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Neurology

KEY WORDS: MM-multiple myeloma, Peripheral neuropathy-PN, POEMS- Polyneuropathy Organomegaly Endocrinopathy Monoclonal gammopathy and Skin abnormalities, HGN-Hypoglossal nerve.

THE RAREST PRESENTATION OF MULTIPLE MYELOMA AS HYPOGLOSSAL NERVE MONONEUROPATHY

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ABSTRACT

A 47-year-old woman presented with a 3-day history of left-sided tongue deviation with numbness, dysarthria, and headache without any other neurological deficits. On evaluation, she was found to be having multiple myeloma involving clivus, skull bones and vertebrae.

Case- Report:

A 47-year-old woman presented with a 3-day history of left-sided tongue deviation with numbness. This was accompanied by dysarthria, and headache without any other neurological deficits.

Workup:

MRI BRAIN revealed multiple heterogeneously hyperintense lesions involving the entire skull and both inner and outer tables. T2/FLAIR hyperintense ill-defined lesion noted in the clivus on left. There is an expansion of the base of the skull. PET-CT showed metabolically active multiple lytic skeletal lesions in the skull, cervical, dorsal, lumbar, sacral vertebrae, pelvic bones, and both femur and humerus. BONE MARROW BIOPSY showed 85% cellularity, few erythroid and myeloid precursors with a prominence of round cells, moderate cytoplasm, and eccentric nuclei (plasma cells) and few prominent nucleoli (plasmacytoblast) arranged in sheets and interstitial pattern. Megakaryocytes are 2-3/HPF, Grade II condensation of reticulin suggesting that trephine biopsy sections are consistent with multiple myeloma.

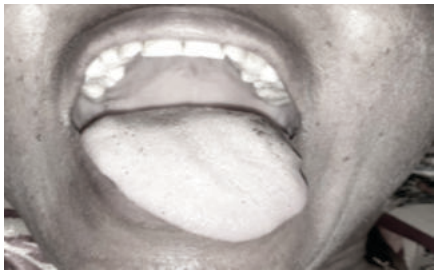

Figure 1 Left HGN palsy with a deviation of the tongue to left

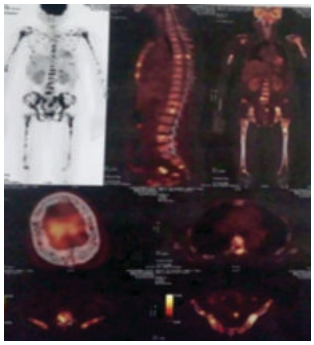

Figure 2 PET-CT shows multiple metabolically active lytic lesions.

DISCUSSION:

Malignant plasma cell dyscrasias are characterized by neoplastic proliferation of a single clone of plasma cells, typically producing a monoclonal immunoglobulin called a paraprotein.

Among them, plasmacytoma and MM represent a spectrum and probably the natural progression of the same illness.

- MM is defined by the presence of the paraprotein in the serum and/or urine (serum > 3 g/dl), at least 10 % neoplastic plasma cells in the bone marrow or their presence in other tissue, and evidence of end-organ damage, related to the underlying plasma cell disorder, including hypercalcemia (C), renal failure (R), anemia (A), and bone lesions (B), commonly named CRAB symptoms acronymically.

- Plasmacytoma is defined by the presence of a localized plasma cell tumor without evidence of neoplastic plasma cells in bone marrow (< 5 %) and the absence of other features of myeloma. Both can present as solitary or multiple lesions; the latter is more predictive of progression to myeloma. The POEMS syndrome is a paraneoplastic disorder associated with the presence of a bone plasmacytoma and is considered the same entity as osteosclerotic myeloma.

MM frequently causes neurologic symptoms, although very rarely does the disease directly invade the central nervous system. Patients can present with almost the whole spectrum of neurologic complaints, affecting areas such as the peripheral and central nervous system (Table-1)

Table 1Neurological complications associated with MM and plasmacytoma

Peripheral nervous system	Central nervous system	Drug-related neurotoxicity
Radiculopathy	Spinal-cord compression	Toxic encephalopathy, seizures
Axonal neuropathy	Cranial plasmacytoma	Herpes zoster and post-herpetic neuralgia
Demyelinating neuropathy	Dural plasmacytoma	Steroid myopathy
Small-fibre neuropathy	Leptomeningeal myelomatosis	Encephalopathy, seizures
Carpal tunnel syndrome	Brain plasmacytoma	Reversible posterior leucoencepha-lopathy syndrome (anecdotal)
Amyloid myopathy	Stroke	
	Cerebral vein thrombosis	
	Hyperviscosity syndrome	
	Papilloedema	
	Pachymeningitis	
	Toxic encephalopathy, seizures	

Direct Complications of Myeloma and Plasmacytoma:

1. Spinal Complications:

The most frequent neurologic symptom in these individuals is radicular pain, occasionally accompanied by weakness and numbness, caused by compression of the nerve roots by a pathological vertebral fracture with secondary foraminal stenosis or by the direct extension of a vertebral plasmacytoma.

2. