The surgical management of a leiomyosarcoma of the submandibular gland in a 95-year-old patient

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Primary sarcomas of the major salivary glands are rare and appear to originate from undifferentiated pluripotential mesenchymal cells. They must be distinguished from malignant supporting tissue neoplasms that secondarily involve the glands by direct extension or metastasis. Multidisciplinary management of head and neck soft tissue sarcomas is still controversial. We report a case of leiomyosarcoma of the submandibular gland in a 95-year-old man who was treated with excision of the right submandibular gland, extended to the surrounding tissues, without neck dissection. The patient tolerated the treatment well. Twenty-four months after surgery, the patient was doing well without any evidence of locoregional or distant disease. Surgery is the cornerstone of the management of leiomyosarcomas of the salivary glands. Wide surgical excision with histologically proven tumor-free margins was an appropriate treatment that may guarantee prolonged survival. (Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;112:e34-e38)

Leiomyosarcoma (LMS) is a relatively rare mesenchymal tumor that represents 5%-7% of all soft tissue sarcomas.1,2 They usually occur in the uterus, gastrointestinal tract, and retroperitoneum, whereas only 3%-10% of all LMSs arise in head and neck.1,3,4 Primary sarcomas rarely arise in major salivary glands.5 These tumors appear to originate from undifferentiated pluripotential mesenchymal cells and must be distinguished from malignant supporting tissue neoplasms that secondarily involve the glands by direct extension or metastasis.5 Similar to their soft tissue counterparts, prognosis is based on the size, location, histologic grade, and complete resection of the tumor.6 Surgery is the primary therapeutic approach for the management of head and neck sarcomas in all ages with some exceptions in the pediatric population.7

In this article, we present and discuss the management of a case of a primary LMS of the submandibular gland in a 95-year-old patient.

CASE REPORT

A 95-year-old white man was referred to the Division of the Maxillofacial Surgery, San Giovanni Battista Hospital, University of Turin, Turin, Italy, for evaluation of a right submandibular swelling that had appeared 6 months before.

Clinical history revealed the presence of hypertension, an acute myocardial infarction that occurred 5 years before, and the presence of an atrioventricular block treated by pacemaker implantation.

Clinical examination revealed a right submandibular, firm, painless mass that was nontender to palpation (Fig. 1). There was no cervical lymphadenopathy.

Ultrasonography showed an expansile, solid, hypoechoic, heterogeneous mass measuring ~4 × 3 cm. It appeared to involve the right submandibular gland. No pathologic lymph nodes were found (Fig. 2).

A contrast-enhanced computerized tomography (CT) scan confirmed the presence of a heterogeneous lesion measuring about 4 × 3 cm involving the right submandibular gland. Enhancement of the mass was slow but progressive. No pathologic lymph nodes were diagnosed (Fig. 3). An ultrasound-guided fine needle aspiration biopsy was performed, which allowed to recognize fascicles of spindle-shaped cells, suggestive for a sarcomatous lesion. The distant metastasis workup (including positron-emission tomography–CT) was negative.

A resection of the right submandibular gland, extended to the surrounding tissues, was performed via submandibular approach under general anesthesia.

Microscopically, the tumor consisted of intersecting bundles and fascicles of spindle cells with ample amount of eosinophilic cytoplasm (Fig. 4). Elongated nuclei with dispersed chromatin and occasional small nucleoli were found. Mitosis averaged 5 per 10 high-power fields, and the stroma was characterized by necrotic foci. Immunohistochemistry demonstrated positive staining of the tumor cells for desmin and smooth muscle actin (SMA; Fig. 5) and negative staining for S-100 protein antigen and CD34.

Therefore, a final diagnosis of low-grade leiomyosarcoma of the submandibular gland was established. The tumor was
rated as grade I according to the Federation Nationale des Centres de Lutte Contre le Cancer (FNCLCC) classification.\textsuperscript{8}

The patient is currently followed; 24 months after surgery, the patient was doing well without any evidence of locoregional or distant disease.

\textbf{DISCUSSION}

LMS is a malignant mesenchimal tumor that is considered to be one of the most uncommon types of soft tissue sarcoma in the head and neck.\textsuperscript{7}

This article was exempted from review by our Institutional Review Board human studies committee; we followed the guidelines of the Helsinki Declaration.
LMS usually occurs in soft tissue of the extremities and trunk; only 3% of LMSs are in the head and neck. Furthermore, when dealing with an LMS in the salivary glands, the possibility of a metastasis has to be considered, because primary sarcomas of the salivary glands, including LMSs, are extremely rare, accounting for 0.3%-1.5% of all salivary gland tumors. Sarcomas in the head and neck region, and in particular of salivary glands, usually have nonspecific symptoms, with a painless and progressive mass being the most significant finding, as in the present patient. Pain is sometimes referred.

