

## CASE STUDY

# Diagnosing pain of unknown origin in a young adult with high resolution CBCT

by Dr. Aditya Patney

As a high-resolution imaging tool, CBCT reveals intricate anatomy and even occult pathology, making it indispensable in diagnostic assessments. In this clinical case, Dr. Aditya Patney reports on the role high-quality 3D imaging plays in diagnosing the cause of pain when clinical and a conventional radiographic work-up did not lead to closure.

## CASE

A 29-year-old male was referred for a CBCT scan of the anterior maxilla to diagnose the cause of pain in the upper front teeth on the left side, which had been present for the past few days. There was an associated palatal swelling but no obvious cause for the pain. Any caries or prior fillings with recurrent caries, or past history of trauma, was evident or causative. A PA radiograph of tooth #22 with sinus tracing through the palatal swelling was taken but could not establish the diagnosis.

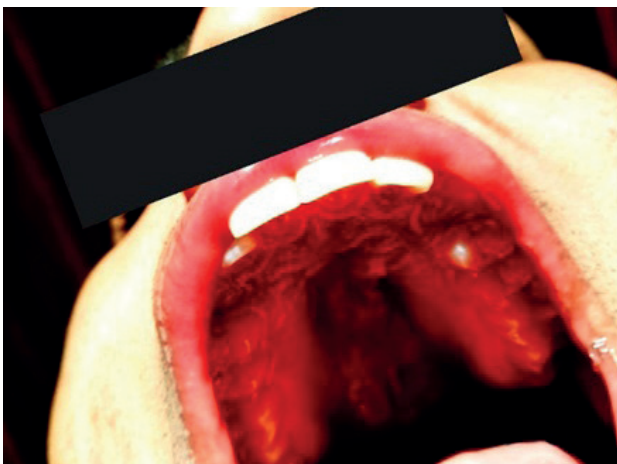


Fig. 1  
Photography of palatal swelling, taken by referring clinician.

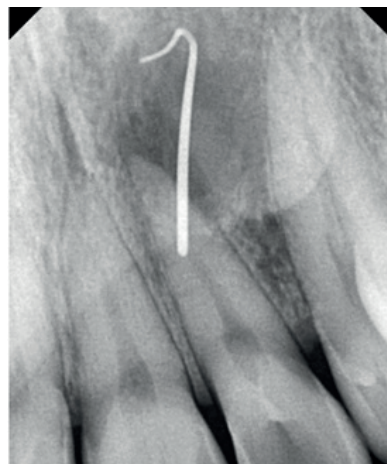


Fig. 2  
PA radiograph of #22 with sinus tracing but inconclusive for etiology.

## THE ROLE OF CBCT IN DIAGNOSIS

A high-resolution CBCT scan of the anterior maxilla was performed using the CS 9600 CBCT system with a voxel size of 75 microns.

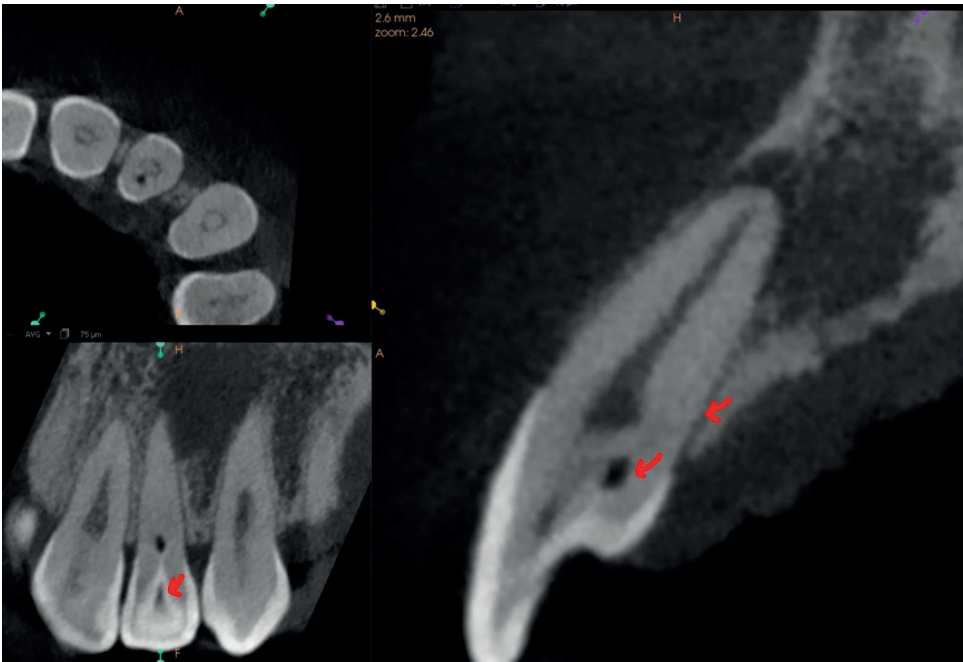


Fig. 3  
A multiplanar view of #22 with enlarged sagittal to show the invagination course.

