

## CASE REPORT

# Clear Cell Odontogenic Carcinoma of the Mandible: Diagnostic Difficulty and Therapeutic Dilemma

<sup>1</sup>Shivakumar Thiagarajan, <sup>2</sup>Sajith Babu, <sup>3</sup>Hamsa Nandini, <sup>4</sup>KP Kavitha

## ABSTRACT

Clear cell odontogenic carcinoma (CCOC) is a rare tumor commonly involving the mandible, in elderly women. It is locally aggressive with a tendency to spread to lymph nodes and also has distant metastasis. Until date, only about 100 cases have been reported in the literature. Here, we report one such case in a 60-year-old lady who presented with a nonhealing ulcer of the oral cavity following a tooth extraction. She underwent surgery followed by adjuvant radiotherapy and is on follow-up for over 6 months, free of disease. The CCOC must be considered as one of the differential diagnosis in tumors involving the jaw with a radiolucent lesion as seen on an orthopantomogram (OPG) and clear cell component histopathologically. We have also done a literature review of the reports published so far and the best possible treatment options have been discussed in the light of these evidences.

**Keywords:** Clear cell, Locally aggressive, Odontogenic carcinoma, Surgery.

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## INTRODUCTION

Clear cell odontogenic carcinoma is a rare tumor affecting the mandible most commonly.<sup>1</sup> Initially, it was thought to be a variant of ameloblastoma; hence, it was under-reported. But, Hansen et al<sup>2</sup> first described it as a separate entity, in which patients presented with local bony invasions without metastasis. Subsequently, it was also reported by Waldron et al.<sup>3</sup> Since then there have been about 100 case reports of the lesion with similar clinical and radiological presentations and histopathologic fea-

tures.<sup>4</sup> The histopathology of the reported lesions has a consistent pattern of clear cells. Various treatment modalities have been applied including surgery, radiotherapy, and chemotherapy. A clear consensus on the biological behavior and the most appropriate treatment modality is yet awaited. Here, we present a case of CCOC managed with surgery followed by adjuvant radiotherapy.

## CASE REPORT

A 60-year-old lady reported to the Department of Head and Neck Surgery of our institute with a history of a nonhealing ulcer and pus discharge from the lower jaw following extraction of a loose tooth 1 year back. She visited a dental college for the same 2 months prior, where a biopsy was done and it was reported as low-grade mucoepidermoid carcinoma. Orthopantomogram showed a large cystic lesion in the right body of mandible extending from premolar region to the coronoid process up to the inferior border of the mandible (Fig. 1). The patient had no significant past medical history. She claimed not to have any deleterious habits. None of her immediate family members suffered from any similar condition.

On local examination, a 2.5 × 1.5 cm ulcerative lesion was noted over the right lower alveolus, retromolar trigone, and lower gingivobuccal sulcus. No significant palpable cervical lymph nodes were noted.

The slides and blocks were reviewed by the pathologist from our institute as well, and based on that report, a working diagnosis of low-grade mucoepidermoid carcinoma (minor salivary glands) of lower alveolus



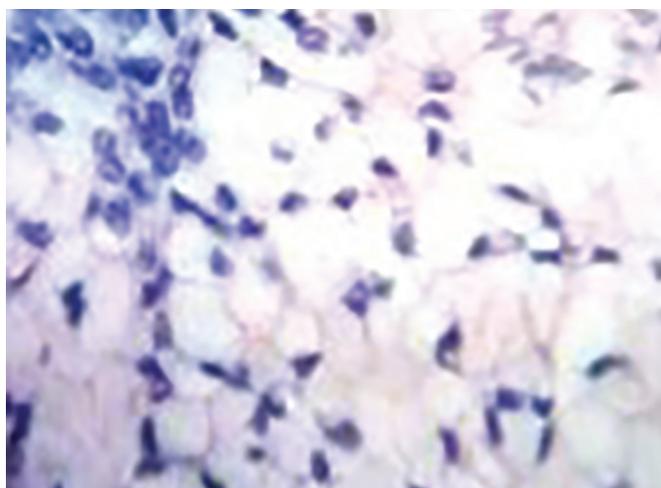
**Fig. 1:** The OPG showing the radiolucent lesion involving the right side of the mandible

<sup>1,2,4</sup>Associate Professor, <sup>3</sup>Fellow

<sup>1-3</sup>Department of Surgical Oncology, Malabar Cancer Centre Kannur, Kerala, India

<sup>4</sup>Department of Pathology, Malabar Cancer Centre, Kannur Kerala, India

**Corresponding Author:** Shivakumar Thiagarajan, Associate Professor, Department of Surgical Oncology, Malabar Cancer Centre, Kannur, Kerala, India, Phone: +919846572399, e-mail: drshiva78in@gmail.com



**Fig. 2:** Sheets of clear cells and nests of basaloid cells (arrow) (hematoxylin and eosin 40× magnification)



**Fig. 3:** Clear cells showing PAS-positive granules (PAS stain 40× magnification)

was made. Surgery was performed under general anesthesia, which included wide excision with right hemimandibulectomy, selective neck dissection (levels I–IV clearance) along with removal of sternocleidomastoid muscle. The defect was reconstructed with pectoralis major myocutaneous flap.

