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Primary parapharyngeal leiomyosarcoma: A case report

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Abstract

Leiomyosarcoma is a rare malignant soft-tissue tumor whose cells resemble smooth-muscle tissue. It has been reported to arise in different areas of the head and neck region. Primary leiomyosarcoma of the parapharyngeal space, however, is extremely rare, as only 4 cases have been previously reported to date. We describe the somewhat urgent case of a primary leiomyosarcoma of the right parapharyngeal space in a 30-year-old man. We also review the diagnostic and therapeutic challenges that clinicians face in managing this rare tumor.

Introduction

Leiomyosarcoma is a malignant mesenchymal tumor whose cells resemble smooth-muscle tissue.[1] Very little is known about its etiopathogenesis, although there is some scant evidence that the Epstein-Barr virus (EBV) might be a causal factor in immunocompromised patients.[1] Head and neck leiomyosarcoma is very rare, although in some series it represents the second most common type of sarcoma in this region.[1,2] To the best of our knowledge, only 4 cases of parapharyngeal leiomyosarcoma have been previously reported in the literature.[3-6]

In this article, we report a new case of leiomyosarcoma of the parapharyngeal space in a young adult. We also discuss the clinical and pathologic features and the therapeutic approach in this case.

Case report

A 30-year-old man presented to the first-aid unit of our ENT clinic complaining of worsening dyspnea, dysphagia, and the presence of a right-sided parotid gland swelling that he had first noticed 4 years earlier. During the first 3 years, the lesion had grown slowly, but in the fourth year it had begun to grow more rapidly. He had not previously sought medical advice.

Clinical examination revealed the presence of a solid, painless swelling in the right parotid space without overlying skin changes. The right tonsillar lodge and the rhino- and oropharynx on the same side were pushed medially. No lesions were apparent in the pharyngeal mucosa. Findings on neck palpation and a full neurologic examination were unremarkable. No fever was recorded.

Urgent computed tomography (CT) of the head and neck identified a 6.5 × 7.0 × 4.5-cm solid mass in the right parapharyngeal space (figure 1). The lesion extended from the deep parotid space cranially to the area of the clivus, and it filled the anterior prevertebral space with erosion of the pterygoid processes and the right maxillary bone. Anteriorly and cranially, the tumor extended to the floor of the orbit. There were no signs of infiltration of the ascending ramus of the mandible. The right parotid gland was compressed and laterally displaced by the mass. Fine-needle aspiration cytology was performed transorally. It showed a few clusters of epithelial cells without significant atypia.

Given the patient's increasing respiratory distress, he was scheduled to undergo primary surgery on day 2 of the admission. A nerve-sparing total parotidectomy via a transparotid-transcervical approach was undertaken, and the mass was fully excised and sent for frozen-section analysis. The pathologist identified the sample as a spindle-cell neoplasm with atypia, not suggestive of epithelial malignancy. All margins were deemed to be free of disease on intraoperative examination. Next, a superselective dissection of ipsilateral level IIa was performed; frozen-section analysis was negative for malignancy.

Macroscopically, the lesion appeared as a 7.5 × 6.0 × 3.2-cm white nodule of firm consistency surrounded by a fibrous capsule. On histopathologic examination, it was composed of elongated spindle-shaped cells arranged in interlacing bundles and fascicles that had infiltrated the stromal tissues of the capsule (figure 2). At higher magnification, neoplastic cells exhibited abundant eo-

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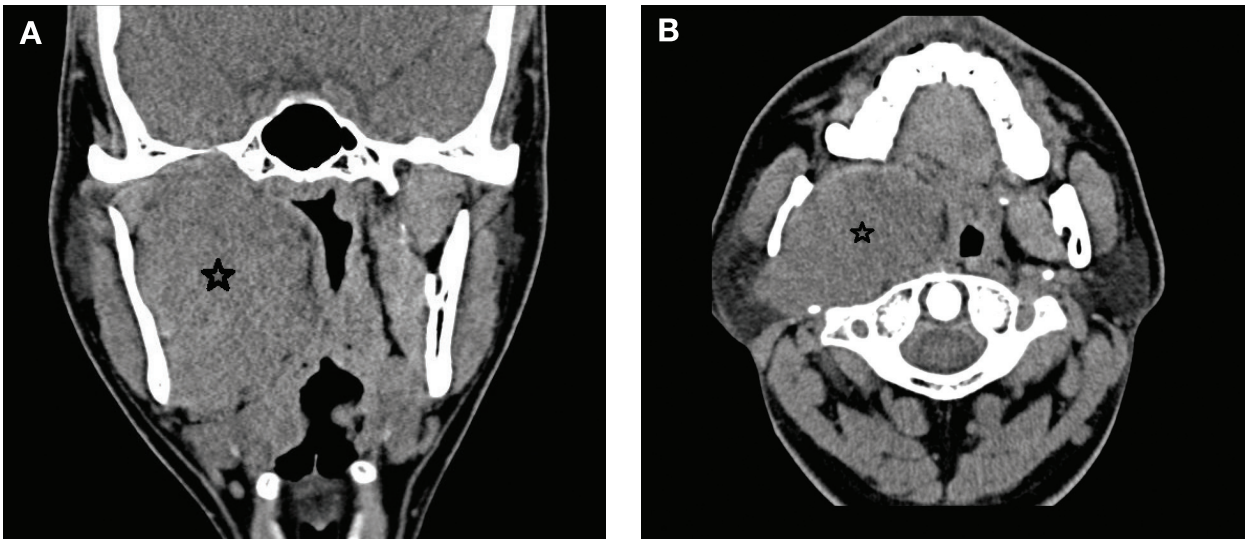

