

When Should You Take Radiographs for Children?



Dr. Reza Nouri

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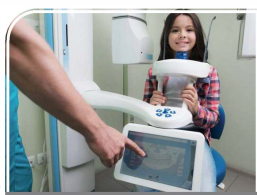
Questions about when to take a child's first radiographic examination are common, says Dr. Reza Nouri, a certified specialist in pediatric dentistry in the Greater Vancouver Area. Timing a child's first radiograph depends on the patient's individual circumstances, and not their age, according to the American Academy of Pediatric Dentistry (AAPD)¹ guidelines on prescribing dental radiographs for infants, children, adolescents, and persons with special health care needs. The AAPD guideline states, "Because each patient is unique, the need for dental radiographs can be determined only after reviewing the patient's medical and dental histories, completing a clinical examination, and assessing the patient's vulnerability to environmental factors that affect oral health."

Here, Dr. Nouri shares examples from his practice that illustrate the individual factors he considers when deciding when to take a child's first radiograph.

Anterior Periapical Radiographs

Anterior periapicals should be considered in the following clinical situations: the child's anterior teeth have closed contacts, making them prone to interproximal caries; pathologies or anomalies are noted; or the child has experienced trauma to anterior teeth. With pediatric patients, the tooth often won't appear unusual even when periapical lesions develop, so taking an anterior periapical radiograph shows you what's going on inside the bony structure.

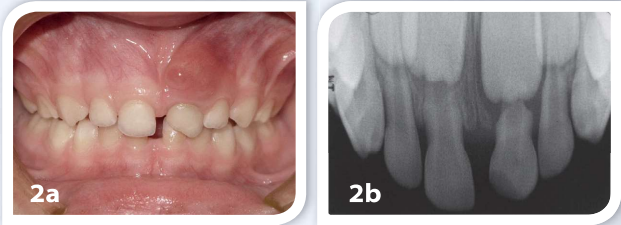
- ▶ **Establishing a reference after trauma.** A child (age 3) fell and intruded tooth 51 and subluxated tooth 61 (**Image 1a**). In cases of trauma to anterior teeth, periapical radiographs (**Image 1b**) will be used as your reference for a follow-up assessment, particularly if you elect to watch and observe over the next couple of months to see if tooth 51 self-erupts. Immediately following trauma, it is important to focus on bringing down the internal inflammation of the tooth structure as much as possible; you might recommend that the patient stay on anti-inflammatories and to keep the tooth as cold as possible for 48 hours. It's also important to tell the parents to keep an eye out for the formation of an abscess by lifting the lip once a week and checking the area above the gum line. Children do not necessarily complain about an abscess so it's important for parents to be vigilant.



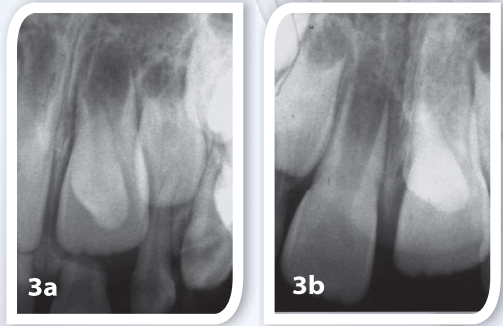
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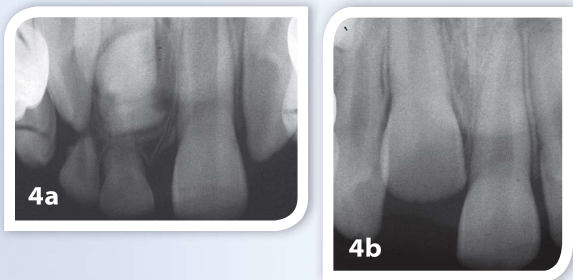
► **Assessment of pathology following trauma or as a result of dental caries.** A child (age 4.5) had a mesioincisal fracture on tooth 61 after experiencing a traumatic injury (**Image 2a**). The fracture was not significant, so the parents opted to wait and observe. In cases of trauma, periapical radiographs (**Image 2b**) will allow you to assess any developing pathology. In this case, six months following the traumatic incident, a periapical inflammatory lesion resulted in premature root resorption of tooth 61 and adjacent bone, allowing for premature eruption pattern of the permanent successor, tooth 21. If this lesion is left untreated for a long period of time, it is sure to result in damage to the permanent incisor.



