Title: spindle cell malignancy of the oral cavity: an unusual case report

ABSTRACT :

Malignant peripheral nerve sheath tumour (MPNST) of the mandible is an uncommon tumour that develops either from a preexisting neurofibroma or de novo. Malignant peripheral nerve sheath tumour are sarcomas which originate from peripheral nerves or from cells associated with the nerve sheath, such as Schwann cells, perineural cells, or from fibroblasts. Because MPNSTs can arise from multiple cell types, the overall appearance can vary greatly from one case to the next. A case of MPNST of the right side of mandible in a 23year female is reported.

Key words: Malignant peripheral nerve sheath tumour (MPNST), spindle cells, schwann cells, fibrosarcoma.

Introduction:

The principal malignancy of peripheral nerve origin is preferably called a Malignant Peripheral Nerve Sheath Tumour.1 MPNST also termed as spindle cell malignancy neurilemmoma, neurogenic sarcoma, neurofibrosarcoma.2-3 It is an extremely rare malignancy, encountered in patients with neurofibromatosis type I with an incidence of 2-5% while in the general population it has an incidence of 0.001%.4-6  MPNSTs are mainly located in the buttocks, thighs, brachial plexus, and para-spinal region and is rare in the head and neck region.7-8

**Case report :**

A female patient of age 23 years reported to the Department Of Oral Medicine and Radiology with a chief complaint of pain and swelling in the lower right side of jaw since 1month. Past history revealed that patient had visited a dentist 6months back with a complaint of pain, swelling and mobility of teeth in the same region. Panoramic radiograph was advised and it showed a radiolucent lesion extending from midline to distal aspect of 46. Patient was advised for a minor surgical procedure during which extractions and incisional biopsy was performed. Histopathological report revealed that it was a case of fibrosarcoma. Patient complains that there is a recurrence of swelling and pain in the same region since 1 month for which she was referred to our hospital. The pain is sharp intermittent and localized in nature, aggravates while eating food and gets relieved on medication. The recurrent swelling was initially small in size and has attained the present size within 1 month.

On general physical examination the patient was moderately built and nourished with vital signs within the normal limits. On examination an extra-oral swelling is seen on the right side of the mandible which is extending from midline to right ramus of the mandible , superior-inferiorly from corner of the mouth to 5cm below the inferior border of the mandible crossing the midline of size measuring 5\*8cm, margins of the swelling are well defined. On palpation the swelling is hard in consistency, fixed to the underlying structures and tender. I/O examination showed missing 31,32,41,42,43,44,45,46 and a diffuse swelling in the right of the alveolus measuring about 6\*2 cm extending anteriorly from 31 to 47 posteriorly with obliteration of buccal vestibule. On palpation there was buccal cortical plate expansion which is non tender and firm.(fig 1) Based on the history, past history and clinical examination recurrent fibrosarcoma was given on the right side.

Further investigations where carried out. Panoramic , occlusal, CBCT, CT and chest radiograph were advised. Panoramic radiograph revealed irregular shaped radiolucency , ragged borders on the right side of mandible extending from distal aspect of 32 to mesial socket of 48, superoinferiorly from the crest of the ridge to the inferior border of the mandible, destruction of mental foramen and thinning of the inferior border of the mandible. Missing 31, 32, 41-47. Occlusal radiograph revealed pathologic fracture on the right side. To know the extent of the lesion CBCT was advised, CBCT revealed few bone islands with complete destruction of both buccal and lingual cortical plates. CT scan revealed a large lobulated enhancing soft tissue density mass lesion measuring 5\*3.7\*6.3cm seen on the body and ramus of the mandible, right buccal mucosa gingivobuccal sulcus extending upto retromolar region. Few subcentimeter lymph nodes on right side at level two largest measuring 6\*7mm.(fig 2) To know the metastasis a chest radiograph was advised which reported to be normal.

Patient was subjected to incisional biopsy. Histopathology showed highly cellular connective tissue stroma composed of mixed population of cells predominantly spindle cells arranged in streaming fascicles. Findings were suggestive of spindle cell sarcoma. To confirm the diagnosis IHC investigation was performed. The tissue was strongly reactive for vimentin, S-100, NSE (fig 3) and negative for cytokeratin and CD 34. Hence favouring the diagnosis for MPNST. The patient was referred to a regional oncology institute for further evaluation and management. Excision of the lesion was done where hemimandibulectomy was performed and the specimen was sent for IHC investigation.(Fig 4) The excision biopsy report confirmed the diagnosis of MPNST. Compiling the information obtained by the radiological, hIstopathological. IHC investigations a final diagnosis of MPNST was arrived.

