International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2018; 4(3): 534-536

www.orthopaper.com
Received: 05-05-2018
Accepted: 06-06-2018

Mohamed Ali Sbai
Department of Orthopedic Surgery and Trauma, MT Maamouri Hospital, Nabeul, Tunisia

Sofien Benzarti
Department of Orthopedic Surgery and Trauma, MT Maamouri Hospital, Nabeul, Tunisia

Wafa Gharbi
Department of Orthopedic Surgery and Trauma, MT Maamouri Hospital, Nabeul, Tunisia

Myriam Khechimi
Department of Plastic surgery, La Rabta Hospital, Tunis, Tunisia

Riadh Maalla
Department of Plastic surgery, La Rabta Hospital, Tunis, Tunisia

Correspondence
Mohamed Ali Sbai
Department of Orthopedic Surgery and Trauma, MT Maamouri Hospital, Nabeul, Tunisia

Neurofibrosarcoma of the median nerve of the hand: A case report

Mohamed Ali Sbai, Sofien Benzarti, Wafa Gharbi, Myriam Khechimi and Riadh Maalla

DOI: https://doi.org/10.22271/ortho.2018.v4.i3j.95

Abstract
Neurofibrosarcoma is a rare malignant nerve sheath tumor with a lot of histological entities. In 70% of the cases, it is associated with neurofibromatosis type 1 (NF1). We report the case of a 44-year-old female patient without neurofibromatosis, who was diagnosed with a neurofibrosarcoma of the median nerve of the left hand. The location in the hand of neurofibrosarcoma is exceptional because of its histological nature, especially outside the context of neurofibromatosis. The treatment involves surgery, chemotherapy, and radiotherapy with a high risk of local recurrence.
We provide through this case report a review of the literature and discuss the diagnosis, histological features, hypothetical etiologies, different therapeutic options and prognosis of this tumor.

Keywords: Tumor, peripheral nerve, MPNST, neurofibrosarcoma, median nerve, hand, surgery

Introduction
Neurofibrosarcoma or Malignant Peripheral Nerve Sheath Tumor (MPNST) is a very rare tumor, its incidence is 1 in 100 000 in the general population, they account for approximately 5–10% of all soft tissue sarcomas and it has a poor prognosis, with only 20%–50% of patients surviving 5 years from diagnosis [1]. Neurofibrosarcoma is associated with neurofibromatosis von Recklinghausen or neurofibromatosis type 1 (NF1) in 70% of the cases [2]. The diagnosis is difficult, the symptoms are non-specific, but some indirect manifestations explained by tumor compression or infiltration could be observed [3].
The treatment of MPNST remain a non-standardized treatment representing a great challenge between the efficiency of the surgery, the indication of radiotherapy and chemotherapy, and a usual necessity for a radical surgery.

Case report
We report the case of a 44-year-old, right handed man, without any specific medical history and without any signs of NF1 or relatives with NF1. He presented with a swelling of the subcutaneous tissue on the palmar aspect of the left hand evolving for 4 years; associated with hypoesthesia of the palm of the hand. On physical examination the tumour measured 10 cm. The overlying skin was normal (Fig.1). On palpation we found a nodular swelling, with firm consistency, adherent to the deep and the superficial layers. Hypoesthesia in the territory of the median nerve was noted. We did not notice any movement disorders. The examination of lymph nodes was strictly normal.

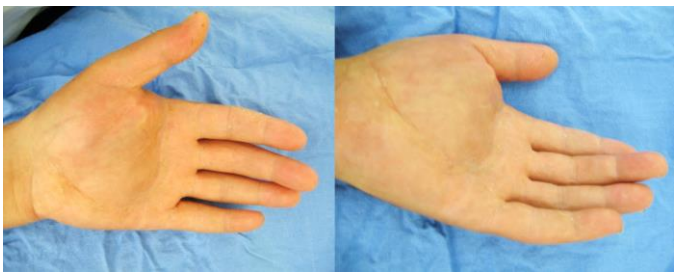

Fig 1: clinical aspect of the tumor of the left hand.