On the CBCT scan, Oehler's type III Dens Invaginatus was observed in tooth #22 and the same communicated laterally with the PDL through a pseudo-foramen by a faintly visualized palatal extension. An open apex of the root of #22 was observed. Focal calcification of the coronal third of the main root canal was seen with the root canal space dilated in the middle third and well-visualized root canal calibre in the remainder of the root canal.

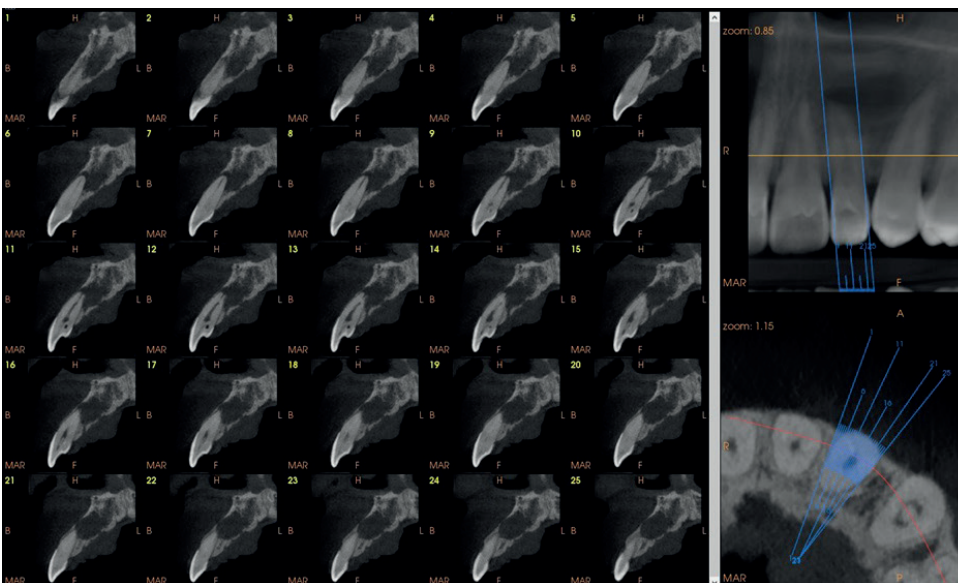


Fig. 4  
Thin cross sections of #22.