► **Providing anticipatory guidance.** We detected a mesiodens in a child (age 5.5) and wanted to do a close follow-up to make sure it was not interfering with the eruption of permanent teeth. In the radiograph, you can see that the incisal edges of the central incisors are at the same level, an indication that the mesiodens is not interfering with eruption of these teeth (**Image 3a**).



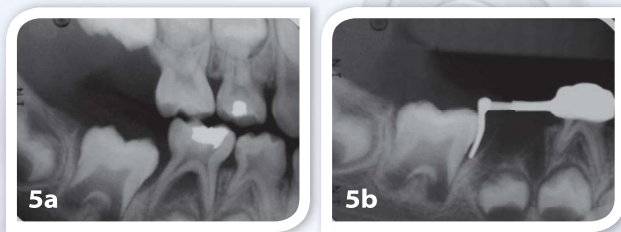
About 9 months later, a follow-up radiograph shows that tooth 11 has erupted but tooth 21 is now delayed (**Image 3b**), an indication that the mesiodens is interfering with its eruption. This suggests the timing is right to extract the mesiodens so the permanent tooth can fully erupt into position (**Image 3c**), as long as you feel comfortable about the positioning of the tooth and performing an extraction without damage to tooth 21. In this case, these radiographs helped us provide the parents with anticipatory guidance for their child.



► **Managing anomalies.** This case of a boy (age 8) with an odontoma illustrates the importance of taking radiographs at the right time. A radiograph was taken because there was a concern that tooth 11 was not erupting, despite the eruption of tooth 21 and the partial eruption of tooth 22 (**Image 4a**). An odontoma was detected on the radiograph. If this lesion had been detected earlier, the odontoma could have been extracted earlier, allowing for the proper eruption of 11. By delaying the extraction, tooth 12 has started to tip mesially, blocking 11 from eruption (**Image 4b**). Extraction of the odontoma will likely cause some movement of tooth 11, but it will not reach its ideal position without intervention.

Posterior Periapical Radiographs

We take posterior periapicals in order to diagnose trauma to teeth, including any fractures; deep caries and pulpal involvement; and eruption anomalies. Keep in mind that the first place you are likely to see signs of pulpal inflammation and pathology in primary teeth is the furcation area. For this reason, posterior periapicals in primary molars should be taken at a bitewing angle to visualize the furcation area without having the follicle of the permanent successor overlapping it.



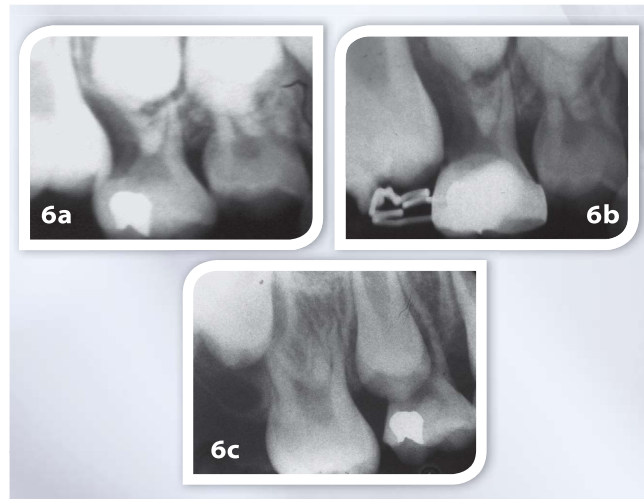
► **Detecting pathology in primary molars.** This posterior periapical radiograph shows tooth 85 had a very deep restoration placed, which may have been through the pulp horn (**Image 5a**). As a result, necrosis and pathology of the tooth developed, which was first noticed in the furcation area. When this tooth was extracted,



a distal-shoe space maintainer was fabricated chairside and placed immediately (**Image 5b**).

