**Article type:** Perspective
**Home Page URL:** https://www.alliedacademies.org/trauma-and-critical-care/

# Three-Dimensional Imaging in the Diagnosis and Management of Jaw Cysts and Tumors.

**Michael J. Harris ***

Department of Oral & Maxillofacial Surgery, University of California, San Francisco, USA

***Correspondence to:** Michael J. Harris. Department of Oral & Maxillofacial Surgery, University of California, San Francisco, USA. Email: michael.j.harris@email.com

***Received:*** *27-May-2025, Manuscript No. AAOMT-25-169575;* ***Editor assigned:*** *01-Jun-2025, PreQC No. AAOMT-25-169575 (PQ);* ***Reviewed:*** *15- Jun-2025, QC No. AAOMT-25-169575;* ***Revised:*** *22- Jun-2025, Manuscript No. AAOMT-25-169575 (R);* ***Published:*** *29- Jun-2025, DOI:10.35841/AAOMT-8.1.187*

## Introduction

The accurate diagnosis and effective management of jaw cysts and tumors remain essential components of oral and maxillofacial surgery. These lesions, ranging from benign odontogenic cysts to aggressive neoplastic growths, can cause significant functional and aesthetic complications if left untreated. Traditionally, two-dimensional imaging modalities such as panoramic radiography have been used for preliminary assessment. However, these methods often present limitations, including distortion, overlapping anatomical structures, and difficulty in accurately determining lesion extent and relation to adjacent vital structures [1, 2, 3, 4, 5].

Three-dimensional (3D) imaging technologies, such as cone-beam computed tomography (CBCT) and conventional computed tomography (CT), have revolutionized maxillofacial diagnostics by providing volumetric data and multiplanar reconstructions. These modalities offer unparalleled visualization of lesion borders, cortical bone involvement, and internal architecture, enabling precise preoperative planning and improved surgical outcomes. Furthermore, 3D imaging facilitates better communication between clinicians and patients, as volumetric renderings can illustrate disease severity and expected surgical interventions. The integration of 3D imaging into clinical practice has therefore significantly enhanced both diagnostic accuracy and treatment predictability for jaw cysts and tumors.

## Conclusion

Three-dimensional imaging has become an indispensable tool in modern oral and maxillofacial diagnostics, bridging the gap between clinical examination and definitive surgical planning. By offering detailed spatial information and minimizing diagnostic uncertainty, CBCT and CT imaging contribute to more conservative and targeted surgical approaches, reduced morbidity, and improved patient satisfaction. As technology advances, the role of 3D imaging will likely expand further, incorporating artificial intelligence–assisted interpretation and real-time surgical navigation to enhance precision in managing jaw cysts and tumors.

### References

1. Ariji, Y., Gotoh, M., Kimura, Y., Naitoh, M., Kurita, K., & Ariji, E. (2014). Imaging features contributing to the diagnosis of ameloblastomas and keratocystic odontogenic tumors: A comparative study using cone-beam computed tomography. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology, 118*(4), 477–486.
2. Guerrero, M. E., Jacobs, R., Loubele, M., Schutyser, F., Suetens, P., & van Steenberghe, D. (2006). State-of-the-art on cone beam CT imaging for preoperative planning of implant placement. *Clinical Oral Investigations, 10*(1), 1–7.
3. Kamburoğlu, K., & Kursun, S. (2010). A comparison of the diagnostic accuracy of

CBCT and conventional panoramic radiography in the detection of simulated jaw cysts. *Dentomaxillofacial Radiology, 39*(8), 467–475.
4. MacDonald-Jankowski, D. S. (2010). Keratocystic odontogenic tumour: Systematic review. *Dentomaxillofacial Radiology, 39*(8), 455–467.
5. Scarfe, W. C., & Farman, A. G. (2008). What is cone-beam CT and how does it work? *Dental Clinics of North America, 52*(4), 707–730.

**Citation:** Harris M J. Three-Dimensional Imaging in the Diagnosis and Management of Jaw Cysts and Tumors. *J Oral Med Surg*. 2025; 8(1):187