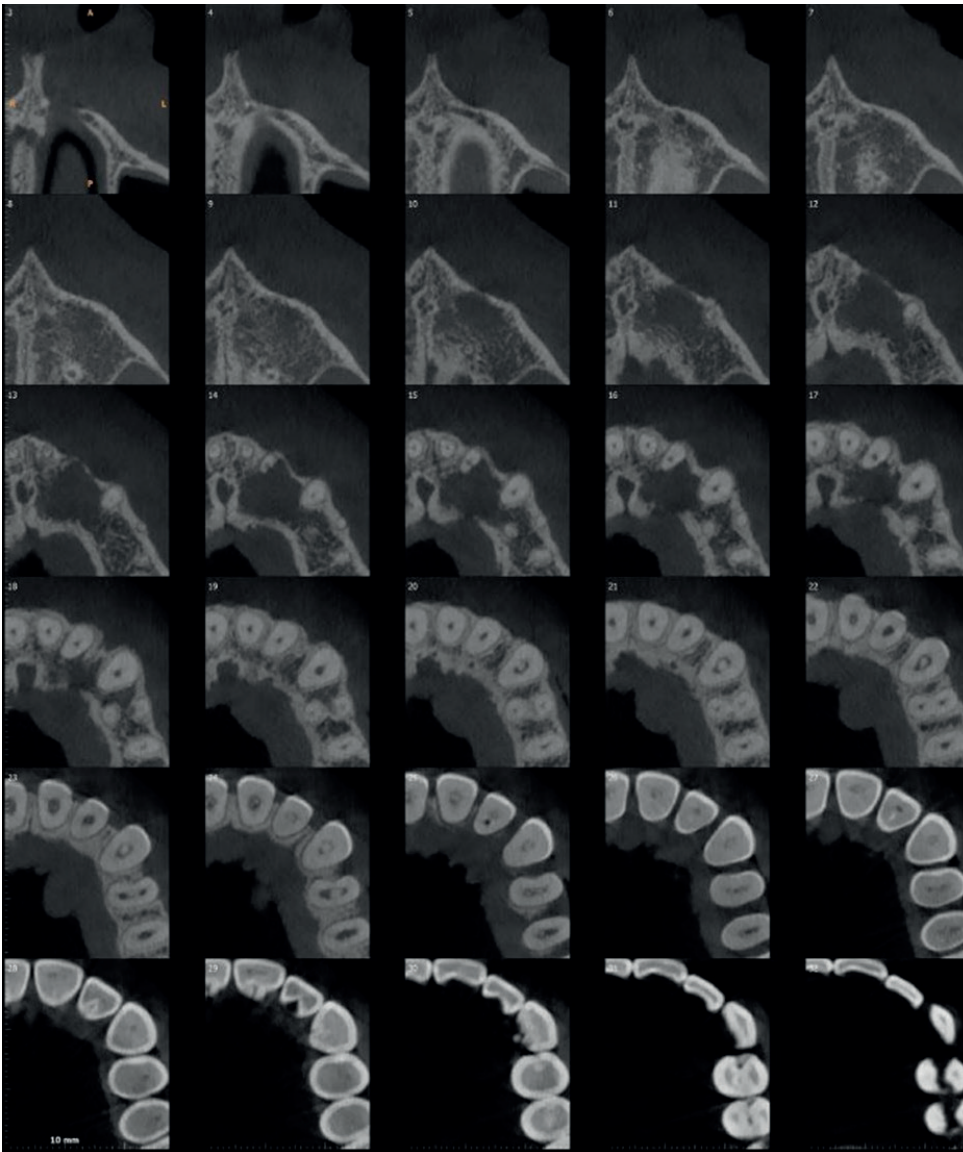


Fig. 5  
Axial CBCT images with  
extent of periapical lesion  
in view.

A well-defined periapical lesion of dimensions 1.3cm (AP) x 1.0cm (TR) x 1.3cm (CC) was observed in the #22-23 region with mild expansion and thinning of cortical bone. There was significant focal thinning/erosion of the palatal bone in the #23 region with contiguous palatal soft tissue thickening. The lesion was limited below the floor of the nasal fossa. These CBCT findings indicated diagnosis of a chronic periapical lesion (periapical cyst with secondary infection/chronic periapical abscess) involving the #22-23 region secondary to DI in #22.

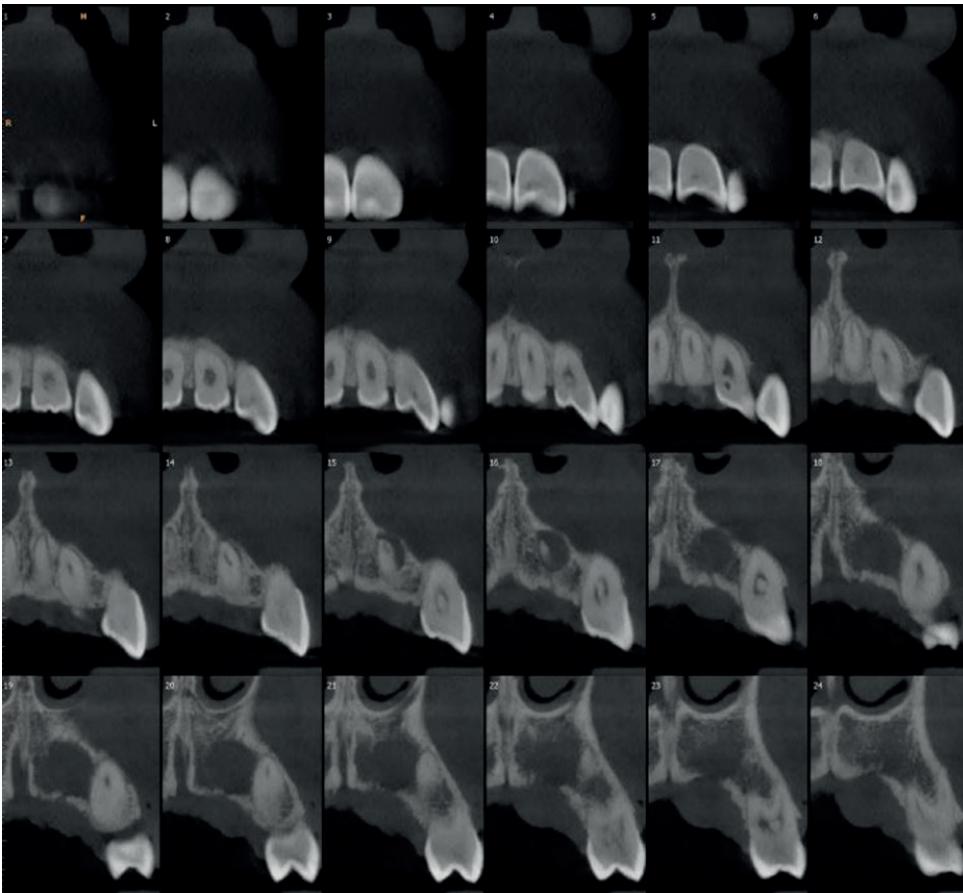


Fig. 6  
Coronal CBCT images with  
extent of periapical lesion  
in view.