The surgical specimen was fixed in 10% buffered formalin. Right mandible on section showed an unencapsulated growth with irregular border measuring  $3.5 \times 1.5 \times 1.2$  cm. Cut surface of the tumor showed gray white granular appearance with cystic areas. Surface mucosa was ulcerated. Microscopically, the tumor exhibited a biphasic pattern with islands and sheets of clear cells, and nests and cords of basaloid cells with intervening fibrous stroma (Fig. 2). Clear cells showed well-defined cell borders and more or less centrally placed nucleus. Cells contained coarse diastase digestible periodic acid–Schiff (PAS)-positive granules (Fig. 3). There was no lymphovascular emboli or perineural invasion noted. Hence, a diagnosis of CCOC was made. All the dissected 27 lymph nodes showed reactive changes only.

The close differential diagnosis was intraosseous low-grade mucoepidermoid carcinoma. Differentiation was done using a special stain, which demonstrated the absence of mucin in the cells. Metastatic clear cell carcinoma was another differential, which was excluded by clinical evaluation.

She subsequently received adjuvant radiotherapy of 60 Gy/30# and is currently on regular follow-up for over 6 months now and is disease free.

## DISCUSSION

Little is known about the natural history of CCOC. Initially, it was thought to be a benign but locally invasive lesion. It was described as a clear cell odontogenic tumor, distinct from ameloblastoma. In 1992, this was listed in

the World Health Organization (WHO) classification as a benign tumor.<sup>5</sup> But, subsequent reports of frequent local recurrences and distant metastases (to lung and bone)<sup>6–8</sup> forced the reconsideration of this entity as an odontogenic carcinoma. Hence, in 2005, it was listed as a malignant tumor of odontogenic origin, in the WHO classification.<sup>9</sup> It is commonly seen in women, mostly in the 6th decade of their life, presenting commonly as a painless swelling of the jaws, frequently involving the posterior region of the mandible, with adjacent loosening of tooth.<sup>4,10,11</sup> The mandible is a frequently involved site (84%), while the maxilla is less commonly affected.<sup>1,12</sup> The lymph node metastasis at presentation is rare (<10%), but increases in recurrent cases (up to 33%).<sup>12</sup> Commonly, their radiological appearance is as a radiolucent expansile bony lesion, though a mixed radiolucent–radiopaque lesion has also been reported.<sup>13,14</sup> Histologically, they have biphasic, monophasic, and ameloblastomatous patterns. The biphasic pattern is the most common and ameloblastomatous the least common pattern. Biphasic pattern is characterized by nests of clear cells mixed with cells containing eosinophilic cytoplasm. In monophasic pattern, only clear cells are seen, whereas in ameloblastomatous pattern, nests of cells with central cystic changes, squamous differentiation, and peripheral palisading with reverse polarity are noted.<sup>15</sup> Head and neck tumors with clear cell histology have a wide spectrum of differential diagnosis. Diagnosis of CCOC is made by exclusion of other tumors. Their differential diagnosis includes tumors of odontogenic origin (ameloblastoma, calcifying epithelial odontogenic tumor), salivary gland origin (mucoepidermoid carcinoma, hyalinizing clear cell carcinoma), amelanotic melanoma, metastatic origin (kidney, thyroid, prostate), tumors arising from skin adnexa or mesenchymal structure, or may even be a fixation artifact.<sup>3,4,16</sup>

There are no clear-cut guidelines for the treatment CCOC yet. But, as it is evident from the case reports and series so far published in literature, surgery has been the mainstay of treatment.<sup>4,10</sup> Recurrence rates have been lower when surgery was the initial treatment. The overall recurrence rate for CCOC has been reported to be 55% and survival at 13 years is 21%.<sup>10</sup> Surgery ranging from resection with wide margins with or without neck dissection to curettage and enucleation has been reported. Wide excision with good margin is the recommended form of surgery for CCOC. Neck dissection is recommended whenever there is a palpable node or soft tissue invasion.<sup>10,17</sup> Adjuvant radiotherapy has been given, when there is a positive margin, nodal disease with or without extracapsular spread, perineural invasion, or extensive soft tissue invasion.<sup>18</sup> Role of chemotherapy is not clear. In the present case, after the histopathological diagnosis of CCOC was made, the role of adjuvant treatment was debated extensively in the institutional tumor board. A thorough literature review was done and in view of the extensive bone and soft tissue involvement, the decision to give adjuvant radiotherapy was taken.

## CONCLUSION

The CCOC is a rare malignancy of the jaw. It should be considered as one of the differential diagnosis in tumors arising from the jaw, especially mandible, with clear cell component and typical OPG finding of a radiolucent expansile bony lesion. Due to the limited number of cases being reported until date, there is unavailability of data regarding treatment (modality) efficacy and prognosis. However, the available data suggest that surgical treatment in the form of wide excision with adequate mucosal and soft tissue margin seems to be the best available treatment option, along with neck dissection in the presence of lymph nodes followed by adjuvant radiotherapy, if indicated.

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