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CASE REPORT

Malignant peripheral nerve sheath tumor of the parotid gland

Parotis bezinin habis periferik sinir kılıfı tümörü

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Malignant peripheral nerve sheath tumors originating from the parotid gland are extremely rare. A 76-year-old male patient underwent an incisional biopsy for an ulcerated mass in the anteroinferior aspect of the left auricle. The diagnosis was made as malignant mesenchymal tissue sarcoma, but the patient refused treatment. Upon progressive growth of the mass within two months, he underwent a partial parotid gland resection. After three months, he was referred to our clinic with an aggressively growing parotid mass. Total parotidectomy and radical neck dissection were performed. Histopathological diagnosis was malignant peripheral nerve sheath tumor. Following radiotherapy, has been under follow-up for five years.

Key Words: Head and neck neoplasms; nerve sheath tumors/pathology/surgery; parotid neoplasms.

Parotis bezinden habis periferik sinir kılıfı tümörü gelişimi son derece nadirdir. Yetmiş altı yaşında erkek hastaya, sol kulak ön-alt bölümünde ülseratif kitle nedeniyle daha önce yapılan biyopsi sonucunda malign mezenkimal tümör tanısı konmuş, ancak hasta tedaviyi reddetmişti. Sonraki iki ay içinde kitlenin büyümesi nedeniyle parsiyel parotis rezeksiyonu yapılmıştı. Hasta üç ay sonra parotiste aşırı büyüme nedeniyle kliniğimize başvurdu. Hastaya tedavi olarak total parotidektomi ve radikal boyun diseksiyonu uygulandı. Histopatolojik tanı malign periferik sinir kılıfı tümörü olarak kondu. Radyoterapi uygulanan hasta beş yıldır takip edilmektedir.

Anahtar Sözcükler: Baş-boyun neoplazileri; sinir kılıfı tümörü/patoloji/cerrahi; parotis neoplazileri.

Malignant peripheral nerve sheath tumors (MPNST) are among the rare tumors of the head and neck region. They comprise about 10% of all soft tissue sarcomas of the human body.[1] Although benign neurofibromas and schwannomas are rather common, their malignant counterparts rarely exist in head and neck region.[2] Benign schwannomas originating from the parotid gland are seldom presented as "case reports" in medical literature[3] and their malignant variant is even more rare.[4] While neurofibromas, von Recklinghausen disease and previous radiation therapy are proposed as predisposing factors for MPNST's, the exact cause is still unknown.[2]

The histological properties of MPNST's constitute their most debatable aspect. The histological diagnosis of MPNST's as malignant mesenchymal tumors is easy; however the differentiation of

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MPNST's from other mesenchymal sarcomas (fibrosarcoma, synovial sarcoma, leiomyosarcoma) is rather difficult and may necessitate the use of sophisticated diagnostic modalities such as electron microscopy for the differential diagnosis.[1] Like other soft tissue sarcomas, MPNST's are also well-known for their local aggressive behavior and hematogenous dissemination rather than lymphatic route.[1] For this reason, the accepted treatment modality is wide "en-bloc" resection with sufficient margins of safety.[5,6]

The diagnosis of the case presented in this report was obscure and was accepted histologically as malignant mesenchymal tissue sarcoma for a long time. The accurate diagnosis could only be reached after the 3rd operation. Lymphatic preference of dissemination rather than hematogenous route is one of the features that make the case distinctive.

CASE REPORT

A seventy-six year old male patient presented with complaints of an ulcerated mass located within the anteroinferior aspect of the left auricle and a vague sensation of pain. The onset of the complaints was about eight months before he was referred to our clinic. Initially, he was evaluated for a limited mass within the left parotid gland in a distinct institution, and the incisional biopsy performed had revealed "malignant mesenchymal tissue sarcoma" but the patient had refused the proposed treatment. Within two months, the mass enlarged rapidly and a limited partial parotid gland resection was performed in the same clinic. The histological diagnosis was again "malignant mesenchymal tissue sarcoma". After three months, the patient was referred to our clinic with an aggressively growing parotid mass with dermal exteriorization (Fig. 1). No limitation of the facial nerve function was evident at the time of presentation.

