CASE REPORT

Jurnal Radiologi Dentomaksilofasial Indonesia April 2025, Vol. 9, No. 1: 19-22
P-ISSN.2685-0249 | E-ISSN.2686-1321

OPEN ACCESS

http://jurnal.pdgi.or.id/index.php/jrdi/index

Post biopsy evaluation of mucoepidermoid carcinoma excision on maxillary using CBCT: a case report

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ABSTRACT

Objectives: The purpose of this case study is to report the postoperative evaluation of a case of Mucoepidermoid Carcinoma occurring in the maxilla using CBCT.

Case Report: A 44-year-old woman came to the Dental Radiology Installation of the Padjadjaran University Dental and Oral Hospital with complaints of swelling in the right maxillary region since 1 year ago accompanied by pain and could not open her mouth. The patient brought a referral letter for CBCT photos with a clinical diagnosis of Maxillary Tumour Dextra Post Biopsy Excision in the Maxillary Dextra region with HPA Mucoepidermoid Carcinoma a.r Maxillary Dextra. CBCT results showed tooth loss in areas 16, 17, and 18 accompanied by trabeculae loss at the posterior alveolar process support and partial bone thinning at the maxillary tuberosity. The loss of some hard tissue was likely part of the tissue taken for biopsy. The average density in these areas was ± 49 HU.

Conclusion: Lesions can be analysed using qualitative and quantitative methods with 3D CBCT.

Keywords: *Mucoepidermoid carcinoma, maxilla, CBCT*
Cite this article: Fauziyah E, Pamungkas ASB, Cahyareni F, Hanafi EY, Gustianto Y, et al. *Post biopsy of mucoepidermoid carcinoma excision on maxillary using CBCT: a case report.* Jurnal Radiologi Dentomaksilofasial Indonesia 2025;9(1)19-22. https://doi.org/10.32793/jrdi.v9i1.1294

INTRODUCTION

The salivary glands consist of three main glands: the parotid, submandibular, and sublingual glands, and hundreds of small, diffuse glands in the first part of the respiratory system. Salivary gland tumours are rare. According to the WHO classification in 2017, salivary gland tumours are classified into more than 30 benign and malignant histopathological subtypes. The wide histopathological spectrum and significant differences in prognosis distinguish salivary gland tumours from neoplasms of other organs.[1]

Salivary gland tumours account for approximately 3-4% of all head and neck tumors. They increase especially after the age of 50 years, and the incidence rises to above 7/100,000 by the age of 70 years. About 80% of the tumours are benign, and most are seen in the parotid gland. In many studies, the most commonly seen benign and malignant tumours are reported as pleomorphic adenoma and mucoepidermoid carcinoma.[1]

Mucoepidermoid carcinoma (MEC) is the most frequent malignant tumour of the salivary glands, accounting for approximately 5% of all malignant tumors. More than half of these cases involve the major salivary glands, especially the parotid glands at 30%.[2] MEC can occur in major and minor salivary glands and other organs such as the lungs, sinuses, and larynx. In the oral cavity, mucoepidermoid carcinoma often resembles a mucocele. It is more common in the mandible than in the maxilla. This tumour affects women and is rare in the first decade of life.[3]

Mucoepidermoid carcinoma (MEC) can occur in various sites, but is rare in the maxilla. MEC of the maxilla is commonly diagnosed in young to middle-aged patients with variable presentation, ranging from asymptomatic to symptomatic swelling associated with invasion of surrounding tissue.[4] The lesion may appear as a firm mass and sometimes has a blue or even red colour due to the presence of involved blood vessels.[5]

A radiographic examination is a supporting examination intended to help establish a diagnosis, treatment plan, and evaluation after treatment in dentistry.[6] Conventional radiographs are still reliable, although limitations exist, such as the superimposition of anatomical structures. This occurs because conventional radiographs display a two-dimensional image of a three-dimensional object.[7]

Cone Beam Computed Tomography (CBCT) is one of the most significant technological advances in dentomaxillofacial imaging. Suppose conventional radiography provides two-dimensional imaging that cannot provide axial, coronal, and sagittal plane information. In that case, CBCT radiography can provide three-dimensional images that accurately describe craniofacial structures,