- ▶ **Detecting eruption anomalies.** Eruption anomalies could also be detected by the posterior periapicals, such as this case (**Image 6a**), which shows an ectopically erupting tooth 16 and distal root resorption on tooth 55. About 70% of the time, permanent molars that ectopically erupt go through self-correction due to the posterior growth of the jaw, so they don't necessarily need treatment. But sometimes, after months of observation, they do not self-correct. In this case, intervention by means of a distalizing appliance allowed for proper eruption of tooth 16 (**Image 6b**).

A few years after the correction of 16 (**Image 6c**), the permanent tooth is close to eruption and there was no need to extract tooth 55.



Bitewing Radiographs

A posterior bitewing exam should be performed 6 months to a year after the posterior contacts are closed in primary molars. When posterior contacts are closed, you cannot rely on your clinical assessment alone to diagnose early interproximal lesions. Radiographs or other forms of visualization are necessary because by the time you can see an interproximal lesion clinically, the lesion is already quite deep (**Image 7**).

- ▶ **Diagnosing interproximal lesions.** In this radiograph (**Image 7**), you can see tooth 64 has a very deep lesion that has penetrated into the pulp and the distal marginal ridge has broken down. Usually when you see the marginal ridge of a primary molar fracturing as a result of caries, there's about an 80% chance that the caries has already entered the pulp.
- ▶ **Detecting occult caries.** Another thing to consider is detecting occult caries, or hidden cavities, which commonly occur in primary teeth. Tooth 84 in this radiograph could clinically appear fine; you might see a bit of staining but underneath the radiograph shows a deep carious lesion (**Image 8**).
- ▶ **Diagnosing periradicular lesions, pathology or dental anomalies.** The quality of these bitewing radiographs (**Images 7 and 8**) demonstrate the amount of diagnostic information one can gather when such radiographs are properly positioned and exposed in cooperative patients. Even the follicles of developing succedaneous teeth are visible on these bitewing radiographs. Ideally these films should've been placed more anteriorly in order to capture the contact area between the primary canines and the first primary molars.



Panoramic Radiographs

Panoramic radiographs are used in cases of severe trauma to ensure there are no bone fractures or severe fractures of the dentition in posterior regions, and to detect pathology or anomalies. If there is no such indication to take a panoramic radiograph early on, the best timing for a panoramic radiograph is in the early mixed dentition.

- ▶ **Early intervention to remove mesiodens.** This patient had the first panoramic radiograph taken in the early mixed dentition (**Image 9**). You can see the two permanent central incisors in the lower jaw, and the first permanent molars have erupted partially. You can also see the inverted mesiodens, which is resulting in the delayed eruption of tooth 21. If you look at the incisal edges of these teeth you can see that eruption of tooth 21 is delayed. One should give consideration to removing that mesiodens in order to allow for proper eruption of tooth 21.





10

► **Timing surgical removal of odontoma in anterior region.**

Delayed timing of the panoramic radiograph in this case resulted in delayed eruption of tooth 21 for this patient (age 9). The radiograph shows teeth 11, 12 and 22 have erupted but tooth 21 is delayed (**Image 10**). The odontoma developing in this area was not detected earlier and now the roots of tooth 21 have developed in a dilacerated form. Even if the odontoma were to be extracted, tooth 21 has a very low chance of self-eruption. Had this been diagnosed and treated by an extraction of that odontoma early on, then tooth 21 would have erupted into place or at least would have had a better chance of eruption.



11a

► **Timing surgical removal of odontoma in posterior region.**

Here is another case of an odontoma forming in the posterior region, obstructing the eruption of tooth 26 (**Image 11a**). Again, the timing of the panoramic radiograph is important; tooth 26 could have been treated earlier had we diagnosed the odontoma at an earlier stage with a panoramic radiograph. Fortunately, we extracted the odontoma and tooth 26 erupted into place with some space loss that would be treated by means of a space regaining appliance (**Image 11b**). ➤



11b

REFERENCE

1. American Academy of Pediatric Dentistry. Guideline on prescribing dental radiographs for infants, children, adolescents, and persons with special health care needs, 2012. Available at: http://www.aapd.org/media/policies_guidelines/e_radiographs.pdf. Accessed January 4, 2019.



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