The systemic physical examination of the patient did not reveal anything peculiar, and the possible diagnosis of von Recklinghausen disease was excluded. Neither medical nor family history attributed to anything special. The patient had never smoked in his life and no weight loss was observed during the course of his current disease. Despite insistent inquiry, the patient did not mention any sensorial or functional deficit which could indicate the nerve of origin. An incisional biopsy was performed which revealed that the tumor was formed as bundles originating from spindled shaped cells (Fig. 2). In-between, myxoid and cell-free areas attracted attention. Scattered amounts of epitheloid like cells were present and abundant areas of pleomorphism, necrosis and mitosis existed. Under these circumstances, the histological diagnosis of MPNST was established.

The axial scan of the computed tomography (Fig. 3) revealed a 4x3.5 cm hypodense mass located within the deep portion of the left parotid gland. Heterogeneous opacification of the mass with ill-defined borders was observed after intravenous injection of the contrast agent; however no opacification was observed within the core of the mass indicating the necrotic component. It was clearly evident that the mass extended to the parapharyngeal space with effacement of the fatty planes, and the exact borders of the major vascular structures were not distinct.

Thereupon, an operation protocol consisting of total parotidectomy covering the invaded skin and ipsilateral radical neck dissection was performed due to the presence of palpable metastatic lymph node disease at 1st cervical level. During total parotidectomy, all branches of the 7th cranial nerve were dissected and determined to be intact and

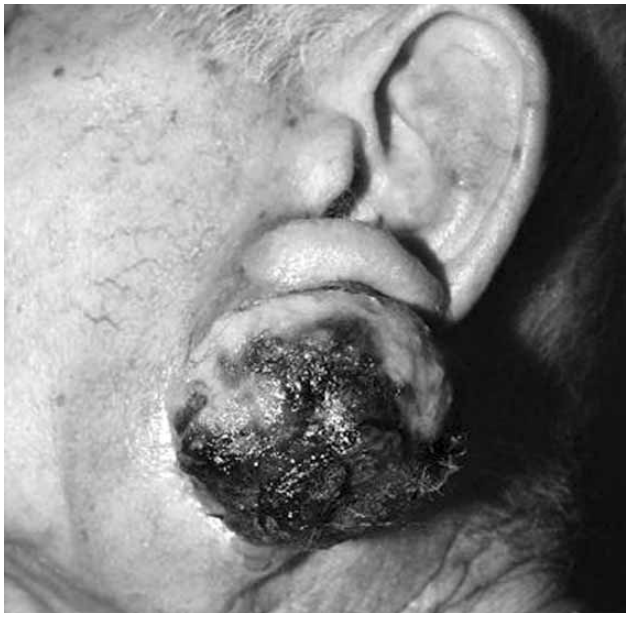

Fig. 1 - *Gross fleshy appearance of malignant peripheral nerve sheath tumor of the parotid gland located within the inferior pole of the gland with dermal exteriorization.*

uninvaded hence; the facial nerve appeared not to be the nerve of origin of the MPNST of the parotid gland. Macroscopically, the tumor was a bulky, fleshy and poorly defined, non-encapsulated lesion with soft consistency due to massive necrosis and cystic degeneration. The reconstruction of the defect was performed by virtue of the pectoralis major myocutaneous flap. The histological evaluation of the specimen revealed the diagnosis of MPNST and two out of nine lymph nodes dissected during the radical neck dissection were found to be invaded by metastatic disease showing the same histological pecularities with the parotid lesion (Fig. 4). The immunohistochemical evaluation of the specimen revealed that the epithelial antigens (cytokeratin, EMA) and desmin were negative but S-100 was focally positive. The surgical margins were found to be tumor-free on histological examination.

The unusual pattern of metastatic neck disease was accepted as a clear indication for external radiotherapy by the joint decision of the tumor board. 6500 Rads of external radiation was applied over six weeks following surgery. The patient was found to be tumor-free in the postoperative follow up, period of five years.