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Received on: October 2024
Revised on: February 2025
Accepted on: April 2025

including the anatomical structure of the patient's oral cavity, face, and jaw.[8,9] In this case, CBCT can be used to determine the diagnosis, treatment plan, and post-treatment evaluation. This case report describes the postoperative evaluation of mucoepidermoid carcinoma in the maxilla using CBCT.[10]

CASE REPORT

A 44-year-old woman on October 20, 2020, came to the Padjadjaran University Dental and Oral Hospital with complaints of swelling in the right maxillary region, accompanied by pain, and could not open her mouth. The swelling lasted 1 year starting from September 2019 with a suspected clinical diagnosis of Maxillary Tumour Dextra, and on the results of the CBCT radiographic examination, there were missing teeth in areas 16, 17, and 18, accompanied by loss of trabeculae in the posterior alveolar process support and thinning of some of the bone in the maxillary tuberosity. The loss of some hard tissue was likely part of the tissue taken for biopsy. The average density value in these areas was ± 49 HU.

The results of histopathological examination of the extramaxillary preparation were coated with stratified flat epithelium, the nucleus within normal limits. Subepithelial cells were round, oval to polygonal, partially glandular. Nuclei pleomorphic, hyperchromatic, partially vesicular with clear daughter nuclei, mitoses found (<4/10 HPF), cytoplasm partially eosinophilic, partially bright. Fibrocollagenous connective tissue stroma, including hyaline degeneration with inflammatory cells of lymphocytes and histiocytes accompanied by dilated blood vessels. There was no perineural invasion or necrosis. There were also acini and ductuli of salivary glands of tubular shape lined with thoracic epithelium, nuclei within normal limits.

On November 9, 2023, the patient came back to RSGM Unpad for post-biopsy CBCT photos and excision results obtained for HPA mucoepidermoid carcinoma in the maxillary region. The results of the CBCT examination obtained a picture of edentulous ridge in regions 14, 15, 16, 17, and 18, and there was no abnormality in the dextra maxillary region.

DISCUSSION

Mucoepidermoid carcinoma is a malignant epithelial tumour of mucus-secreting, epidermoid, and intermediate cells, forming cysts and solid islands. Mucoepidermoid carcinoma (MEC) was first described by Volkmann in 1895. Later, Stewart et al. (1945) defined such lesions as "mucoepidermoid tumors" and identified tumours with "relatively

