Non-syndromic Radiculomegaly and Concurrent Anomalies: A Case Series

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Background

- Radiculomegaly (RM) is defined as an increased root-crown ratio of teeth by ≥ 2.5 times.[1]
- RM is a rare finding that is associated with oculofaciocardiodental, Klinefelter, and Cockayne syndromes.
- Non-syndromic RM is exceptionally rare.
- There are very few case reports of non-syndromic, generalized RM affecting primary or permanent dentition.

Methods

- Evaluated routine panoramic radiographs from pediatric patients reporting to Children's Hospital Colorado (CHCO) for dental care. Non-syndromic RM at CHCO and associated findings were evaluated.
- Conducted under an IRB-exempt study at the University of Colorado.
- Panoramic evaluation reviewed approximately 80 developmental dental anomalies of pathoses affecting number, shape, position, structure, and other developmental anomalies and pathoses as previously described.[2]
- This case series discusses three, unrelated healthy pediatric cases of RM and associated developmental anomalies detected on panoramic radiographs.

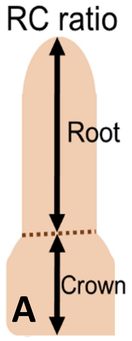
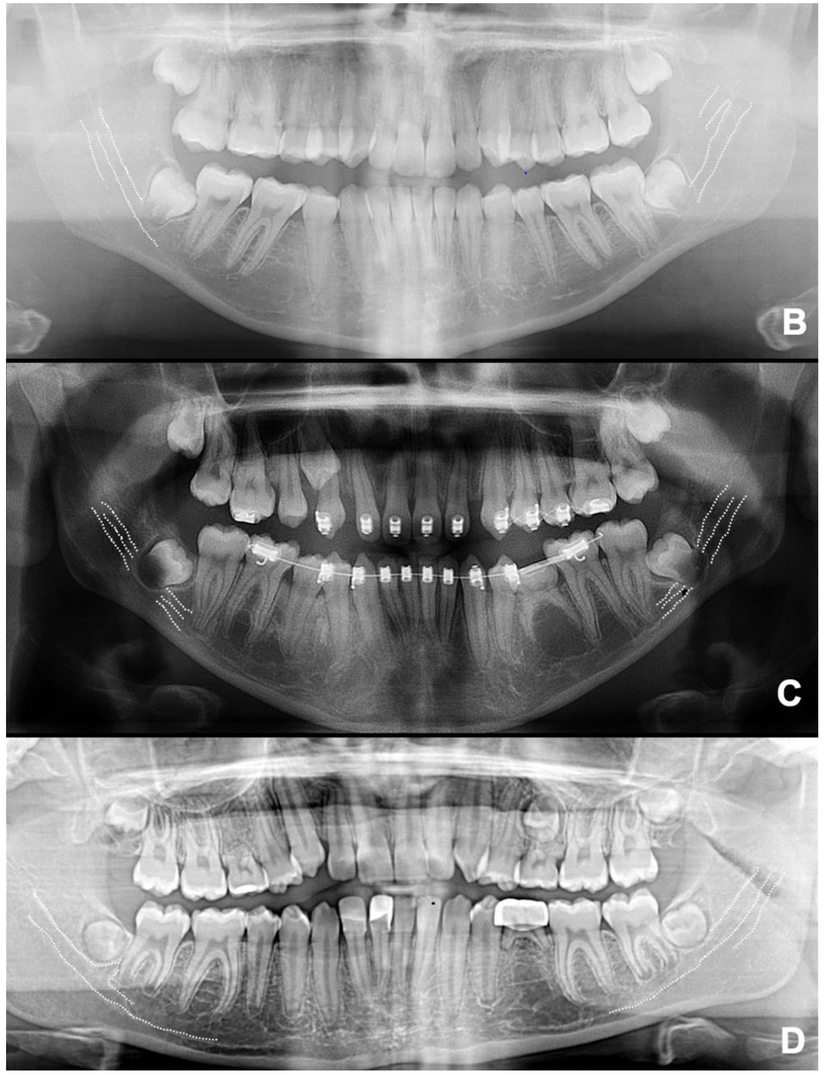


Figure Legend. Method to calculate root-crown ratio for each tooth is described in the sketch diagram (A). Panoramic radiographic images of all three pediatric patients with non-syndromic generalized radiculomegaly (affecting more than two-thirds of the teeth) are presented (B-D). The first case (B) demonstrated radiculomegaly (RM) with hypodontia (#29) and bilateral bifid mandibular canal (BMC). The second (C) and third (D) cases demonstrated RM with BMC and hypodontia (#20 for case C and #4 and #20 for case D).



Results

- None of the discussed cases had significant medical history.
- RM has been previously associated with number and shape anomalies such as hypodontia and gemination.[1] All three discussed cases present with RM and hypodontia.
- Bifid mandibular canal (BMC) was an unexpected finding for all three RM cases.

Discussion

- RM and hypodontia have implications for future orthodontic management; for example, distalization of molars affected with RM may lead to impingement of the inferior alveolar nerve.
- Orthodontic management of RM cases should consider the shape and number of anomalies affecting arch sizes.
- Anticipatory guidance should emphasize the importance of regular dental visits and caries prevention in patients with RM.
- Advanced caries may require endodontic therapy which may be complicated by the long length of roots with RM.
- BMC may lead to failure of an inferior alveolar nerve block, further complicating routine operative dentistry, endodontic treatment, and oral surgery.

Conclusion

- Association of RM with other developmental anomalies may be indicative of an orodental spectrum not yet documented.
- Additional prospective studies are needed to evaluate a larger phenotypic and genotypic data set to determine the cause, prevalence, and diagnostic significance of such a spectrum.

References

1. Puranik *et. al.,* J Dental Sci. 2022.
2. Gandhi *et. al.* CP. Pediatr Dent. 2021.