Discussion :

A sarcoma is defined as a MPNST when at least one of the following criteria is met:

1. It arises from a peripheral nerve.
2. It arises from a preexisting benign nerve sheath tumor (neurofibroma).
3. It demonstrates  [Schwann cell](http://en.wikipedia.org/wiki/Schwann_cell)  differentiation on histologic examination9

Malignant peripheral nerve sheath tumor (MPNST) is an uncommon sarcoma with an incidence of 1:100 000/year, compromising 5%–10% of all soft tissue sarcomas (STS). MPNST originates from or recapitulates the phenotype of peripheral nerves cells, such as Schwann cells or perineural cells. Although the histogenesis of MPNST remains unclear, there is a higher incidence in patients with prior radiation exposure and Neurofibromatosis type 1 (NF1), who have a lifetime risk of 10% of developing MPNST . MPNST typically arise in the extremities (40%), followed by trunk/retroperitoneal (38%) and head and neck region (21%) . Most MPNSTs are biologically high-grade sarcomas that tend to recur (40%–65%) and metastasize (40%–80%) . MPNST usually metastasize hematogenous, most commonly to the lungs.10

Most of MPNSTs occur in the age group of 20-50years with an equal predilection to male and female.8-9 Usually MPNSTs are found in the extremities and the trunk and, unlike benign schwannomas, are seldom found in the head and neck area.11 Oral tumors may occur anywhere but the most common sites are the mandible, lips, buccal mucosa, paranasal sinus, nasal cavity, orbit, cranial nerves, larynx, parapharngeal or pterygomaxillary space, minor salivary glands and the thyroid gland. 1,8 The present case comprises an extremely unique presentation of this malignancy involving the mandible on the right side in a 23year old female. Clinically, they present as an enlarging mass, often associated with pain and nerve deficit.12

CT is useful in assessing the tumour extension and eventual metastasis (the more frequent are bone and lung metastasis). MRI can reveal the nerve of origin, and it is more accurate to evaluate the topographical relationship of the tumour with neighboring structures, especially vascular, muscular structures and fat planes involvement. In particular MRI distinguishes the lesion from the fat tissue better than CT, whose dislocation and thinning of the fat tissue thickness have a critical importance in localizing the space of origin of a neck lesion.4 [Fine needle aspirations](http://en.wikipedia.org/wiki/Fine_needle_aspiration)  or FNAs is a biopsy method employed to obtain individual cells for  [cytologic](http://en.wikipedia.org/wiki/Cytopathology)  review. It can be done with a very small needle which is more easily tolerated by the patient and is often useful to establish the presence of malignant cells. A second type of biopsy is a core needle or tru-cut needle biopsy, which uses a larger hollow-bored needle gauge to obtain a more substantial tissue sample. This type of sample offers inspection of both individual cells as well as the architectural arrangement of those cells within a given part of the tumor mass.9 Approximately 80-85% of MPNSTs are spindle cell tumors with fasciculating patterns that contain histologic features similar to those of a fibrosarcoma. They are often high-grade, demonstrating 4 or more mitotic figures per high powered field. The remaining 15% of MPNSTs is composed of tumors that exhibit variable differentiation, allowing them to be sub-classified as distinct entities. A MPNST with rhabdomyoblastic differentiation is characterized by both neural and skeletal muscle differentiation. Within this category is the malignant triton tumor, which refers specifically to a MPNST occurring in association with rhabdomyosarcoma. Other examples of MPNSTs with differentiation include glandular malignant schwannoma, epithelioid malignant schwannoma, and superficial epithelioid MPNST.9 In 50-70% of the MPNSTs, scattered tumor cells express S 100 protein. S-100 positivity is not seen in other spindle cell sarcomas. Also, some cases of MPNST stain positive for neuron specific enolase.

In our case of MPNST the tissue was strongly and diffusely positive for Vimentin, S100 and Neuron-specific enolase.8

The mainstay of treatment is surgical resection. The goal of the operation is to achieve complete surgical excision of the tumor with negative (wide) margins. This offers the best outcome with respect to both local recurrence and distant metastases.9 Radiation therapy can be employed in preoperative, intraoperative, and postoperative settings . Treatment with adjuvant radiotherapy has yielded a statistically significant reduction in the rates of local disease recurrence. Studies have shown the average 5-year survival rate for these patients ranges from 16% to 52%.

CONCLUSION:

MPNST are very infrequent diseases of the head and neck region and in young patients without Neurofibromatosis I syndrome. In our case, MPNST was seen in a young female patient involving the mandible without neurofibromatosis I syndrome, which is said to be rare as stated in the literature. A combination of clinical, pathological, and immunohistochemistry helps in diagnosing these tumors. Though multimodality therapy, including surgical resection and adjuvant radiotherapy, is available, the prognosis remains dismal. Modern clinical studies and the development of effective targeted chemotherapy are needed to gain control of the disease.

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