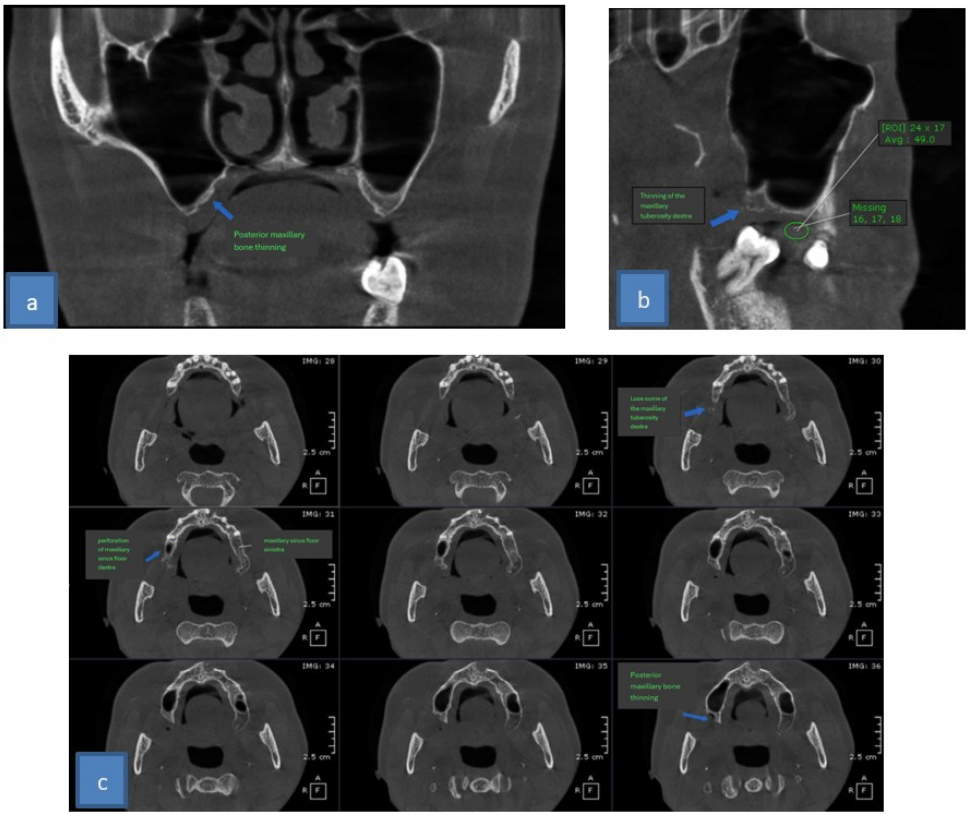

Figure 1. Post-biopsy CBCT. a. Axial slice , thinning of trabeculae on the posterior dextra maxillary base (blue arrow). b. Sagittal slice. Edentulous ridge in regions 16, 17, and 18 with complete loss of trabeculae at the posterior process alveolaris (blue arrows in sagittal slice views) and bone thinning at the maxillary tuberosity. The average density of the area is 49 HU, indicating an area with mass close to soft tissue density. c. Axial Sliced View. Partial perforation of the inferior wall of the maxillary sinus dextra is seen. Missing teeth 16, 17, and 18 are seen with trabeculae loss at the posterior process alveolaris dextra and thinning at the maxillary tuberosity.

Figure 2. Post biopsy and excision. a. front view extra oral photograph, b. right side view. c. Intraoral view of the right maxilla.