Plain radiograph of the left hand showed a densification of the soft parts without osseous invasion (Fig.2). MRI showed a lesion related to the median nerve, slightly hyper intense in T1, frankly hyper intense in T2 and strongly enhances after Gadolinium with fuzzy boundaries, intra-tumoral hemorrhage, peri-tumoral edema and compression of the neurovascular bundle, strongly evocative of malignancy.

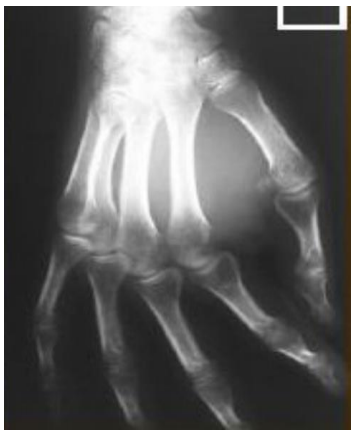

Fig 2: Plain radiograph of the left hand showing a densification of the soft parts without osseous invasion.

A palmar surgical approach to the swelling finds a tumor connected to the median nerve, poorly delimited, adhering the deep and the superficial layers and whose total tumoral resection was impossible (Fig.3). An excisional biopsy of the tumor was performed. The histological study concluded to a neurofibrosarcoma of high grade (Fig.4).

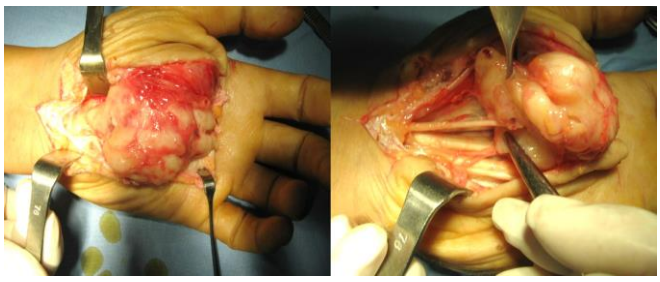

Fig 3: intra-operative view showing a poorly limited lesion connected to the median nerve.

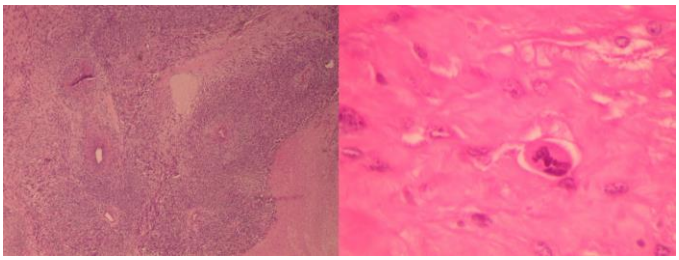

Fig 4: Malignant mesenchymal proliferation made of spindle cells in variable density with wide ranges of necrosis (HES X10), very atypical cells with high nucleocytoplasmic ratio (HES X40).

The patient was operated under general anaesthesia, he had an amputation of the forearm, and an apparatus of the upper limb was manufactured (Fig.5). The adjuvant therapy could not be completed because the patient was lost of sight. The specimen was sent for histopathological examination; the result was obtained after 15 days confirming the diagnosis of high grade neurofibrosarcoma.

The patient was lost of sight shortly after surgery. He died after 4 years; the cause of death was not specified.

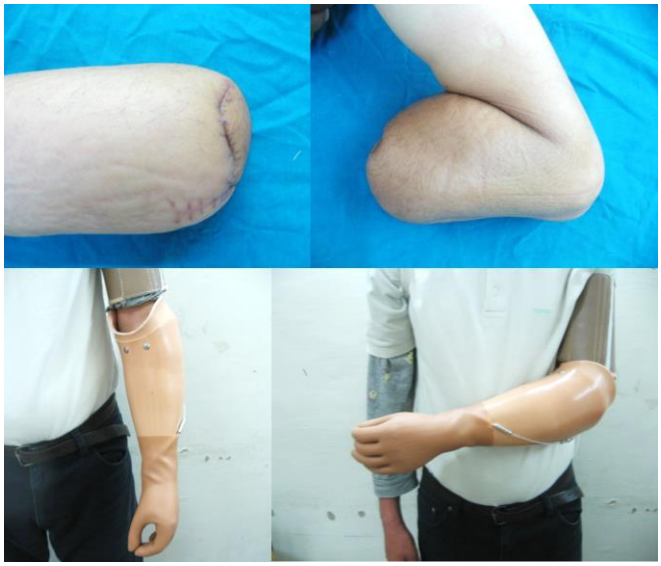

Fig 5: amputation of the forearm with an apparatus of the upper limb.

