. A systematic approach to reading bitewing radiographs will also be described.

**CPD/Clinical Relevance:** This clinical report serves as a good example to highlight the importance of thorough radiographic examination to enable detection of tooth abnormalities and facilitate timely interventions; thus preventing or reducing the severity of the potential complications.

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An odontoma is defined as the formation of varying amounts of enamel, dentine and pulpal tissue, originating from the growth of completely differentiated epithelial and mesenchymal cells, giving rise to functional ameloblasts and odontoblasts.[1] According to the World Health Organization, ICD-10 classification, odontomas are classified as benign tumours. However, odontomas are not considered to be true neoplasms, instead they are described as a type of hamartoma, which is a developmental anomaly in the form of a disorganized collection of tissue.[2]

While the odontoma is a relatively common lesion in the permanent dentition, reports of odontomas associated with the primary dentition are rare. Generally, odontomas are more commonly found in the second decade of life, usually in the anterior maxilla or the posterior mandible.[3] This clinical report will describe an unusual presentation of an odontoma in the mandibular primary molar region and highlight the importance of comprehensive clinical and radiographic examinations. A systematic approach to reading bitewing radiographs will also be described.

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## Clinical report

A six-year-old boy was referred to the paediatric dental clinic for management of multiple carious lesions in his primary teeth. He had been diagnosed with high-functioning autism and was otherwise medically well with no known allergies. There was no family history of missing or extra teeth.

Due to behavioural issues secondary to his medical condition, only a limited clinical examination was possible at the initial appointment. Given the high treatment need and the patient's medical condition, it was considered appropriate to perform the dental treatment under general anaesthesia (GA). Following a comprehensive clinical examination under GA, the patient was in his early mixed dentition with multiple carious lesions, and no obvious soft tissue abnormalities.

As part of a standard treatment protocol for children who do not have radiographs prior to dental treatment under GA, two bitewing radiographs (Figure 1a) and an anterior occlusal radiograph were taken. The bitewing radiographs revealed multiple interproximal carious lesions on several primary molars. Furthermore, an irregularity in relation to the mesial root of the LRD was noted. Subsequently, a periapical radiograph (Figure 1b) revealed a multi-loculated radio-opacity with a thin radiolucent border inferior to the mesial root of the LRD, with the

