Dear Editor,

Malignant peripheral nerve sheath tumors (MPNST) include a group of tumors that originate from the peripheral nerves or show differentiation along various elements of the nerve sheath, namely, Schwann cells, perineural fibroblasts, or fibroblasts (1). MPNST is rare soft tissue sarcoma with an incidence of 0.001% in the general population and it represents 5-10% of all such tumors with slight male predominance (2-5). One half to two thirds occur from neurofibromas or in the setting of neurofibromatosis type-1. It can increase to 5-42% in patients with neurofibromatosis type-1 (6). MPNSTs behave in an aggressive fashion, and carry a poorer prognosis than other soft tissue sarcomas (7). MPNSTs arise in deep soft tissues of trunk and extremities, but superficial primary MPSNT with a cutaneous or subcutaneous origin have rarely been reported.

A 22-year-old male patient presented with a swelling in the right forearm that had been existing since childhood. There was no related trauma, local pain or infection at this localization and he had no significant history associated with neurofibromatosis. Physical examination revealed a painless, non-pulsatile, spherical subcutaneous mass that protruded about 1 cm above the skin surface. The tumor mass was completely resected with part of skin covering on it. The cut surface was greyish white in color and solid. Microscopically, multinodular tumor organization was observed which cover the whole dermis and extending subcutaneous adipose tissue. The tumor consisted of atypical epitheloid cells which some had spindled-shape, had ovaloid-round, hyperchromatic-vesicular nucleus and widely eosinophilic cytoplasm (Figure 1). Regressive changes like necrosis, hyalinization were seen in restricted areas. The mitotic activity was high (30/10 high-power fields) (Figure 2). Because there were no benign features, these findings indicated that the tumor didn’t originate de novo or from malignant transformation of neurofibroma. Immunohistochemical studies played a decisive role in diagnosis. Our case showed S-100, Vimentin, GFAP, CD68 positivity with over-expression of Ki-67 (mean 30%) (Figure 3). Metastatic malign melanoma and monophasic synovial sarcoma were included in differential diagnosis. Immunostaining EMA, CK7 and CD99 for synovial sarcoma; HMB45 and Melan-A for metastatic melanoma were used to distinguish from MPNST. They were all negative. Other markers, such as CK, CK19, Desmin, CA-125, CD31, CD34, Factor VIII didn’t expressed in ‘MPNST of the dermis’ and were used exclude other tumors. By this findings, it was diagnosed as MPNST of cutaneous tissue.

Figure 1. The tumor cells are pleomorphic obviously with ovaloid-round, hyperchromatic-vesicular nuclei and eosinophilic cytoplasm’s (H&E, X100).
The differential diagnosis between benign schwannoma and neurosarcoma may be challenging: One must look for necrotic foci, the number of atypical mitoses, and an absence of differentiated cells (6). Our case showed features that favor MPNST include hyperchromasia, large nucleoli, increased mitoses and necrosis.

Metastases arise in 39% of patients, lung being the most common metastatic site (6).

The treatment of option is surgery, but postoperative radio- and chemotherapy are part of integrated therapy. Gross total resection of the tumor is the most important therapeutic goal. When radical tumor removal is not possible, excision combined with radiation therapy seems to be the best alternative treatment. With the latest advances in molecular genetics, the target therapy for this tumor type is expected to be discovered (8-10).

As some authors have indicated, the survival rates of patients with MPNSTs were significantly better for superficial tumors (11). Positive tumor margins are defined as the most important prognostic marker (12). Tumors larger than 5 cm, deeper tissue location, histological grades II and III, an association with neurofibromatosis, and regional or distant metastases advise a bad prognosis (6). In our patient, the tumor mass was completely resected with negative surgical margins. Adjuvant therapy didn’t considered.

MPNST can arise in any unusual site. It may not be exist in or around a major nerve tissue. The diagnosis of MPNST of the cutis is based on combining clinical, histopathological and immunohistochemical results. Complete surgical removal should be the goal of treatment with definitive histological diagnosis (13).

References

1. B.S. Ducatman, B. W. Scheithauer, D. G. Piepgras, H. M. Reiman, D. M. Ilstrup, Malignant peripheral nevre sheath tumors. A Clinicopathologic Study of 120 Cases. Cancer 1986;57(10); 2006-2021.

2. Wang J, Ou, S.W. Guo, Z.Z., Wang, Y.J., Xing, D.G. Microsurgical Management of Giant Malignant Peripheral Nerve Sheath Tumor of the Scalp: Two Case Reports and a Literature Review. World Journal of Surgical Oncology 2013; 11: 269.

3. Hajdu, S.I. Peripheral Nerve Sheath Tumors; Histogenesis, Classification and Prognosis. Cancer 1993; 72: 3549-3552.

4. Baehring JM, Betensky RA, Batchelor TT. Malignant peripheral nerve sheath tumor: the clinical spectrum and outcome of treatment. Neurology 2003;61:696-8

5. Wanebo JE, Malik JM, VandenBerg SR, Wanebo HJ, Driesen N, Persing JA. Malignant peripheral nerve sheath tumors. A clinicopathologic study of 28 cases. Cancer 1993;71:1247-53

6. Panigrahi S, Mishra SS, Das S, Dhir MK. Primary malignant peripheral nerve sheath tumor at unusual location. J Neurosci Rural Pract 2013;4:583-6

7. Wan S, Zhou H, Yu J, Ma Y, Li J, Zhan R. Giant malignant peripheral nerve sheath tumors of the occipital scalp. Asian Biomedicine 2011; 5: 713-719.
8. Aguiar Vitacca S, Sarrazin D, Henry-Amar M, Spielmann M, Genin J, Bernheim A, et al. [Neurosarcoma associated with Von Recklinghausen disease: apropos of 25 cases observed at the Gustave Roussy Institute from 1967 to 1990]. Bull Cancer 1992;79:101-12

9. Ducatman BS, Scheithauer BW, Piepgras DG, Reiman HM, Ilstrup DM. Malignant peripheral nerve sheath tumors. A clinicopathologic study of 120 cases. Cancer 1986;57:2006-21

10. Ferner RE, Gutmann DH. International consensus statement on malignant peripheral nerve sheath tumors in neurofibromatosis. Cancer Res 2002;62:1573-7

11. Allison KH, Patel RM, Goldblum JR, Rubin BP. Superficial malignant peripheral nerve sheath tumor: a rare and challenging diagnosis. Am J Clin Pathol 2005;124:685-92

12. Angelov L, Davis A, O’Sullivan B, Bell R, Guha A. Neurogenic sarcomas: experience at the University of Toronto. Neurosurgery 1998;43:56-64; discussion 64-5

13. Elias MM, Balm AJ, Peterse JL, Keus RB, Hilgers FJ. Malignant schwannoma of the parapharyngeal space in von Recklinghausen’s disease: a case report and review of the literature. J Laryngol Otol 1993;107:848-52