Discussion

With an incidence of about one per 100 000, MPNST are very rare entities of soft tissue sarcoma [1]. MPNST may occur in association with neurofibromatosis type 1 (NF1) or independently [4]. Neurofibrosarcomas are aggressive sarcomas that usually develop in deep soft tissues.

Some Conditions or associated diseases are risk factors, favorizing the occurrence of MPNST, including NF1 that is considered as the principal risk factor, and the second known one for developing an MPNST is the exposure to radiation decades prior to occurrence of MPNST. Indeed, 50% of MPNST occur in patients with NF1 and the risk of developing this tumor in patients with NF1 is estimated to 5%, frequently arising from preexisting neurofibromas [5, 6].

Patients with an intragenic NF1 gene deletion appear to be at greater risk of developing this tumor [6, 7]. Similarly, prior radiotherapy has been implicated as a risk factor in developing a MPNST in about 4 to 11% of cases and after a latent period between 2 and 26 years [7, 8]. Our patient had none of these risk factors.

In fact, plexiform neurofibromas are likely to transform into neurofibrosarcoma because of the presence of undifferentiated Schwann cells that appear to be capable of inducing a malignant transformation. Monitoring patients with NF1 and plexiform neurofibroma should be very attentive, even more if they are numerous or extensive plexiform neurofibromas. Painful plexiform neurofibroma, rapid increase of its size, hardening of its consistency or the appearance of a neurological deficit should alert to a malignant transformation to a neurofibrosarcoma [9, 10].

Magnetic Resonance Imaging (MRI) is necessary to provide an accurate state of local extension before surgery [11, 12].

Precise diagnosis of neurofibrosarcoma is only obtained after surgical biopsy with histological examination. The minimal criteria to distinguish malignant from benign nerve sheath tumor are; Marked cell crowding, generalized nuclear enlargement, nuclear hyperchromasia, mitotic rate over 5/10. The identification of a sarcoma as nerve sheath sarcoma requires at least one of the following four criteria; Arises from a peripheral nerve, arises from a pre-existing benign nerve sheath tumor like neurofibroma, in a patient with known NF1 the tumor displays histologic features typical of MPNST, evidence of nerve sheath differentiation. Histologic appearance is variable but it frequently resembles

pleomorphic undifferentiated sarcoma or fibrosarcoma [9, 10].
Treatment consists mainly in surgery, complete surgical excision continues to be the gold standard, but there is a considerable lack of uniform recommendations for the resection margin regarding MPNST. Amputation proves to be necessary if complete excision is no longer possible [11-13].
About adjuvant therapy, the benefit of chemotherapy regarding local recurrence, metastasis and overall survival seems to be low. It has never been adequately studied and is, therefore, still being controversially discussed [14]. Other studies found that irradiation could improve local control [15].
In general, MPNST is known to have high metastatic potential and poor prognosis. Reported long-term outcomes vary widely across multiple series, with 5-year survival ranging between 15% and 50%.
High tumor grade and a tumor size over 5 cm are poor prognostic indicators for disease-specific survival (DSS) [16].

Conclusion

MPNST or neurofibrosarcoma is a rare malignant nerve sheath tumor with a lot of histological subtypes. In 70% of cases, it is associated with NF1. The management team of neurofibrosarcoma should include specialists in surgery, genetics, pathology, and oncology. A complete and wide excision should improve the survival rates whereas the contribution of radiotherapy and chemotherapy has not been proven. MPNST patients with and without NF1 have similar DSS, although NF1 patients appear to have an increased overall mortality, which may result from increased mortality from causes other than MPNST.