Figure 1. ***A****: Coronal CT shows the mass (star) occupying the right parapharyngeal space.* ***B****: Axial view shows the mass (star) obliterating the right parapharyngeal space and extending to the midline.*

sinophilic cytoplasm, cigar-shaped blunt-ended nuclei, nuclear pleomorphism, and prominent nucleoli. The mitotic rate was 1 to 2 mitoses/10 hpf.

Immunohistochemical staining was positive with anti-caldesmon, anti-alpha smooth-muscle actin (actin 1A4), and anti-common muscle actin (HHF-35) (figure 3). There was focal positive staining with epithelial membrane antigen. Desmin, myogenin, S-100 protein, and cytokeratins were all negative. The proliferative fraction (Ki-67) was 2 to 3%, and in situ hybridization for EBV was negative.

On the basis of the morphologic and immunohistochemical findings, a final diagnosis of high-grade leiomyosarcoma was made. Surgical margins, nine regional lymph nodes, and salivary gland tissue were all free of disease. According to the TNM system (VIIth edition),[7] the tumor was classified pT2bN0G3, stage III.

The patient underwent chemoradiation as adjuvant therapy; doxorubicin and dacarbazine were administered, and external radiation was given to a total dose of 70 Gy.

The patient's postoperative period was uneventful, and he experienced a full recovery. At 7 years of follow-up, he was free of disease clinically and radiologically. He experienced a full recovery in all branches of the facial nerve and was classified as House-Brackmann grade I.

Discussion

Parapharyngeal tumors account for less than 0.5% of all head and neck neoplasms, and they are benign in 80 to 85% of cases.[8] Most of them are salivary gland

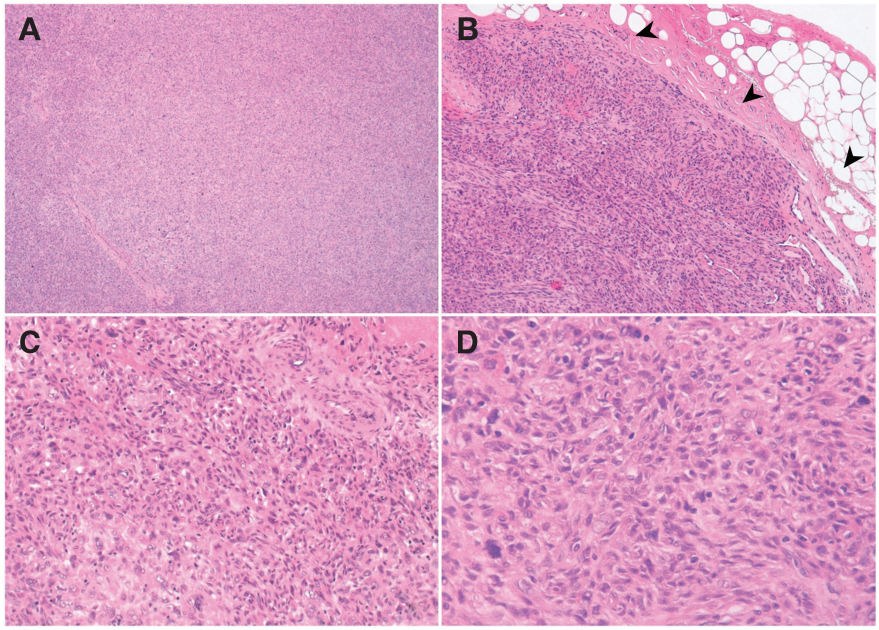

Figure 2. Histopathology shows typical mesenchymal spindle cells arranged in fascicles and bundles with a high grade of pleomorphism. Infiltration of the capsule (arrowheads) is also seen (H and E, original magnification ×40, ×100, ×200, and ×400 from ***A*** *to* ***D****, respectively).*

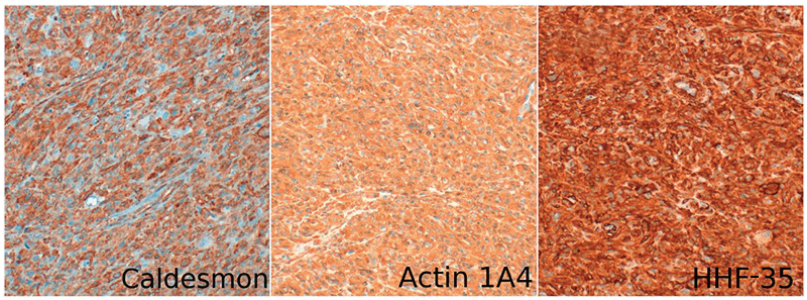

Figure 3. Immunohistochemistry shows strong positivity for caldesmon, actin 1A4, and HHF-35 (original magnification ×200).

