

## Case Report

## Sequential imaging of an impacted mandibular second premolar migrated from angle to condyle

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**Abstract:** Extreme distal migration of impacted teeth to the subcondylar area and condyle is very rare. Using an interesting sequence of radiographs showing the path of the tooth in the mandible, we describe the intrabony migration of a mandibular second premolar from angle to condyle in a young woman. Cone-beam computed tomography was used to establish the precise location of the tooth. (J Oral Sci 56, 303-306, 2014)

Keywords: ectopic; impacted tooth; diagnostic imaging; CBCT.

### Introduction

Impaction is a pathologic condition in which a tooth in the oral cavity does not erupt within the time and physiological limits of normal eruption. Intraosseous migration of an impacted tooth is a dental anomaly that occurs mostly in the permanent dentition of the mandible (1), particularly in canines and molars.

The prevalence of migration of impacted premolars in the lower jaw is low. The condition is more frequent in women (1,2) and is often unilateral (3). One report noted that the migration follows a distoangular path in the ramus, coronoid notch, and coronoid process (4).

Although the cause of this condition is unclear, the involvement of environmental and genetic factors has been suggested (2,5).

Here, we use an unusual imaging sequence to describe the migration of a tooth from the mandibular angle to the condyle.

### Case Report

In 2006, a 21-year-old woman was referred to our university clinic for dental treatment. Extraoral examination showed no abnormalities. Intraoral inspection revealed a deciduous mandibular second molar. A panoramic radiograph revealed unerupted maxillary and mandibular third molars in all quadrants. The right lower second premolar was absent, and the impacted left lower second premolar was distally inclined in the angle of the mandible (Fig. 1A). There was no evidence of pathology in the tooth. In addition, no pathology or conditions that might cause eruption anomalies were noted in her family history or medical history. She was informed of treatment options for the impacted teeth but declined to undergo surgical treatment at the time because of financial constraints.

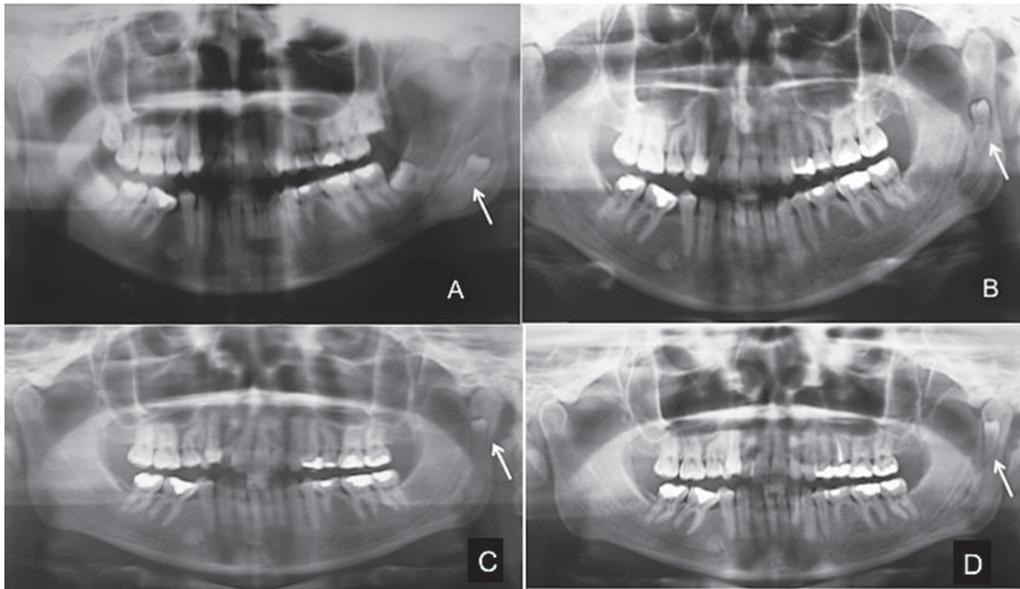
In 2009, she returned to the clinic and reported that she had visited a private dentist who removed all the third molars 1 year after her initial consultation with us. She also reported limitation in mouth opening and discomfort in the left preauricular area during mastication. A panoramic radiograph showed that the second premolar was dislocated high on the left side of the ascending ramus of the mandible (Fig. 1B). The patient was informed of the findings and, although extraction was strongly recommended, she postponed surgery.

