

# Maxillofacial Radiology 202

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## CASE

A 30-year-old male patient, RVD-reactive on treatment, presented with a fast-growing, painful swelling involving the mandible of unknown duration. A panoramic radiograph (PR) and cone-beam computed tomography (CBCT) imaging were performed. What are the pertinent radiological features and your diagnostic hypothesis?



Fig. 1: Panoramic radiograph

## INTERPRETATION

The panoramic radiograph showed a poorly-defined, hazy and sclerotic appearance of the anterior mandibular bone. CBCT imaging showed a poorly-defined, hyperdense lesion resulting in a so-called "sunburst" periosteal reaction of the anterior mandible. This periosteal reaction extended to

involve the mandible bilaterally. These features supported the histopathological diagnosis of osteosarcoma.

Osteosarcomas are a group of malignant bone neoplasms that constitute approximately 50% of all skeletal malignancies, with 10% of cases occurring within the jawbones.<sup>1</sup> Osteosarcomas may arise de novo or following radiotherapy to the head and neck region.<sup>2</sup> They present with a near equal gender distribution and at a median age of 38 years, with males often presenting at an earlier age.<sup>3</sup> The mandible (56%), maxilla (32%), paranasal sinuses (10%), and the rest of the skull including the skull base (2%) are affected in decreasing frequencies.<sup>1</sup>

The most common presentation is that of a painful or painless swelling present for a short period.<sup>1</sup> Radiologically, they present as poorly-defined osteolytic, mixed or osteogenic lesions.<sup>2</sup> Periosteal reactions are common (65%) and may be laminated or spiculated.<sup>2</sup> Soft tissue invasion is seen in 48% of cases.<sup>1</sup> Treatment consists of primary surgical resection and neoadjuvant chemo- or radiotherapy in many cases.<sup>1</sup> The 5-year disease-free

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Fig. 2: (A) Axial, (B) sagittal and (C) coronal CBCT images

survival rate has been estimated at 60%<sup>3</sup>, with a median overall survival of 46 months.<sup>1</sup> Factors associated with a worse prognosis include patients over the age of 60 years, location other than the mandible, tumours larger than 6cm, histologic subtype, initial non-surgical therapy, and positive resection margins.<sup>3</sup>

It is the dentist's responsibility to recognise the early radiological signs, particularly mobile teeth with symmetrical widening of the periodontal ligament space in the absence of periodontal disease. This will ensure early patient referral and diagnosis, and improve overall survival rates.

#### Authors declaration

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#### Conflict of Interest

The authors declare that they have no conflict of interest.

#### Ethics approval

This study was approved by the University of Pretoria, Faculty of Health Sciences Research Ethics Committee (Reference no.: 411/2022). All procedures followed the

ethical standards of the Helsinki Declaration of 1975, as revised in 2008.

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## CPD questionnaire on page 444



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