Diagnostic imaging findings for mandibular metastasis from gastric adenocarcinoma

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A case of metastatic adenocarcinoma from gastric cancer to the mandibular canine region is reported. Computerized tomography (CT) scanning revealed a small round enhanced inhomogeneous mass, indicating an osteolytic lesion on radiographic classification. Although chemotherapy and radiation therapy was performed, the mass increased, and a subsequent CT scan showed further calcifications within the tumor, indicating progression from an osteolytic to a mixed lesion. **(Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009;107:e49-e53)**

One to three percent of all malignancies involve the oral cavity.[1]

Only 1% of these oral malignancies involve metastases from neoplasms found below the head and neck level.[2,3] Metastatic tumors to the oral region most frequently occur in the soft tissues or mandible.[4]

The most common primary sources of metastatic tumors to the oral region are the breast, lung, kidney, bone, and colon. The breast is the most common primary site for tumors metastasizing to the mandible, whereas the lung is the most common source for metastases to the oral soft tissues. In the mandible, metastatic lesions are reported most frequently in the molar areas.[4] Few reports have been made of metastatic tumors in the mandible that have arisen from gastric cancer.

Because most patients who suffer a metastatic tumor in the oral cavity have also developed metastases at other sites, a palliative regimen is the usual management option. Local treatment of mandibular metastases most frequently involves radiation therapy to alleviate pain and reduce loss of function. Metastases to the oral soft tissues might more readily be approached surgically, with similar palliative results.[5] In the case reported here, chemotherapy was followed by radiation therapy.

Metastatic adenocarcinoma of the temporomandibular joint from the stomach has been reported, but the images of the mass before and after treatment were not described.[6]

The present study describes the development of metastatic adenocarcinoma from gastric cancer to the mandibular canine region and discusses the computerized tomography (CT) imaging findings both before and after treatment.

CASE REPORT

A 73-year-old woman had undergone surgery for gastric cancer in March 2003. Of the 2 masses found, one was a moderately well differentiated tuberous adenocarcinoma (Fig. 1) and was classified as Borrman type III on gross appearance. The other mass was a well differentiated tuberous adenocarcinoma (Fig. 1) and was classified as an early type IIa on gross appearance. Multiple liver metastases were detected.

In December 2003, the patient consulted a dental clinic with the chief complaint of painless swelling around the canine of the left mandible, which she had noticed a few months earlier. Treatment provided involved incision and drug therapy (antibiotic), but her condition did not improve. Consequently, she was referred by the dentist to our hospital for further examination in January 2004.

Oral examination revealed a 21 × 18 × 20 mm mass around the mandibular canine on the left side. There was a granular appearance and elastic surface mucosa covering the mass, partially covered by epithelium. Physical examination determined paresthesia to be present in the area concerned. Computerized tomography scans were obtained before and after contrast medium injection. An axial CT image showed a nonhomogeneous enhanced 30 mm round mass in the left

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Received for publication Feb 20, 2009; returned for revision Mar 3, 2009; accepted for publication Mar 3, 2009.
1079-2104/$ - see front matter
© 2009 Published by Mosby, Inc.
doi:10.1016/j.tripleo.2009.03.004

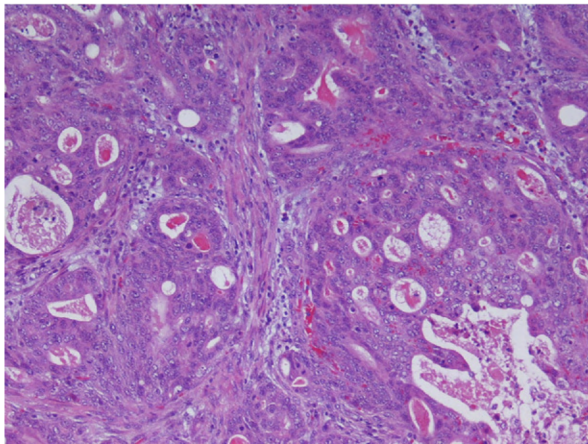

Fig. 1. Sections of primary lesions were identified as moderately well differentiated tuberous adenocarcinoma.