DISCUSSION

Although previous reports on MPNST's claim that there is no evidence of malignant degeneration of a benign peripheral nerve sheath tumor into a malignant sarcoma,[3,7] reports in current literature mostly agree upon a strong relationship between the benign neurofibromas and MPNSTs.[1,2,8]

Malignant peripheral nerve sheath tumors constitute one of the most difficult sarcomas to diagnose due to their cytological variability and architectural pattern.[1] They are often confused with other soft tissue sarcomas. In order to prevent this ambiguity, certain clinical and histological diagnostic criteria have been proposed. Although positive in 70-75% of the cases, S-100 protein is not specific[5,9] and it is also detected in some other tumors like benign peripheral nerve sheath tumors, melanomas and chondroid tumors. Another diagnostic criterion is the demonstration of the nerve of origin in the surgical specimen. However, as previously stated, the nerve of origin may not be identified in larger tumors.[1,9] The site of origin in our case is also obscure since the tumor is rather bulky and the patient had experienced two previous operations each ending with recurrence. Nevertheless, it can be stated that the nerve of origin in our case is probably not the facial nerve since all branches were found to be intact during total parotidectomy. The tumor possibly originated from the small cutaneous nerve endings of the great auricular nerve in the parotid region.

There is not as much uncertainty in the treatment of MPNST's as there is ambiguity in its histological

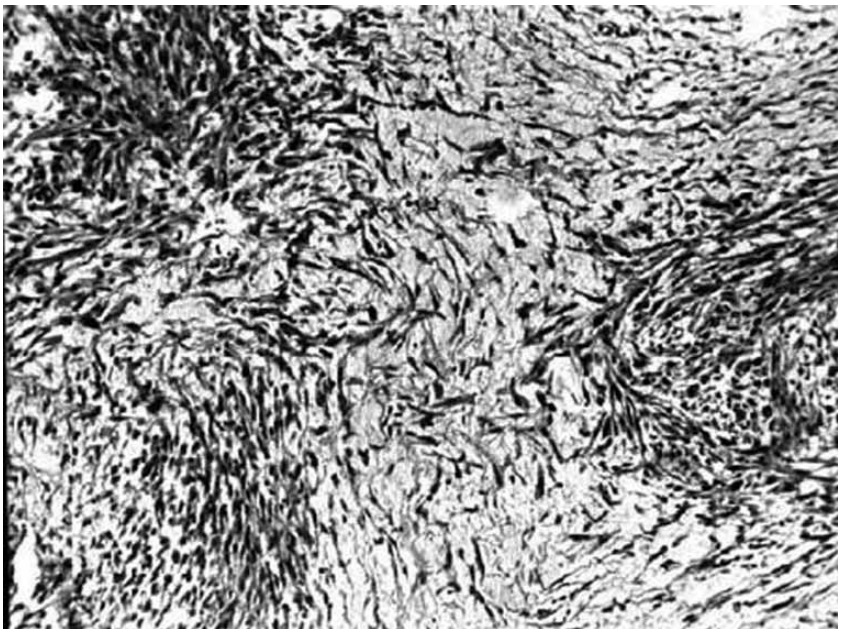

Fig. 2 - *Tumor infiltration consisting of spindle shaped cells, adjacent myxoid and cellular zone (H-E x magnification).*