References

1. Kolberg M, Høland M, AAgesen TH, Brekke HR, Liestøl K, Hall KS *et al*. Survival meta-analyses for> 1800 malignant peripheral nerve sheath tumor patients with and without neurofibromatosis type 1. Neuro-Oncol. 2012; 15(2):135-147.
2. Goertz O, Langer S, Uthoff D, Ring A, Stricker I, Tannapfel A *et al*. Diagnosis, treatment and survival of 65 patients with malignant peripheral nerve sheath tumors. Anticancer Res. 2014; 34(2):777-783.
3. Rodriguez FJ, Folpe AL, Giannini C, Perry A. Pathology of peripheral nerve sheath tumors: diagnostic overview and update on selected diagnostic problems. Acta Neuropathol (Berl). 2012; 123(3):295-319.
4. Pourtsidis A, Doganis D, Baka M, Bouhoutsou D, Varvoutsi M, Synodinou M *et al*. Malignant peripheral nerve sheath tumors in children with neurofibromatosis type 1. Case Rep Oncol Med, 2014.
5. Kattan MW, Leung DH, Brennan MF. Postoperative nomogram for 12-year sarcoma-specific death. J Clin Oncol. 2002; 20(3):791-796.
6. Grobmyer SR, Reith JD, Shahlaee A, Bush CH, Hochwald SN. Malignant peripheral nerve sheath tumor: molecular pathogenesis and current management considerations. J Surg Oncol. 2008; 97(4):340-349.
7. Tucker T, Wolkenstein P, Revuz J, Zeller J, Friedman JM. Association between benign and malignant peripheral nerve sheath tumors in NF1. Neurology. 2005; 65(2):205-211.
8. Thiagarajan A, Iyer NG. Radiation-induced sarcomas of the head and neck. World J Clin Oncol. 2014; 5(5):973.
9. Higham CS, Dombi E, Rogiers A, Bhaumik S, Pans S, Connor SEJ *et al*. The characteristics of 76 atypical neurofibromas as precursors to neurofibromatosis 1 associated malignant peripheral nerve sheath tumors. Neuro-Oncol. 2018; 20(6):818-25.
10. Miettinen MM, Antonescu CR, Fletcher CDM, Kim A, Lazar AJ, Quezado MM *et al*. Histopathologic evaluation of atypical neurofibromatous tumors and their transformation into malignant peripheral nerve sheath tumor in patients with neurofibromatosis 1-a consensus overview. Hum Pathol. 2017; 67:1-10.
11. Vasconcelos RAT de, Coscarelli PG, Alvarenga RP, Acioly MA. Malignant peripheral nerve sheath tumor with and without neurofibromatosis type 1. Arq Neuropsiquiatr. 2017; 75(6):366-71.
12. Friedrich RE, Diekmeier C. Peripheral nerve sheath tumors of the upper extremity and hand in patients with neurofibromatosis type 1: topography of tumors and evaluation of surgical treatment in 62 patients, 2017.
13. Steinau HU, Steinsträsser L, Langer S, Stricker I, Goertz O. Surgical margins in soft tissue sarcoma of the extremities. Pathol. 2011; 32(1):57-64.
14. Kroep JR, Ouali M, Gelderblom H, Le Cesne A, Dekker TJA, Van Glabbeke M *et al*. First-line chemotherapy for malignant peripheral nerve sheath tumor (MPNST) versus other histological soft tissue sarcoma subtypes and as a prognostic factor for MPNST: an EORTC soft tissue and bone sarcoma group study. Ann Oncol. 2010; 22(1):207-214.
15. Carli M, Ferrari A, Mattke A, Zanetti I, Casanova M, Bisogno G *et al*. Pediatric malignant peripheral nerve sheath tumor: the Italian and German soft tissue sarcoma cooperative group. J Clin Oncol. 2005; 23(33):8422-8430.
16. Stucky CCH, Johnson KN, Gray RJ, Pockaj BA, Ocal IT, Rose PS *et al*. Malignant peripheral nerve sheath tumors (MPNST): the Mayo Clinic experience. Ann Surg Oncol. 2012; 19(3):878-885.