canine region (Fig. 2, *A*). There was bone resorption under the mass (Fig. 2, *B*). An axial magnetic resonance (MR) image indicated a poorly circumscribed mass measuring 30 mm in the left canine region (Fig. 3, *A-C*). The lesion showed a low signal intensity on T1-weighted image (Fig. 3, *A*) and moderate signal intensity on T2-weighted image (Fig. 3, *B*). With gadolinium–diethylene triamine pentaacetic acid injection, the lesion was slightly enhanced (Fig. 3, *C*). A sagittal MR image showed extension of the mass (Fig. 3, *D*). Based on these images, the lesion was diagnosed as a malignant tumor.

An incision was made and a biopsy taken. Under microscopic examination, the tumor was found to consist predominantly of well formed atypical glandular structures. The tumor cells showed many mitotic figures and nuclear atypia (Fig. 4, *A*). Surgical specimens of the gastric tumor showed the same histopathologic features as the gingival specimen. Furthermore, these showed vascular invasion and metastasis to the lymph node (Fig. 4, *B* and *C*). Based on these findings, the gingival tumor was diagnosed as metastatic adenocarcinoma from gastric carcinoma.

Although chemotherapy with cis-platinum, TS-1, and taxane was administered, the mass was not diminished. Radiation therapy was performed as a palliative to control the tumor. External beam irradiation was performed with 4-MV x-rays. A total dose of 56 Gy was given using standard fractionation at 2 Gy/fraction/5 d/wk. Unfortunately, the treatment was not effective and the mass increased further. An axial CT image showed more calcifications within the 50 × 45 mm mass in the left premolar region (Fig. 5). The patient died on October 21, 2004.

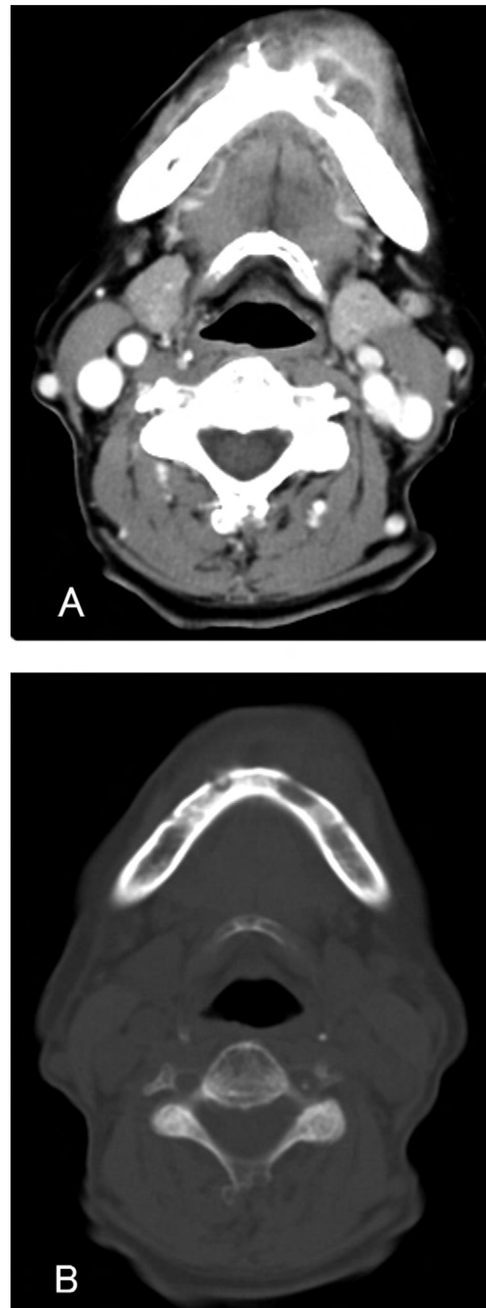

Fig. 2. **A,** Axial computerized tomography showed a nonhomogeneous enhanced round mass measuring 30 mm in the left premolar region at initial examination. **B,** There was bone resorption under the mass at initial examination.