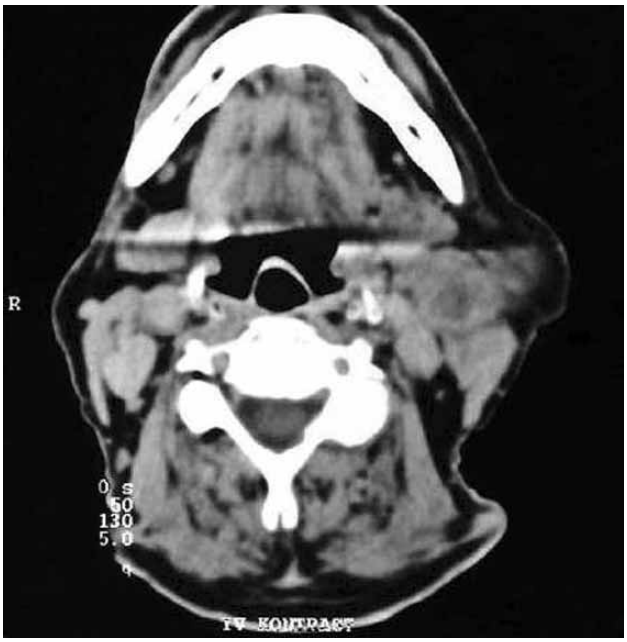

Fig. 3 - *Computed tomography image of the tumor in axial plane.*

diagnosis. The biological behavior of MPNST's of the salivary glands does not differ from that of other soft tissue sarcomas.[10] Both histological and clinical criteria may give clues as prognostic indicators. As stated by Weber et al.[11] high degree of pleomorphism, atypical mitosis, necrosis and infiltrative histological pattern are the histological criteria indicating aggressiveness of the tumor and hence grim prognosis. Additionally, size and lesion depth are the clinical criteria indicating worse prognosis. Nevertheless, the most significant prognostic criterion is the presence of tumor cells in the surgical margins. For this reason, the most widely accepted treatment modality for MPNST's is the wide, "en-bloc" radical resection of the lesion with a wide margin of safety of the uninvolved tissue.[1,6,10,11] Despite many grim prognostic indicators, our case presented the most important good prognostic criterion which is tumor-free margins. This is the main reason for the disease free survival of the patient for five years after the surgery.

Soft tissue sarcomas are known for their local aggressiveness and tendency to spread hematogenously rather than via lymphatic route.[9] In the series of Auclair et al.[9] which is one of the largest series in medicalliterature in English about sarcomas of major salivary glands, only three cases of lymphatic metastases could be detected out of 67 cases. However, in our case, metastasis to the 1st level of lymphatic cervical chain was observed. For this reason, in spite of the fact that the definitive efficiency of external radiotherapy in soft tissue sarcomas is debatable.[2,6] We were compelled to use postoperative radiotherapy as a part of the primary treatment protocol.

CONCLUSION

Malignant peripheral nerve sheath tumors are sarcomas that are difficult to diagnose due to their cyto-

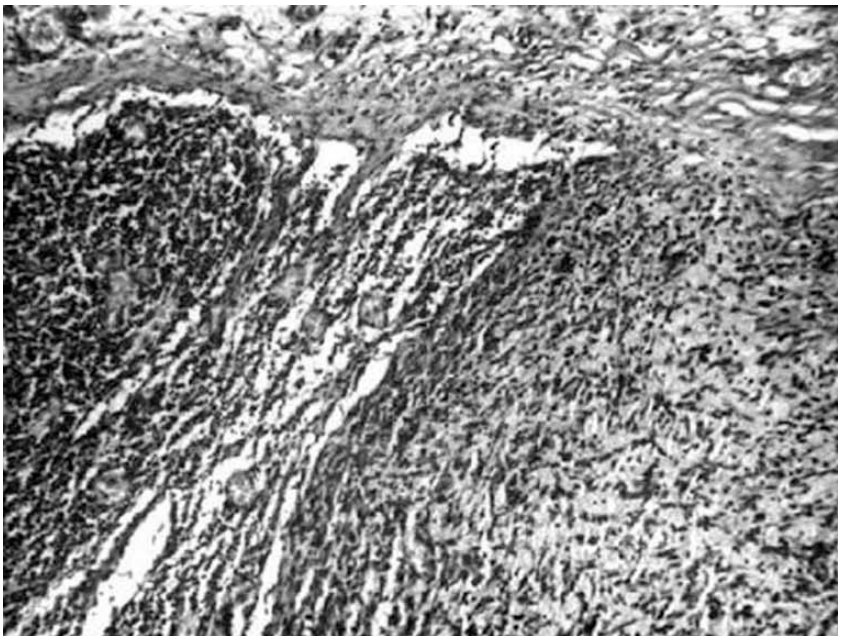

Fig. 4 - *Histological section of the lymph node showing the preserved lymphoid tissue on the left and metastatic zone of the same peculiarity with the main tumor on the right (H-E x magnification).*

logical variability and architectural pattern. The rules of the therapy are firm; wide, "en-bloc" radical resection of the lesion with a wide margin of safety of the uninvolved tissue. Unexpected clinical behavior like cervical lymphatic metastasis may be observed during therapy. In such exceptional cases, the standard therapeutic approach should be modified to include postoperative adjuvant radiotherapy.

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