Metastasis in the Gingiva from Colon Adenocarcinoma

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Abstract A case of gingival metastatic tumor from a colon adenocarcinoma is reported. The patient had been diagnosed with colon carcinoma and underwent a colectomy with D2 dissection, followed by chemotherapy. Nine months after the initial treatment, she noticed a periodontal gingival swelling at the site of her right lower second premolar and was referred to our clinic. The clinical diagnosis was an epulis granulomatosa or pyogenic granuloma. A metastatic adenocarcinoma in the gingiva from colon carcinoma was identified after the histopathological examination. Although rare, oral metastatic tumors should be included in the differential diagnosis, particularly if the patient has a prior history of malignancies.

Keywords Gingiva · Metastasis · Colon adenocarcinoma

Introduction

Metastatic tumors in the oral cavity from the colon account for less than 1 % of all oral malignancies, making them an extremely rare occurrence [1–5]. The most often seen primary sites that metastasize to the oral region are the lung,

kidney, liver, prostate for men, and breast for women [2]. In light of its rarity, we report a case of metastatic neoplasm to the lower gingiva from a transverse colon carcinoma.

Case Report

A 65-year-old female presented with the complaint of abdomen distension. She underwent a lower gastrointestinal tract series and a colonic endoscopy with biopsy. She was diagnosed with a transverse colon adenocarcinoma. After a systemic examination was performed, including CT, MRI and ¹⁸F-fluorodeoxy glucose positron emission tomography (FDG-PET), multiple lung metastases from the colon carcinoma were discovered.

The patient had undergone transverse colectomy with D2 dissection and then underwent chemotherapy with mFOLFOX6 (leucovorin calcium, fluorouracil and oxaliplatin) and bevacizumab. Nine months later, she noticed that her gingival swelling involving the second left lower premolar was increasing. She was aware that the gingival mass was increasing and that her right lower lip was experiencing paralysis, but there was no pain. She was referred to our clinic by her primary gastrointestinal surgeon, and it was initially thought that she had a periodontal infection or a benign neoplasm.

At our first examination of the patient, our clinical diagnosis was an epulis granulomatosa or pyogenic granuloma (Fig. 1). By panoramic x-ray examination, an osteolytic lesion was not seen at the site of the right lower second premolar (Fig. 2). However, her present illness could not be ignored, and thus a biopsy was performed in order to determine whether the mass was a metastatic cancer. A histopathological examination showed that the nest of tumor cells was not connected to the mucosal surface. The tumor cells showed

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Fig. 1 A 24 mm × 20 mm mass seen at the buccal gingiva of the right lower second premolar. The mass was partially pedunculated and moderately firm. The surface of the mass was reddish pink, slightly erosive but ulcerated. The second premolar was moderately loose. (Color figure online)

Fig. 2 Panoramic x-ray showing a small periapical lesion at the right second premolar

invasive tubular proliferation and consisted of atypical glands lined by columnar neoplastic cells (Fig. 3a, b). The characteristics of tumor cells in the gingival lesion closely resembled the primary colonic carcinoma, because of their shared origin.

An additional immunohistochemical examination was done (Fig. 3c, d), and the tumor cells were positive for carcinoembryonic antigen (CEA), cytokeratin (CK)20, and caudal-type homeobox transcription factor 2 (CDX2) and negative for cytokeratin (CK)7. A final histological diagnosis confirmed the metastatic cancer of the colon adenocarcinoma. The mass of this metastatic lesion in the patient's mouth gradually increased, and a masticatory disturbance developed. The patient asked us to reduce the volume of the mass, and we performed a palliative resection under local anesthesia to reduce the tumor's volume. The patient regularly undergoes chemotherapy and palliative radiation therapy on an outpatient basis.

Discussion

Metastatic oral malignant tumors are extremely rare; in the range of 1–2.1 % of all oral malignancies [1, 3, 4]. Hirshberg et al. [2] reviewed the 673 cases of metastatic tumors of the oral cavity reported since 1916. They found that metastatic oral cancers from the colon-rectum accounted for 5.9 % (40/673), and 70 % of the metastatic tumors from the colon-rectum were metastases in the jawbone. The other 30 % were in the oral soft tissues, mostly in the gingiva [1, 2]. In our patient, the tumor involved only the periodontal attached gingiva of the right lower second premolar, and bone invasion into the mandible was not seen at the first examination. The mechanism of metastases to the oral soft tissues is not known, but hematogenous metastasis from a distant site was suggested in the present case. Regarding gingival metastasis from malignancies at a distant site, it has been reported that the tumor cells from primary sites tend to metastasize to the sites presenting the inflammation [1]. This seems to be the reason that the gingiva is the most frequent site for metastases in oral soft tissues from not only colonic cancer but also other malignancies. In most people, a certain degree of gingival inflammation exists due to chronic periodontitis. The capillary vessels in gingiva may have chronic inflammation, and the gingiva constantly proliferate and eventually develop fragmented basement membranes in the immature capillaries. These vessels continue to become more leaky at the basement membrane level and more accessible to penetration by tumor cells into the gingival matrix [1, 6]. An earlier analysis of the literature revealed 56 cases of metastatic oral malignancies in which tooth extraction was performed prior to the discovery of the metastases [7]; thus, the metastatic oral tumor may have been present at the site before the tooth extraction, and it means that the present of periodontal inflammation could induce metastasis of cancer.

Immunohistochemical staining is a useful technique to confirm a primary or metastatic origin. Colorectal adenocarcinomas usually express CK20, CDX2, and CEA but not CK 7 [8, 9]. In the present case, the histopathological features revealed by ordinary hematoxylin-eosin (HE) staining showed that the proliferation pattern and the shape of the tumor cells in the primary site of the transverse colon were closely matched by those in the gingival lesion. Of course, the differential diagnosis includes adenocarcinomas that originate from the oral minor salivary glands; however, it is not difficult to obtain a final diagnosis according to the above findings.

Prognosis after the discovery of oral metastasis was reported to be extremely poor [1–3, 5, 10]. In most cases, the metastatic oral lesions grew rapidly and caused acute discomfort, such as pain, bleeding and masticatory disturbances. The average survival time was less than 1 year, and

Fig. 3 **a, b** Histomorphological findings by HE staining $\times 10$
a Primary site of the transverse colon obtained by colectomy.
b Metastatic site in the gingival region. Based on the proliferation pattern and shape of the tumor cells, the origin of both tumors is thought to be approximately the same. **c, d** Immunohistological examination from the gingival tumor. CK20 (**c**) in the cytoplasm and CDX2 (**d**) in the nuclei are clearly positive in the tumor cells

it is therefore important to improve the patient's quality of life by treatment including palliative chemotherapy and radiation therapy [1, 2].

Conclusion

Although rare, metastatic tumors should be included in the differential diagnosis even in the oral region, particularly if the patient has a prior history of malignancies.

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