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*Clinical Image*

# Bilateral Trifid Mandibular Canal: A Radiographic Finding

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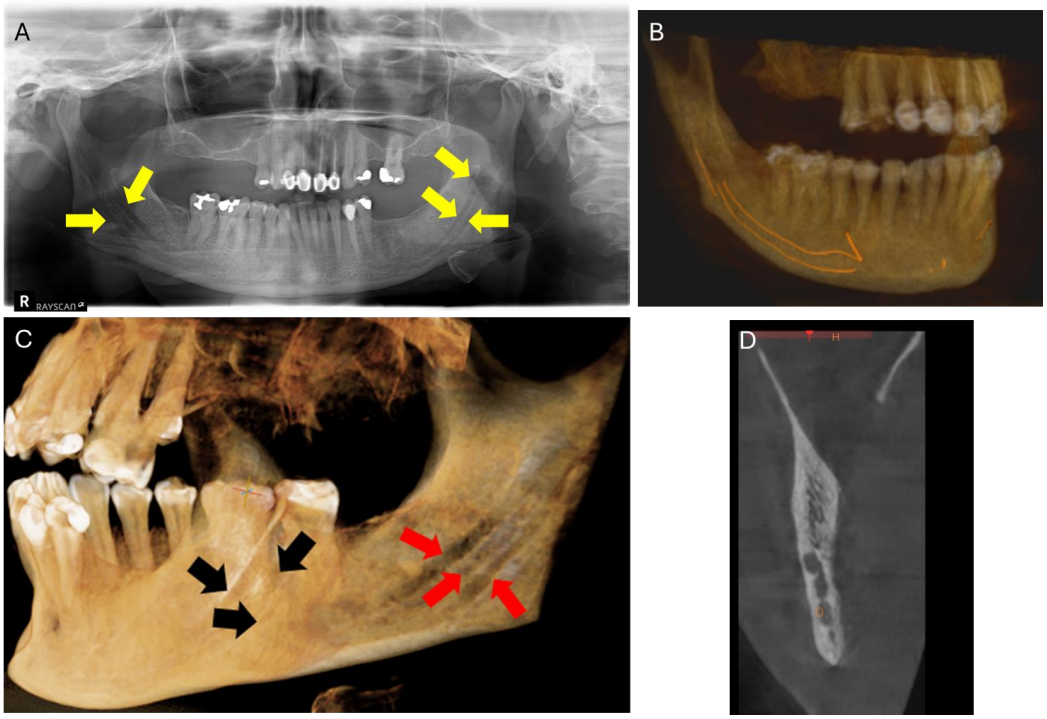


**Figure 1:** A. Radiographic image showing bilateral trifid mandibular canal. This variation in the mandibular canals underscores how intricate and diverse mandibular canal structures can be. B. The cone beam computed tomography (CBCT) image highlights the trifid mandibular canals. C. On the right side of the image, red arrows clearly point out the three distinct branches of the trifid mandibular canal. On the left side, black arrows indicate the three branches of the trifid mandibular canal, providing precise identification of each branch. D. An orthoradial slice on the right side of the mandible displaying a trifurcated root canal. The image clearly reveals three distinct branches of the root canal, indicating a complex anatomy.

This clinical image report presents a case of mandibular canal duplication involving bilateral trifid mandibular canals. A 47-year-old female patient attended the dental clinic for a routine check-up. She had no history of chronic systemic disease but reported significant pain during previous dental procedures on her lower teeth. During the clinical examination, multiple missing teeth were observed (15, 16, 17, 18, 25, 27, 28, 36, 37, 38, and 48). Additionally, a cavitated carious lesion was found on tooth 23, which was painful to vertical percussion, cold, and heat. A routine panoramic radiograph (Fig. 1) revealed an apparent bifid mandibular canal (BMC) on the right side and a trifid mandibular canal (TMC) on the left side, an anatomical variation of the mandibular canals. Unfortunately, a computed tomography scan could not be requested as this technology is not yet available in the country. Subsequently, a cone beam computed tomography (CBCT) was requested, which confirmed the bila-teral presence of trifid mandibular canals (Fig. 2). Initial treatment included scaling, polishing, and fluoride application. During the subsequent visit, endodontic treatment was performed on tooth 23, followed by its restoration. The patient was referred for a prosthodontic consultation and opted for removable prostheses for both the upper and lower arches.

The first case report of mandibular canal bifurcation was described by Theodore A. Kiersch and Jack E. Jordun in 1973, detailing unilateral duplication of the mandibular canal [1]. Later, in 2006, Sandor Bogdan et al. reported the first known case of a triple mandibular canal [2]. The term "bifid" comes from Latin and means a division into two parts or branches. Bifid mandibular canals start at the mandibular foramen and can hold a neurovascular bundle in each branch [3]. The BMC can be identified in panoramic radiographs. Cross-sectional tomographic images perpendicular to the alveolar ridge provide more detailed information about the mandibular canal and its precise pathway [3]. The initial screening to identify BMCs can be conducted using conventional panoramic radiography. If BMCs are diagnosed, it is advisable to perform additional cone beam computed tomography (CBCT) before proceeding with mandibular surgery.

In addition to detecting BMCs, CBCT can also reveal the presence of TMCs and provide detailed insights into the exact path of the involved canals [4]. BMC and TMC have significant clinical implications. Inadequate anesthesia may be a concern with any bifurcation type, but it becomes particularly critical when two mandibular foramina are present. During lower third molar surgery, extreme caution is necessary when BMCs are located near the molar area. The tooth may intrude into or lie within the canal itself. Complications such as traumatic neuroma, paresthesia, and bleeding can arise due to failure to recognize this anomaly and its implications, potentially involving a second neurovascular bundle in bifid canals [3].

When dentists encounter anesthesia failure while attempting mandibular nerve block in patients with BMC and bifurcated mandibular nerve (BMN), they should consider using an alternative local anesthesia technique [5]. It's also important to consider TMC, as these variations can make standard anesthesia techniques less effective and may require more tailored approaches. Additionally, the use of alternative local anesthetics such as articaine is suggested. It is important for dentists to be aware of this anatomical variation and to recognize it to avoid complications during dental procedures. This case emphasizes the importance of knowing and identifying anatomical variations such as the bifid mandibular canal to ensure appropriate patient management and prevent potential complications.

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**Conflicts of Interest:** None.

**Supplementary Materials:** None.

## References

1. Kiersch TA, Jordan JE. Duplication of the mandibular canal. Oral Surgery, Oral Medicine, Oral Pathology. 1973 Jan;35(1):133–4.
2. Bogdán S, Pataky L, Barabás J, Németh Z, Huszár T, Szabó G. Atypical Courses of the Mandibular Canal. Journal of Craniofacial Surgery. 2006 May;17(3):487–91.
3. Claeys V, Wackens G. Bifid mandibular canal: literature review and case report. Dentomaxillofacial Radiology. 2005 Jan;34(1):55–8.
4. Mizbah K, Gerlach N, Maal TJ, Bergé SJ, Meijer GJ. The clinical relevance of bifid and trifid mandibular canals. Oral Maxillofac Surg. 2012 Mar 23;16(1):147–51.
5. Sheikh.Mahnaz, Badrian H, Ghorbanizadeh S. Bilateral bifid mandibular canal. Dent Res J (Isfahan). 2012;9(7):132–5.Kim J, Jung S, Lee KJ, Yu HS, Park W. Forced eruption in impacted teeth: analysis of failed cases and outcome of re-operation. BMC Oral Health. 2024 Feb 20;24(1):254. doi: 10.1186/s12903-024-03963-x. PMID: 38378499; PMCID: PMC10877739.