

Diagnostic Imaging Review

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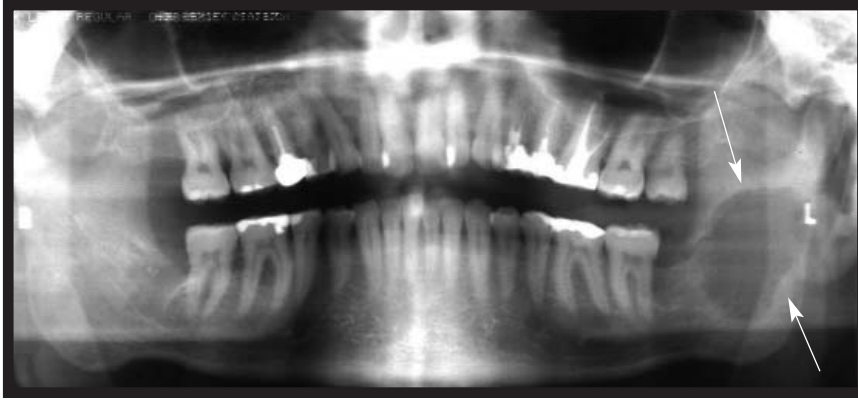


FIGURE 1. Panoramic radiography of the left lower jaw revealed a well-defined, 2×3-cm radiolucency.

Imaging focused on a tooth reveals an unusual mass

CASE

A 37-year-old man noted intermittent decreased sensation in his chin and lower lip with associated pain and swelling in his left lower jaw. He was planning to see his primary care physician (PCP) to have the symptoms evaluated when he fell off a ladder, injuring his neck and the side of his face. The patient went to the emergency department, where a series of cervical spine radiographs was performed and read as negative. The radiographs showed normal cervical curvature with preservation of the intervertebral disk spaces and no prevertebral soft-tissue swelling. Anti-inflammatory medications were prescribed, and the symptoms subsequently subsided.

About 2 weeks after the fall, the patient was shaving and noticed numb-

ness in his left lip along with minor left facial pain and slight swelling. Uncertain whether or not the symptoms were related to his fall from the ladder, he went to see his PCP for further evaluation. After a thorough examination, the PCP was unable to find a definitive cause of the symptoms and observed that they were suggestive of a dental pathology.

The patient consulted his dentist, who found an impacted wisdom tooth. Once the tooth was removed, the facial pain diminished and the patient regained most of the sensation to his lip and face. Approximately 1 week after the tooth extraction, however, the patient again experienced diminished sensation in his face and pain in the left jaw. He also noticed more pronounced swelling in his left lower jaw. When neither his PCP

nor his dentist was able to see him, the patient came to our urgent-care center.

Medical history revealed that 8 years earlier, the patient had had a sarcoma of the right knee. He underwent radical excision of the tumor followed by radiation therapy and has been disease-free ever since. The patient stated that he was allergic to codeine and was taking no medications. In addition, he denied using tobacco or alcohol and reported no history of radiation treatment to the head or neck region.

On examination, the patient was afebrile and vital signs were stable. There was no indication of respiratory distress. Mild facial swelling was apparent along the left lower angle of his jaw. During the oral examination, swelling was noted in the area where the wisdom tooth was removed, and the patient complained of pain when the area was palpated. No pus was expressed from the gums during palpation. There was no anterior or posterior adenopathy. The remainder of the physical examination was normal.

The patient was referred to an oral maxillofacial surgeon for same-day evaluation of the facial swelling. Panoramic radiography was performed (see Figure 1). **What does this image show?**

DISCUSSION

The radiograph revealed a residual root from the wisdom tooth. Also visible was a large radiolucency with diffuse non-corticated borders located in the ramus of the mandible just proximal to the area of the impacted third molar. The remainder of the tooth was removed, and a simultaneous biopsy of what appeared to be a solid mass lesion was performed. Pathologic examination yielded a diagnosis of Ewing's sarcoma. A thorough evaluation determined that there were no metastases; the cancer most likely represented a second primary lesion, not metastatic disease from the previous leg sarcoma.

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FIGURE 2. Initial radiograph of the spine was read as negative but on closer review demonstrated an area of lucency (arrows).

Ewing's sarcoma is the third most common bone tumor (incidence of 10%-15%) next to osteosarcoma (45%) and chondrosarcoma (20%-25%).¹ Approximately 225 new cases of Ewing's sarcoma are diagnosed each year in North America.² The tumor usually occurs during the second and third decade of life and has a slight predilection for men. Whites are more frequently affected than Asians or blacks.³

The Ewing's sarcoma family of tumors includes Ewing's sarcoma of the bone, extrasosseus Ewing's sarcoma, primitive neuroectodermal tumors (PNETs), and Askin tumors (PNETs of the chest wall).³ These tumors are often referred to as *small round blue cell tumors* because by light microscopy, they consist of small round cells that contain regular round nuclei, which stain blue and occupy almost the entire cell; a scant amount of cytoplasm; and tightly packed chromatin.¹ The classic cytogenetic abnormality associated with Ewing's sarcoma as well as with other PNETs is the reciprocal translocation between chromosomes 11 and 22.¹ Identification of this chromosomal rearrangement is valuable in distinguishing Ewing's sarcoma from other small round cell tumors.³

Ewing's sarcoma tends to occur in the diaphyses of long bones as well as in the flat bones of the body, but any bone may be affected. The most common sites are the lower extremity (45%), pelvis (20%), upper extremity (13%), axial skeleton and ribs (13%), and face (2%).³

The presenting complaint is usually local bone pain, tenderness, and a palpable mass. As with this case, pain may also be accompanied by paresthesias. The duration of symptoms prior to a definitive diagnosis can be weeks to months, with a median interval of 3 to 9 months.² Often when adolescents present with bone pain, the symptoms are attributed to growth spurts or minor sports injuries, which can add to delay of a definitive diagnosis.²

No currently available blood, serum, or urine test can specifically identify Ewing's sarcoma. However, nonspecific signs of inflammation may be noted, such as elevated ESR, moderate anemia, or leukocytosis. An elevated lactate dehydrogenase level correlates with severity of the tumor.² On plain radiographs, the lesion appears radiolucent and lytic, classically causing layered periosteal calcifications, or so-called *onion skinning*.¹ When reviewing

radiographic films, the PA should focus not only on the area of concern but also look at the entire film. The tendency is to gravitate toward the injured area, but as this case demonstrates, unexpected pathologies may be found. In this case, the area of radiolucency in the ramus of the mandible was visible in the panoramic radiograph and, on closer review, can also be seen on the initial cervical spine film (see Figure 2). MRI best defines the extent of the lesion. As with other sarcomas, biopsy is the definitive diagnostic test. Although the diagnosis can be made by fine needle aspiration or by core needle biopsy, the best means of sampling is by open biopsy.² In addition to imaging the primary site of the lesion, chest radiography, CT of the chest, and bone scanning should be performed to evaluate for metastatic disease. Primary metastasis in lungs, bone, and bone marrow is detected in about 25% of patients.²

Treatment of Ewing's sarcoma is with multivalent chemotherapy, radiation, and surgical resection. Approximately two-thirds of patients survive disease-free. The prognosis is poor in patients with a large tumor size, pelvic lesions, or presence of metastatic disease and in those who have a poor response to chemotherapy.² Our patient underwent full surgical excision of his tumor and partial resection of the jaw bone followed by chemotherapy. Facial reconstruction using a vascularized fibula free flap was performed at the time of the initial surgery. Currently the patient is doing well and is disease-free. **JAAPA**

Julie Vajnar, PA-C, RT, department editor

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