DISCUSSION

As indicated previously, 1% of all oral malignancies are metastatic tumors.[2,3,7] The reported percentage may vary, but it generally remains low.[7] The frequency of the primary site differs between genders: For men, it is the lung (35.5%) followed by the kidney (16%) and skin (15%); for women, it is the breast (24%) followed by the genital organs (17%).[8] The present case involved metastatic adenocarcinoma from gastric cancer.

In most cases, treatment is palliative.[7] When a malignancy metastasizes to the oral and perioral tissue, the

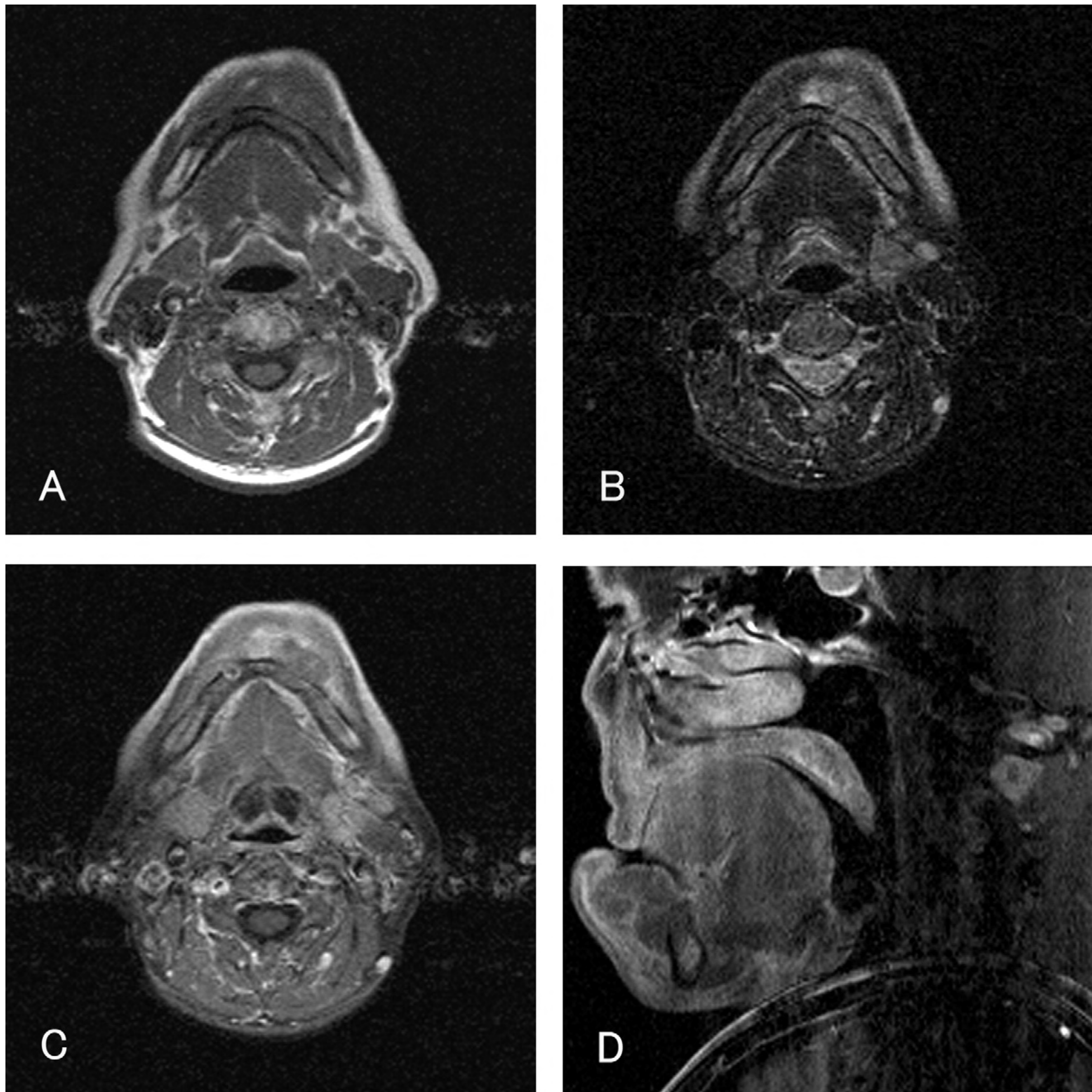

Fig. 3. **A,** The lesion showed low signal intensity on T1-weighted magnetic resonance (MR) imaging (400/9 TR/TE) at initial examination. **B,** The lesion showed moderate intensity on T2-weighted fat-saturated imaging (3,500/99 TR/TE) at initial examination. **C,** In axial T1-weighted enhanced fat-saturated imaging (500/9 TR/TE), the lesion showed slight enhancement at initial examination. **D,** Sagittal T1-weighted enhanced fat-saturated image (500/10 TR/TE) showed the extension of the mass at initial examination.

