CASE REPORT

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# Incidental finding of impacted supernumerary teeth in cone-beam computed tomography 3D

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## ABSTRACT

**Objectives:** To evaluate the value of cone-beam CT (CBCT) in the diagnosis and orientation of impacted supernumerary teeth in the dental arches.

**Case Report:** A 50 year old man came to the Udayana University Hospital with the chief complaint of missing bilateral posterior teeth of the mandible and wanted to make denture. Before the treatment begin, a panoramic radiographic examination was performed. The panoramic image shows an impacted supernumerary teeth on the inferior from lower right premolar. Due to the inability to determine the precise position of those teeth within the mandible and the possible vital structures surrounding, a CBCT imaging was taken. Examination of the images from the CBCT shows an impacted supernumerary teeth in the area of teeth 44 and 46.

**Conclusion:** The position of the supernumerary teeth is varied in the mandible, and often causes permanent dentition complications. In this case CBCT imaging two supernumerary teeth were found in the tooth area 44-45 and 45-46. apical of the two germ teeth appear to be fully formed. Supernumerary crowns between teeth 44-45 inclined buccally & between teeth 45-46 lingually. CBCT is crucial for exact localization, for treatment planning, and for the surgical approach in cases of multiple supernumerary teeth.

***Keywords:*** *Cone-beam computed tomography, impacted teeth, supernumerary teeth*
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## INTRODUCTION

Supernumerary teeth are additional teeth from the number of teeth that should be. These teeth can be located anywhere in the maxillary or mandibular arches, and occur singly or in multiples and are unilateral or bilateral.[1] The exact etiology of supernumerary teeth is unclear but many theories exist in an attempt to explain why extra teeth are present in some individuals. Supernumerary teeth show strong association disorders such as cleft lip and palate, cleidocranial dysostosis, Gardener syndrome and less commonly with Ehlers-Danlos syndrome, Fabry Anderson's syndrome, chondroectodermal dysplasia.[2] The incidence of supernumerary teeth is more common in permanent teeth, especially in the area of maxillary incisors, maxillary third molars and mandibular molars, premolars, canines, and lateral incisors.[2-3]

When supernumerary teeth are discovered, a decision regarding the fate of supernumerary teeth must be made. An important part of the decision process is determining the precise location of the supernumerary teeth. Because supernumerary teeth can cause delayed/impeded eruption of teeth, root resorption, and/or inability to properly orthodontically move teeth into proper position, most supernumerary teeth should be removed prior to orthodontic treatment.[5,7] Comprehensive treatment plan must be supported adequate radiographic examination.[1] CBCT has been shown to provide superior three dimensional imaging to "plain films" and provide the doctor with precise anatomic truth in determining the location of impacted teeth.[4-5] The objectives is to evaluate the orientation of impacted supernumerary teeth in the mandibular dental arch using CBCT.

## CASE REPORT

A 50 year old male patient came to Udayana University Hospital with chief complaint of missing right and left mandibular posterior teeth so he felt uncomfortable when chewing and wanted to have dentures made. Extraoral examination showed no abnormalities. Intraoral examination revealed missing teeth 35, 36 and 47, gangrene radix 22, acrylic denture on tooth 14, and post restoration with acrylic crown on tooth 11 (Figure 1). Panoramic radiographic examination showed two impacted supernumerary teeth in the right posterior region of the mandible on the inferior premolar (Figure 2). To ascertain the exact position of the two impacted supernumerary teeth and the

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vital structures surrounding, CBCT imaging was performed.

On CBCT 3D examination, two supernumerary teeth were found in the tooth area 44-45 and 45-46. apical of the two germ teeth appear to be fully formed. Supernumerary crowns between teeth 44-45 inclined buccally & between teeth 45-46 lingually. The crown distance to the alveolar crest on the first supernumerary tooth is 5.81 mm and the second tooth is 6.52 mm. Because all the permanent teeth have grown, radiodiagnosis of supernumerary teeth areas 45 and 46 were chosen (Figure 3 and 4).