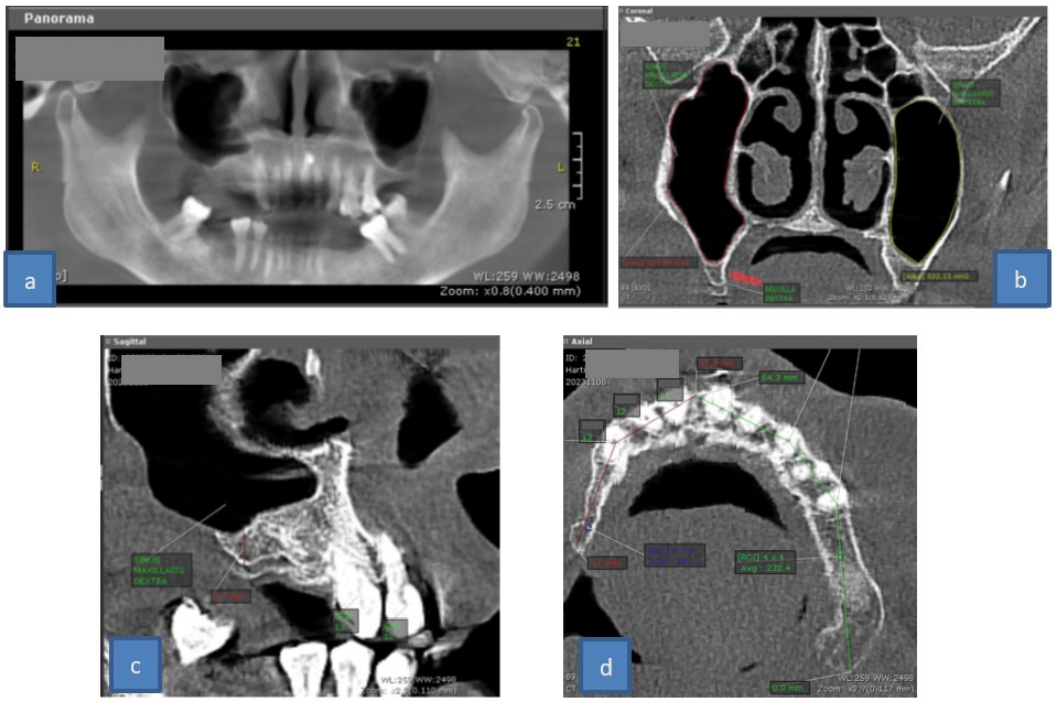

Figure 3. Post-biopsy and excision CBCT. No lesion is seen in the alveolar bone of the extra maxilla a. Panoramic. b. Coronal section. The area of maxillary sinus dextra +/- 614.06 mm2 is larger than that of maxilla sinistra +/- 522.13 mm2. c. Sagittal section. The distance between the apex of the alveolar bone of the dextra maxilla and the maxillary sinus is +/- 5.7 mm. d. Axial Section. Measurement of alveolar bone density in the dextra maxilla resulted in 231.1 HU, and alveolar bone density in the sinistra maxilla resulted in 232.4 HU. The dextra maxilla was +/- 37.8 mm in length, shorter than the sinistra maxilla by +/- 64.3 mm.

favourable" and "very unfavourable" clinical outcomes. It was further found that tumours classified as benign produced metastases. Therefore, all mucoepidermoid tumours are considered carcinomas.[11,12] Mucoepidermoid carcinoma has varying degrees of aggressiveness, with low-grade generally having a good prognosis and high-grade being more aggressive and having a worse prognosis.[13]

The predilection of mucoepidermoid carcinoma is more common in women than men and is more common in the maxilla. Approximately 89% of cases are found in the parotid, followed by 8.4% in the submandibular glands and 0.4% in the sublingual glands, with predilection mostly in the 4th–5th decades[14]. Mucoepidermoid carcinoma is most common in the parotid gland and usually presents as an asymptomatic swelling. Most patients notice the lesion at one year or less, although some report many years of duration. Complaints may include pain, ulceration, or facial nerve injury. Usually associated with high-grade tumors. The minor salivary glands are the second most common site, especially in the palate region. Small glandular tumours also typically present as asymptomatic swellings that sometimes fluctuate, are blue or red, and can be clinically mistaken for mucoceles. The lower lip, mouth floor, retromolar pad, and tongue are frequent sites of salivary gland neoplasia, including mucoepidermoid carcinoma.[13,15]

Cone Beam Computed Tomography (CBCT) was first invented in 1977 in Italy and commercially developed in the 1980s.[15] CBCT has an X-ray source and a detector mounted on a rotating device. A divergent pyramid or cone-shaped ionising radiation source is directed at the centre of the object and leads to an X-ray detector that is mounted in the opposite direction from the patient's side and will rotate on its fulcrum around the object. As the device rotates, it produces hundreds of image fragments, which, when put together, become a three-dimensional image of the object.[10,16]

The advantages of CBCT compared to CT are that both provide detailed and accurate three-dimensional images of anatomical structures, pathological conditions, and anomalous developmental growth, but CBCT provides a lower dose compared to CT, in addition to a shorter exposure time of about 10-70 seconds and easy data transfer[17]. CBCT provides a three-dimensional view of hard tissue anatomy, namely coronal, sagittal, and axial. This makes it possible to see the anatomical structure in each slice with adjustable observation angles.[18]

In radiographic images of both CT and MRI, low-grade mucoepidermoid carcinoma displays a picture of a well-defined heterogeneous mass with sharp boundaries, and high-grade, which leads to malignancy, shows less well-defined boundaries. In panoramic and CBCT as a supporting examination, it is done to determine bone involvement in the mandible or maxilla.[19] In this case, CBCT examination was performed post-biopsy and excision to evaluate the mucoepidermoid carcinoma's size and effect on the surrounding tissues' anatomical structure. The first CBCT examination showed trabeculae thinning at the base of the posterior dextra maxilla (Figure 1.a), edentulous ridges at regions 16, 17, and 18, complete trabeculae loss at the posterior process alveolaris, and bone thinning at the maxillary tuberosity (Figure 1.b). The average density of the area was 49 HU, indicating an area with mass close to soft tissue density. The second CBCT examination showed no lesion in the extra-maxillary region.

CONCLUSION

Mucoepidermoid carcinoma is a malignancy of the salivary gland that gives a typical picture consisting of mucinous, intermediate (clear cells), and squamous tumour cells that form a cystic and dense pattern. CBCT is an advanced radiographic modality that displays three-dimensional images with low dose and time efficiency compared to CT.

ACKNOWLEDGMENTS

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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