tumors; pleomorphic adenomas, paragangliomas, and schwannomas account for nearly 60% of all parapharyngeal tumors. Muscle tumors in this anatomic space are rare, and only a few case reports of rhabdomyomas and rhabdomyosarcomas can be found in literature.[9] Leiomyosarcomas of the parapharyngeal spaces are exceedingly rare and, to the best of our knowledge, only 4 cases have been previously described in the literature.[3-6]

While the arrector pili muscle is believed to be the most probable source of cutaneous leiomyosarcoma, some authors have suggested that the tunica media of the blood vessels is the source of deep primary leiomyosarcoma.[3]

Compared with the uterine and gastrointestinal variants, deep head and neck leiomyosarcomas are more aggressive and associated with a poorer prognosis. On the other hand, cutaneous leiomyosarcomas are associated with a 5-year disease-specific survival of 96%.[10]

In all 4 cases of parapharyngeal leiomyosarcomas previously reported in the literature and in our case, patients complained of throat discomfort and exhibited bulging of the lateral pharyngeal wall, which are classic presenting features of parapharyngeal tumors.[3-6] Magnetic resonance imaging is the preferred modality for the evaluation of a parapharyngeal tumor.[11] Moreover, when a sarcoma is suspected, some authors recommend chest and abdominal CT because of the risk of hematogenous metastasis.[1] When available, a CT-guided percutaneous needle aspiration should be performed; this is a safe and accurate procedure.[11]

In our case, histopathologic evaluation revealed that the morphologic features were strongly suggestive of leiomyosarcoma, and smooth-muscle differentiation was further demonstrated by immunohistochemistry, which showed positivity with caldesmon, actin 1A4, and HHF-35.[1]

Locketz and coworkers argued that the nature of a patient's symptoms dictates whether surgery is indicated.[8] They believe that a watch-and-wait strategy should be adopted only for patients with asymptomatic parapharyngeal tumors that exhibit no suspicious imaging features.

A complete surgical excision with wide negative margins remains the mainstay of treatment for leiomyosarcoma.[1] A review of head and neck leiomyosarcoma cases by Eppsteiner et al found that patients who underwent surgery had better survival rates than did those who received primary radiotherapy.[10] The classic surgical approaches to the parapharyngeal space are via the transoral, transcervical, transparotid, or transmandibular route. Newer treatment strategies were recently introduced, including an endoscopic transnasal-transmaxillary-transpterygoid approach.[12]

Achieving safe surgical margins is of paramount importance with respect to overall survival. It has been shown in soft-tissue sarcomas of the limbs that positive surgical margins are an independent negative prognostic factor for locoregional failure; other risk factors are large tumor size, high grade, deep location, and recurrent disease at presentation.[13] A margin of at least 2 cm seems to be required, although this is still debated.[14] However, obtaining microscopically free margins is often difficult in the head and neck region without affecting critical functions.

Neoadjuvant chemotherapy has been recommended by some authors, but its impact on overall survival is unclear.[14,15] Adjuvant postoperative radiotherapy, particularly for high-grade tumors, can effectively improve survival, although its role appears to be quite limited.[14] In a recent study, Mahmoud et al found that 5-year overall survival in patients who received adjuvant radiotherapy (49%; 95% CI: 38 to 50) was superior to that of those who were treated with surgery alone (44%; 95% CI: 43 to 55).[15] In our case, a radiotherapy cycle was indicated because we could not achieve wide surgical margins due to the tumor's proximity to vascular and neural structures, and also due to the tumor's high grade. Given the scarcity of published studies on this topic, the role of chemotherapy in the adjuvant setting remains to be elucidated.[14,15]

Proper follow-up of patients with a parapharyngeal tumor is strongly reliant on accurate physical examinations and imaging. Clinical examinations must be performed regularly. Close monitoring of the surgical site and chest can be achieved with periodic CT. National Comprehensive Cancer Network guidelines suggest a radiologic assessment every 3 to 6 months for 2 or 3 years after treatment, then every 6 months for the next 2 years, and eventually once yearly thereafter.[7]

In conclusion, leiomyosarcoma is rarely seen in the head and neck region, particularly in the parapharyngeal spaces. Its treatment does not differ from that of other soft-tissue sarcomas: wide surgical excision. Depending on tumor size, location, grade, stage, and the status of surgical margins, adjuvant therapy also may be administered. Generally, however, survival rates are not satisfying and the prognosis often dismal despite close clinical and radiologic follow-up.

Future research in molecular biology on this particular type of cancer might lead to better, more patient-tailored approaches to treatment.[1]

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