## DISCUSSION

The morphology variation in tooth structure involving crown or root had been reported many times in literature.[6] This condition can be asymptomatic and unintentionally discovered in routine radiographic examination. As mentioned in this case report, two supernumerary teeth was identified between apical tooth 44 and 45. This is a rare incident because supernumerary tooth often found in the maxillary incisors region .[2] A study by Jung, YH *et al*. found that most supernumerary tooth in maxillary incisors region cause a complication such as tooth impaction and displacement of the permanent incisors.[7] Some studies stated that supernumerary tooth is formed from the production of a group epithelial cells from the dental lamina connected by teratogenic or genetic impulse. Stimuli aspect and regulator are derivates of dental lamina and or papilla, allowing these cells to develop into tooth structure.[8]

In this case, the supernumerary tooth was found incidentally because the patient was doing a radiographic examination in preparation for making a denture. Panoramic radiograph is one of an adjunctive examination that can help to discover supernumerary tooth.[9-10] However, panoramic radiograph still have some limitations such as geometric distortion and superimposition, and the

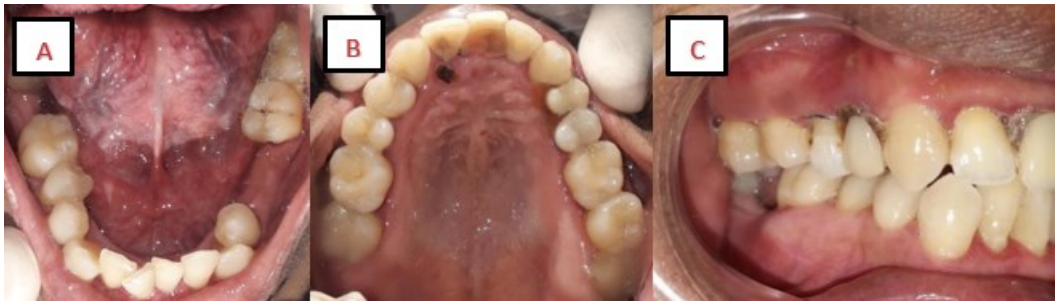


**Figure 1.** Clinical photographs of the patient, (A) Mandible occlusal view, (B) Maxilla occlusal view, (C) Intraoral images of the right side

**Figure 2.** Panoramic image shows two impacted supernumerary teeth in the right posterior region of the mandible

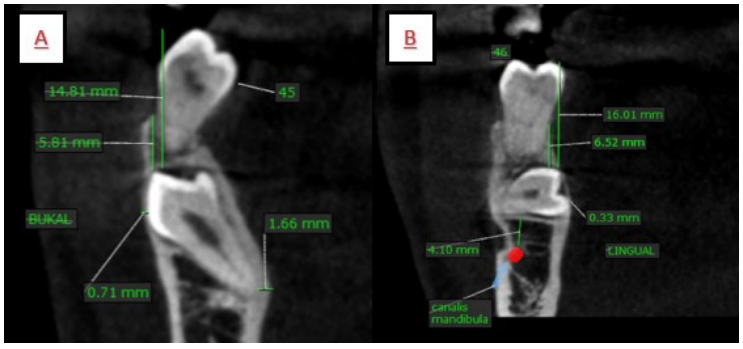


**Figure 3.** CBCT coronal views, (A) the impacted tooth located at tooth 45 from coronal view is shifted towards the mesial and buccal side and is not connected to the mandibular canal, (B) the impacted tooth is located in the mesial and lingual area of tooth 46 and is not associated with the mandibular canal