The patient came to us again, in 2010, with pain and

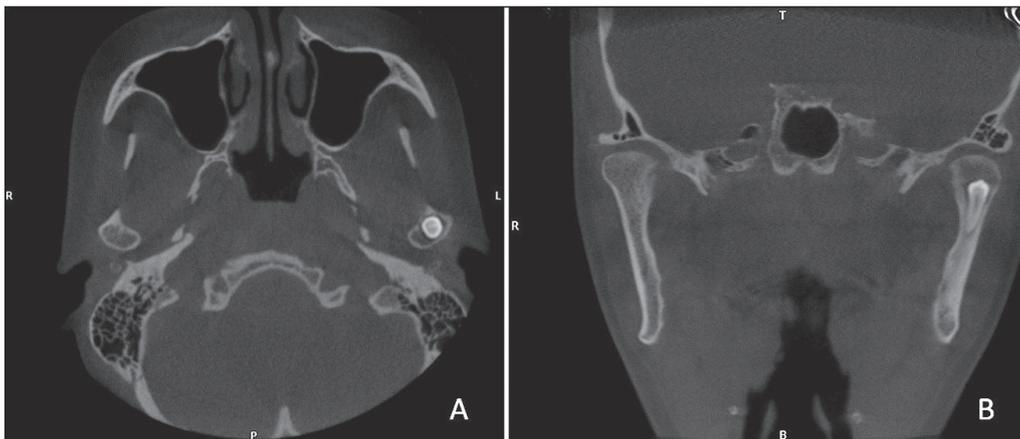
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**Fig. 1** A. Initial panoramic radiographs showing the left inferior second premolar in the angle of the mandible. B. Three years later, a panoramic radiograph shows the tooth in the ascending ramus of the mandible. C. The tooth is in a more superior position as compared with the second radiograph. D. A panoramic radiograph shows the impacted tooth in the mandibular condylar head.



**Fig. 2** Axial (A) and coronal (B) cone-beam CT images showing the left condyle.

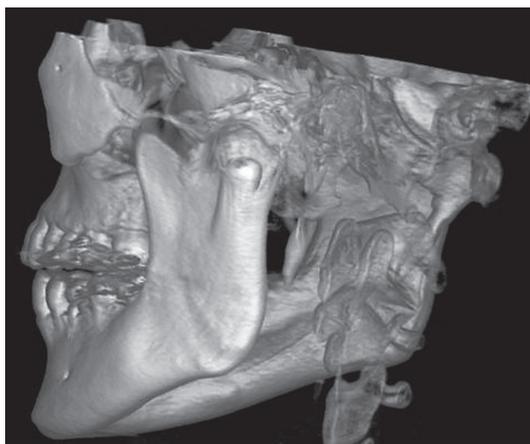
discomfort in the mandible. A new panoramic radiograph obtained to reevaluate migration of the tooth showed further distal and upward migration (Fig. 1C). Surgical removal was again recommended and once again declined.

In 2011, the patient presented for surgery, and a new panoramic radiographic was obtained (Fig. 1D). The tooth had migrated to the head of the condyle, but there was no pathologic change in surrounding bone. Despite her considerable discomfort, she opted for surgery only after installation of an orthodontic appliance. Six months later, cone-beam computed tomography (CT) was performed (Fig. 2A, axial view; Fig. 2B, coronal view; Fig. 3, oblique view of 3D volumetric image).

The surgery was performed under general anesthesia using an extraoral approach and preauricular access. The tooth was successfully removed, with no perioperative complications, and her postoperative course was uneventful (Fig. 4, panorama view in cone-beam CT). A 3-year postoperative radiograph showed satisfactory bone healing.

### Discussion

The second premolar is one of the last mandibular permanent teeth to erupt in the mouth. Eruption failure itself accounts for approximately 24% of all dental impactions (9) and results in aesthetic and masticatory problems. Few studies have investigated distal migration



**Fig. 3** Oblique view of a 3D volumetric cone-beam CT image shows the crown of the impacted tooth partly covered by bone.



**Fig. 4** A panoramic cone-beam CT image at 1 week postoperatively.

of unerupted mandibular second premolars (1,2,4,5-10). A search of English-language studies in the PubMed and Medline databases revealed 10 cases of ectopic mandibular second premolars involving the condylar or subcondylar region from 1968 to 2010. The cause of intraosseous migration remains unclear. Theories regarding the pathogenesis of this condition include early loss of the mandibular first molar, abnormal angulation of the tooth buds of the second premolars (1), and even adventitious development (4), but evidence is limited.

Previous case reports of second premolars in the subcondylar area and condyle show that females are predisposed to this migration, which occurs mostly in adults older than 20 years (1-3). Our patient remained asymptomatic until the tooth reached the ramus, at which point she started to feel increasing discomfort, pain, and difficulty in mastication. Her symptoms were similar to those noted in previous reports of ectopic teeth in this region.

The series of panoramic radiographs obtained from our patient during her visits show the migratory path of the tooth across the mandible and the direction of its long axis, namely, the crown was in a superior position and moving toward the condyle. In previous cases, the premolar moved horizontally to the mandibular notch, mandibular angle, coronoid process, ramus, and condyle, with the crown in an upward position. Throughout this course, the tooth moved below the inferior alveolar canal, with no pathologic or morphologic change in surrounding bone. Some reports described a path where premolars migrated inferiorly to the roots of molars but above the canal (1,8).

Cone-beam CT is a widely accepted tool in dental diagnosis, and several studies have confirmed its accuracy

and reliability. In our patient, cone-beam CT was used to assess the position and orientation of the impacted tooth and allowed its precise description on all three spatial planes. The 3D information provided by the scan facilitated accurate surgical management and helped improve patient care.

Early detection and intervention of migration of the mandibular second molar can spare patients more complex treatment and injury to the mandible. To our knowledge, the present case is the first to include sequential radiography of distal migration of the second premolar in the mandible. The images afford an exceptional opportunity to observe the tooth path in the mandible.

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