disease is usually advanced and the prognosis is therefore poor.[2] In the present case, the patient selected chemotherapy, but the lesion continued to grow and her pain increased. Therefore, radiation therapy was administered, but it was ineffective and the mass continued to grow.

Because severe bone resorption was noted in the gingival lesion at initial examination, it was not possible to determine whether the gingival mucosa was the initial recipient site of metastasis or whether the gingiva was secondarily involved by extension from metastatic bone in the jaw. The fundamental radiographic findings of bone metastases included in bone architecture are characterized as osteolytic, osteoblastic, or mixed.[9] Although most metastatic lesions are osteolytic, those associated with the prostate gland or the lung and breast as primary sites very often appear to be osteoblastic.[2]

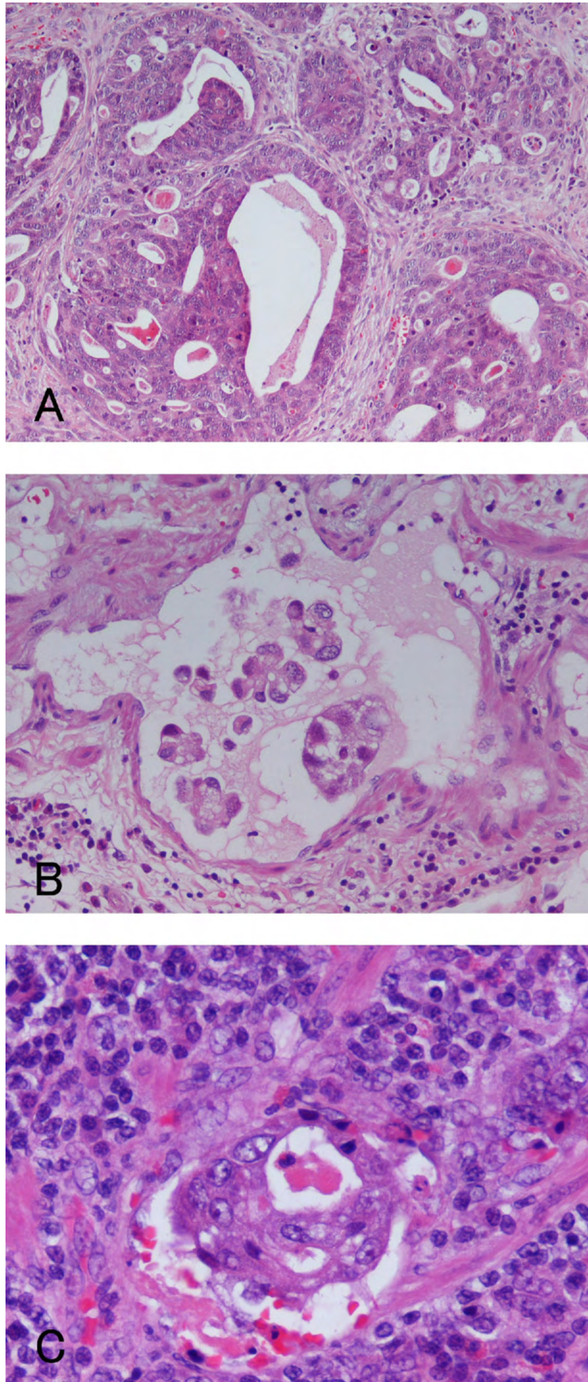

Fig. 4. **A,** The tumor cells showed numerous mitotic figures and nuclear atypia. **B, C,** Vascular invasion and metastasis to the lymph node were apparent.