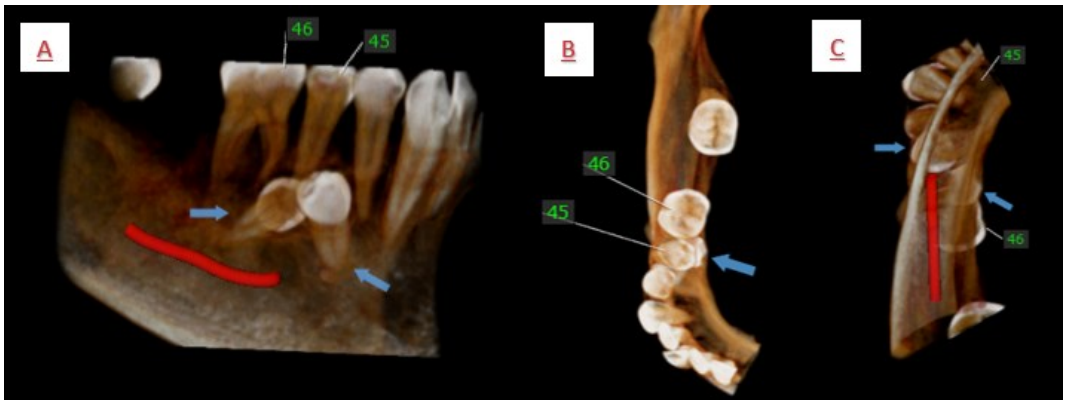


**Figure 4.** 3D CBCT images, (A) buccal view, (B) Occlusal View, and (C) apical View

image can not give accurate evaluation of the supernumerary tooth morphology, location and the relationship to the vital structure around it such as maxillary sinus and inferior alveolar canal.[11] As in the case, panoramic radiography only show the position of the supernumary teeth on the inferior of lower right premolars but cannot identify the direction of tooth growth and the distance between the tooth crown and the alveolar crest.

Cone-Beam Computed Tomography (CBCT) is a high quality radiographic image system use for diagnostic tool, it present an accurate 3 dimensional image, and able to give images of bone elements in the maxilla. CBCT can visualize impacted tooth position and give image with the surrounding structures like a mandibular canals and teeth around it.[12] In this case report, it was shown that CBCT technique is able to identify the position of the supernumerary tooth between the area of tooth 44 and 45 and also visualize the surrounding structures and supernumerary teeth do not displace the teeth above them. Other than that, CBCT can also be used to managing treatment plan and the prognosis of the treatment because of its high accuracy.[11]

Supernumerary teeth can be classified based on: (1) morphology having type (a) Conical; (conussmall); usually peg-shaped are teeth supernumerary which is often found between permanent teeth. (b) Tuberculate: usually teeth this type has more than one cusp or tubercles and often described as barrel-shaped and invaginate. (c) Supremental, on the Supplemental type; is duplication of normal teeth. Based on Location; some are called Mesiodens, namely teeth that growing between the two central incisors; Also Distomolar; supernumerary teeth that grow in location most distal of the third molar arch; And Paramolars; supernumerary teeth are located between the teeth molar.[16] In the case, type of supernumerary teeth found are supplemental because the shape of these teeth is like normal teeth and in theory these teeth are indeed often found on maxillary lateral incisors, premolars and molars still.

The treatment for supernumerary tooth cases often done by surgical procedure and orthodontic treatment. Surgical - orthodontic management is done more properly by more accurate diagnosis dan identifying the exact location of each supernumerary tooth.[13] CBCT allow surgeons and orthodontist to evaluate the location of the impacted supernumerary tooth more accurately and predict the impact for the patient's orthodontic treatment.[14] Knowledge about the exact location of the impacted supernumerary tooth gives the surgeon better diagnosis and further more allow the surgeon to predict the risk and benefit from the surgery.[13,15]

## CONCLUSION

Supernumerary teeth are usually asymptomatic and are incidentally identified on panoramic radiographs. The position of the supernumerary teeth is varied in the mandible, and often causes permanent dentition complications. CBCT imaging yields accurate 3-dimensional pictures of supernumerary teeth, local dental and bony structures, which is helpful for diagnosis and orientation of supernumerary teeth. Cone beam computed tomography is crucial for exact localization, for treatment planning, and for the surgical approach in cases of multiple supernumerary teeth.

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None.

## FOOTNOTES

All authors have no potential conflict of interest to declare for this article. Informed consent was obtained from the patient for being included in this case report.

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