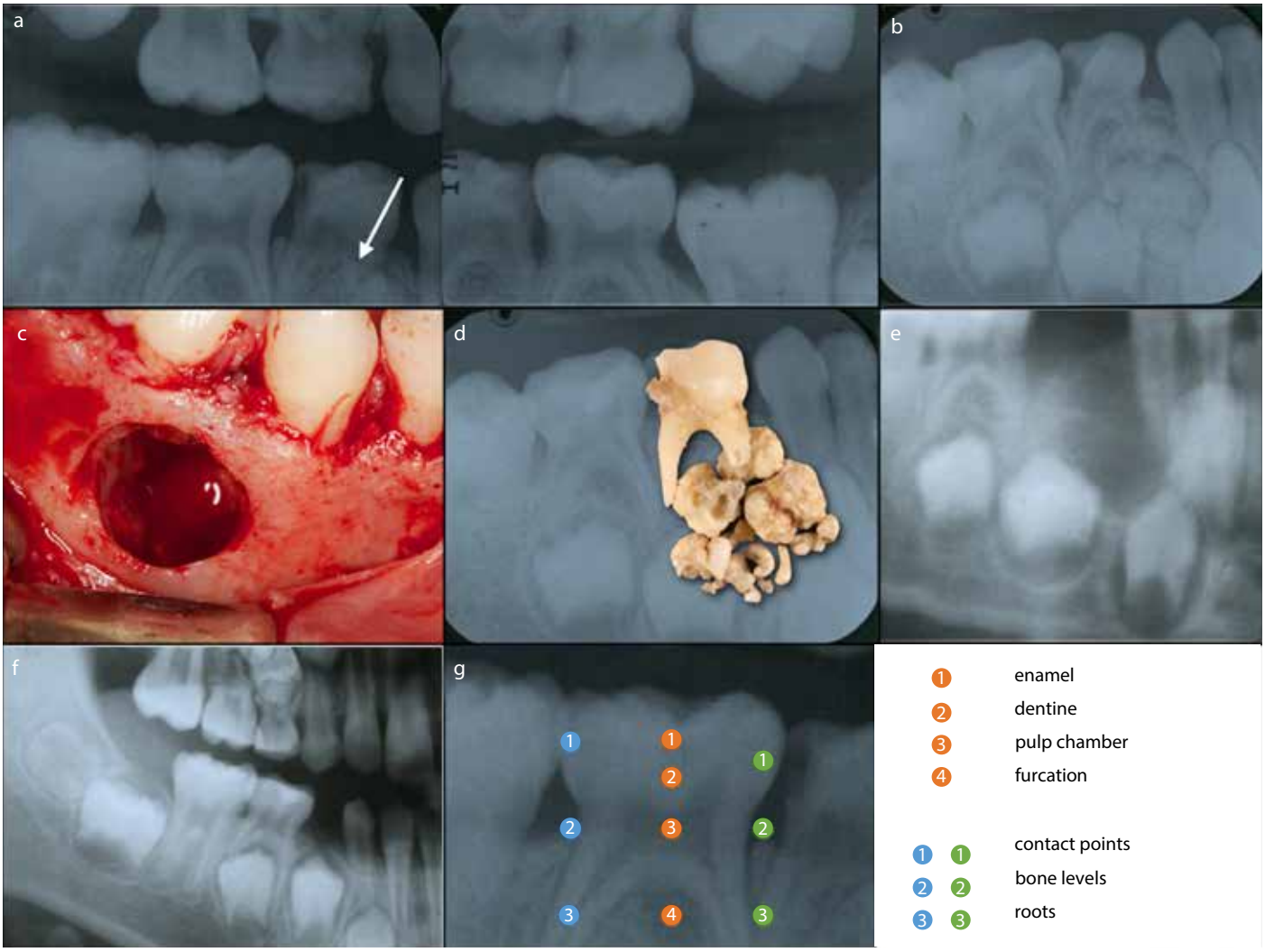


**Figure 1.** Radiographs and clinical photographs of a six-year old boy who exhibited an odontoma in the LRD region. **(a)** Bitewing radiographs taken under general anaesthesia for management of carious lesions revealed an irregularity in relation to the mesial root of tooth LRD (indicated with an arrow); **(b)** Periapical radiograph illustrating the multi-loculated compound odontoma with a radiolucent border; **(c)** Surgical site following removal of an odontoma; **(d)** Periapical radiograph with superimposed LRD and the compound odontoma; **(e)** Post-operative radiograph following removal of the LRD and compound odontoma; **(f)** Two-year follow-up radiograph showing the favourable position and development of the LR4; and **(g)** Systematic approach for reading a bitewing radiograph.

developing LR4 slightly distal to its usual location and the LR3 appearing rotated.

Consequently, informed consent was obtained from the patient's parents and the odontoma was surgically removed and the LRD extracted. A full thickness mucoperiosteal buccal flap was raised (Figure 1c), the odontoma was identified and surgically removed. The odontoma had 16 separate denticles (Figure 1d). Subsequently, the LRD was extracted and the buccal flap repositioned using resorbable sutures. An immediate post-operative radiograph (Figure 1e) revealed no remnants of the odontoma. The patient was reviewed 21 days post-operatively and reported no undue healing sequelae.

Placement of a space maintainer was not an option and the patient was placed on a regular review. At a follow-up appointment, 24 months post-surgery, a panoramic radiograph revealed the development and position of the LR4 (Figure 1f) to be consistent with that of its antimere and the LR3 exhibited derotation.

## Discussion

Odontomas often remain undiagnosed until either a complication arises or they are detected as an incidental finding, as was the case for the patient described in this clinical report. The patient had reported no prior clinical signs or symptoms and there were no noticeable disturbances to the eruption or condition of the adjacent primary teeth.