The following diagnostic criteria for primary salivary gland sarcomas have been suggested: 1) The patient must not have, or have had, a sarcoma elsewhere; 2) a metastasis to the gland from malignancies of the skin or mucosa of the upper aerodigestive tract must be excluded; 3) the gross and microscopic appearances should be consistent with a primary origin, rather than invasion from the adjacent soft tissues; and 4) within the limits of the microscopic study of multiple sections, carcinosarcoma has to be excluded.

Therefore, clinical information, a thorough physical examination, and imaging studies are extremely important to ensure a correct diagnosis, although a final diagnosis is mainly based on histopathologic and immunohistochemical studies.

Radiologic investigations are frequently nonspecific for diagnosis. However, ultrasonography, CT and/or magnetic resonance imaging facilitates evaluation of the extent of the primary lesion and assessment the regional lymph nodes.

Histologically, to make a correct diagnosis, it is important to assess the microscopic as well as the immunohistochemical features of the lesion. LMSs show typical histologic and architectural features: they are composed by bundles and fascicles of spindle-shaped cells with elongated, “cigar-shaped” nuclei and abundant eosinophic cytoplasm. The presence of necrotic foci and the high number of mitotic figures per HPF are important features of malignancy. Tumors that exhibit 1 mitotic figure per 5 high-power fields are considered to be malignant.

Immunohistochemistry plays an important role in the correct diagnosis and in the assessment of sarcomatoid lesions of the salivary glands, especially in excluding metastatic spindle carcinomas and melanoma.

The neoplastic spindle cells of LMS present a positive reaction with antibodies targeted against smooth muscle antigenic epitopes of mesenchymal origin, such as SMA, muscle-specific actin (MSA), and vimentin. Instead, a negative reaction is expected with the use of antibodies targeted against epithelial antigenic epitopes (such as cytokeratins and epithelial membrane antigen), against S-100 protein (melanoma and neurogenic sar-
and neck is primarily surgical. Wide and complete metastases. Using radioactive isotopes to rule out possible bone and lower abdomen ultrasound; and a skeletal survey or a chest CT; upper and lower abdomen CT or upper possible metastasis to regional lymph nodes; chest films location and extent of the lesion and to investigate for should include: a head and neck CT to outline the patient with a suspected LMS of the head and neck sarcoma, solitary fibrous tumor, malignant peripheral nerve sheath tumors, spindle cell rhabdomyosarcoma, spindle cell liposarcoma, spindle cell carcinoma, malignant melanoma, angiosarcoma, and malignant fibrous histiocytoma. Therefore, the diagnosis should be supported by immunohistochemistry and eventually electron microscopy.

As Vilos et al. wrote, the complete workup of a patient with a suspected LMS of the head and neck should include: a head and neck CT to outline the location and extent of the lesion and to investigate for possible metastasis to regional lymph nodes; chest films or a chest CT; upper and lower abdomen CT or upper and lower abdomen ultrasound; and a skeletal survey using radioactive isotopes to rule out possible bone metastases.

The management of soft tissue sarcomas in the head and neck is primarily surgical. Wide and complete surgical excision is the mainstay of treatment, being associated with low local recurrence and longer survival. In fact, it is evident that resection on microscopically tumor-free margins is of paramount importance for long-term survival. However, it is rare for sarcomas to spread through the lymphatics, especially in the head and neck, which emphasizes that neck dissection should be reserved for patients with lymph node metastasis. Indeed, in our case, a wide and complete local excision with negative surgical margins was performed, without neck dissection.

Some authors recommend adjuvant radiotherapy for high-grade sarcomas, large tumors, and close or positive surgical margins. However, the role of adjuvant chemotherapy in treatment of adult head and neck soft tissue sarcoma still remains controversial.

LMSs manifest an indolent course but late recurrences or metastases have been reported, thus a prolonged or indefinite follow-up of these patients should be kept. In fact, recurrence rate is between 40% and 60%.

The metastatic potential for leiomyosarcomas is low. This neoplasm typically metastasizes hematogenously, and lymph node metastases are extremely rare. The most frequently involved site of distant metastases is lung followed by bone, central nervous system and liver.

Little is known about the overall biologic behavior of LMS, because of the extremely low incidence of such tumors in salivary glands. The prognosis seems to related to the grade and size of tumor, location of lesion, and type of treatment modality used. Grade is the most important prognostic factor for overall survival of patients with soft tissue sarcoma, whatever the primary location. The FNCLCC grading is a 3-scale system, including evaluation of necrosis, differentiation, and mitosis rate. As for size, lesions <3 cm present a better prognosis.

Location of the LMS also seems to be an important prognostic factor because peripheral leiomyosarcomas behave in a much more favorable fashion than tumors located in deep tissues. Finally, the quality of surgery (number of procedures required and clear margins) has also been recognized to be crucial. Twenty-four months after surgery, the present patient was doing well without any evidence of locoregional or distant disease.

In conclusion, surgery is the cornerstone of the management of LMSs of the salivary glands. Therefore, wide surgical excision with histologically proven tumor-free margins appears to be the most appropriate treatment that may guarantee prolonged survival.

REFERENCES

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