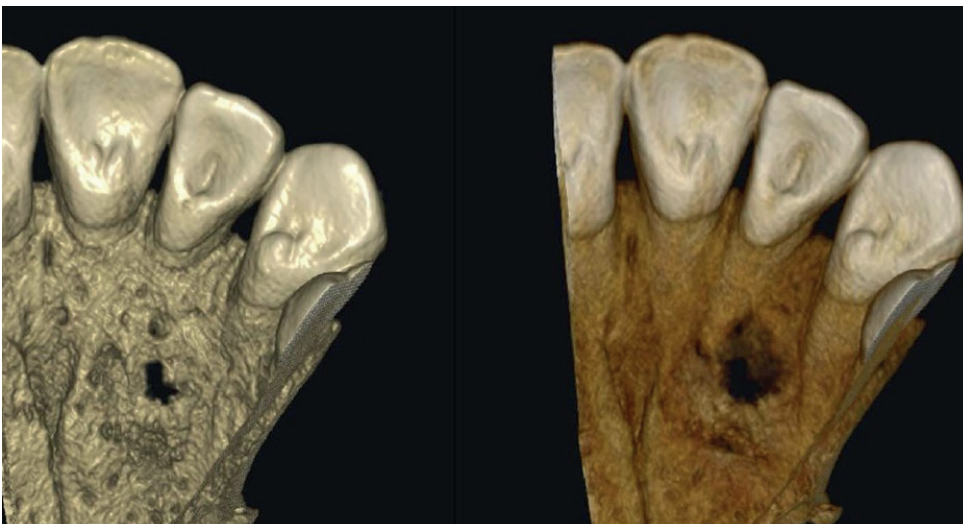


Fig. 7  
Cropped 3D volume  
rendered image.

## DENS INVAGINATUS

Dens Invaginatus is a dental malformation that poses diagnostic difficulties in the clinical context. Compared to conventional radiographs, three-dimensional images obtained with cone beam computed tomography (CBCT) are invaluable in the diagnosis of the extent of this anomaly and in appropriate treatment planning. Oehler's classification (1957) for dens invaginatus (DI) falls under three types depending on the depth of the invagination.

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Of the three types, Type III DI is characterised by infolding of the enamel into the tooth up to the root apex and is considered the most severe variant of DI, and hence the most challenging to treat endodontically due to the morphological complexities. This report describes a case of Oehler's Type III DI in the maxillary lateral incisor in which CBCT images played a key role in diagnosis and treatment planning.



CS 9600 5-in-1 CBCT system, high precision with the least voxel size of 75 microns is used by Dr. Patney in his clinic in Delhi, India

## CONCLUSION

Next steps should be endodontic treatment directed to the etiology (#22) and for which post-treatment follow up imaging should be considered in view of the aberrant anatomy as diagnosed on CBCT.

This case underscores the importance of prudent selection of the CBCT scanning protocol; careful reading of the scan volume (as the invagination was barely perceptible even at the highest possible resolution CBCT); and also the importance of looking for any subtle changes on a CBCT scan, which is an imaging modality laden with intricate anatomy and occasionally occult pathology. The crucial role of CBCT in the diagnostic workflow of this case cannot be underestimated.

## DR. ADITYA PATNEY CURRICULUM VITAE

Aditya Patney, BDS, MDS (Oral Medicine, Diagnosis & Radiology), is a Consultant Oral & Maxillofacial Radiologist, currently heading the Department of Dentomaxillofacial Imaging at Mahajan Imaging, SDA Centre, New Delhi, since 2012, and at Mahajan Imaging's Defence Colony Centre since its inception in 2013.

He has been actively involved in several educational and charitable initiatives, including the American Academy of Implant Dentistry's (AAID) Maxicourse program in New Delhi (2012), training for students preparing for Canadian dental residency exams, and several other institutes where he teaches basic oral radiology to general dentists. Additionally, he contributes to Smile India, a charitable organization providing dental care to underprivileged and deprived children.



## REFERENCE

National Library of Medicine

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4812223/#:~:text=Oehler's%20Type%20III%20Dens%20Invaginatus%20as%20reported%20in%20this%20case,foramen%20%5B1%2C%208%5D.>