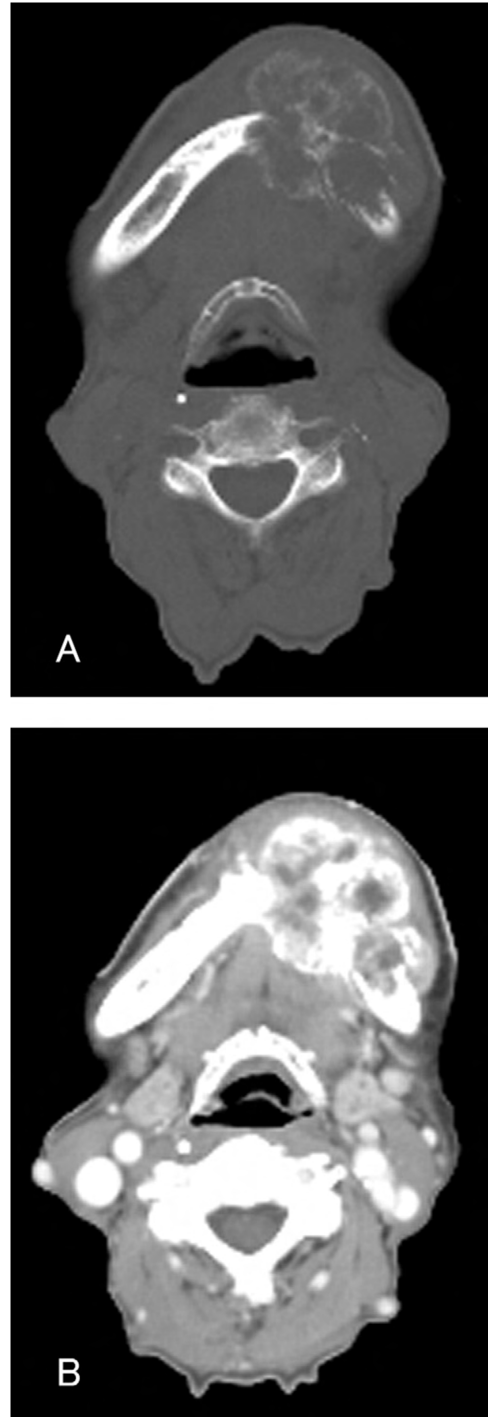

Fig. 5. **A, B,** Axial computerized tomography showed a 50 × 45 mm round mass in the left side of the mandible and there was calcification within the mass after chemotherapy and radiotherapy.

Metastatic lesions from the gastrointestinal tract and breast are often the mixed type.[10,11] If radiation therapy and chemotherapy are effective for bone metastasis, the growth of the mass may discontinue or decrease. The CT scan will demonstrate that there may be a new bone formation or some calcifications within the tumor and a change from the osteolytic type to the mixed on radiographic classification.[5]

In the present case, CT imaging at the initial examination showed bone resorption around the mass, and the radiographic pattern appeared to be osteolytic. After chemotherapy and radiation therapy, a CT scan showed that the mass had increased further and there were more calcifications within the larger mass. Neither chemotherapy nor radiation therapy was effective for the metastatic tumor, and some further calcifications formed within the tumor, inducing a change from the osteolytic type to the mixed on radiographic classification.

CONCLUSION

This study reported a case in which a gastric cancer spread to the mandibular canine region. Although chemotherapy and radiation therapy treatments were palliative, neither was effective. A CT scan showed some additional calcifications within the larger tumor, indicating a change from the osteolytic type to the mixed type on radiographic classification.

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