While it is often thought to be of little clinical value, odontomas can

| After ensuring that the radiograph being read is of the correct patient and side:<br>1. Check for the diagnostic value of the radiograph (eg angulation, distorting, overlaps, etc)<br>2. Check the teeth present<br>3. Use a consistent approach when reading the radiograph (eg left-to-right or mesial-to-distal), reading each dental arch separately<br>4. Assess each tooth in three vertical bands, one each along the mesial and distal surface of each tooth, and one along its midline, as demonstrated in Figure 1g (consider using the classification system for identifying carious lesions such as that described by Mejare and colleagues[15]) |
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**Table 1.** Systematic approach for reading a bitewing radiograph.

be classified as either *compound*, with organized layers of enamel, dentine, pulp and cementum, or as *complex*, with a disorganized arrangement of the same dental tissues.[4] This is often confirmed based on histopathological findings. Radiographically, both forms of odontoma appear well outlined with a surrounding radiolucent border. The compound type tend to resemble a collection of crude tooth-like structures, while the complex type tend to appear radiographically as a solid, heterogenous mass.[4] The radiographic appearance of this odontoma was consistent with that of a compound odontoma with multiple tooth-like structures.

To date, the literature has only a few cases of odontomas associated with primary molars. The only reported case of an odontoma associated with a mandibular primary molar was that by Piattelli and colleagues, of a complex odontoma associated with the roots of a retained LLE in a 25-year-old male patient.[5] Long *et al*[6] and Motokawa *et al*[7] both reported cases of odontomas associated with maxillary molars, one compound and one complex, respectively. Closest in anatomical location to this case is that reported by Yildirim-Öz *et al*[8] – a case of a compound odontoma associated with a LRC. Several other cases[9-14] of compound and complex odontomas have been reported involving primary canines, however, these were found in the maxilla.

An interesting finding, although serendipitous in this case, was the presence of an odontoma initially identified as an irregularity on the bitewing radiograph. Most often, bitewing radiographs are used primarily to detect:
(a) Interproximal caries;
(b) Depth of carious lesions;
(c) Alveolar bone height; and
(d) Furcal pathology in the primary molars.

Furthermore, in children, the size of the film and their behavioural issues determine the information obtained on these radiographs. Most often, clinicians read these films in isolation, specifically to identify the routine issues for which the radiograph was originally taken. Nevertheless, a systematic approach is critical to identify the abnormalities that can be easily missed on these radiographs. An example of an approach, employed in this case, is outlined in Table 1 and Figure 1g. A systematic approach such as this will facilitate identification of dental abnormalities, as is illustrated in the present report. It may also help a busy clinician to identify the less obvious tooth abnormalities and instigate additional investigation, thus facilitating the provision of the appropriate treatment.

Conversely, in the present case, if the odontoma was not detected, then it is highly likely that the LRD would have received a stainless steel crown following a pulp therapy. Subsequently, this could potentially have caused delayed exfoliation of the LRD, failure of eruption of the LR4 and/or LR5, thus necessitating another general anaesthetic to remove the odontoma (given the patient's age and behavioural issues) and orthodontic therapy.[16]

At the 24-month follow-up visit, a panoramic radiograph revealed the LR4 to be in its normal path of eruption with some space loss between the LRC and LRE. The majority of this space loss was due to the distal tipping of the LRC, which is a common presentation following early loss of primary first molars.[17] However, the position and development of LR4 illustrates the impact of the timely identification and removal of the odontoma. Furthermore, it was deemed best to avoid use of a space maintainer in this case due to issues related to the patient's behaviour.

## Conclusion

This clinical report serves as a good example to highlight the importance of thorough radiographic examination to enable detection of tooth abnormalities and facilitate timely interventions; thus preventing or reducing the severity of the potential complications. Clinicians should employ a systematic approach to reading radiographs to identify such inconspicuous tooth abnormalities.

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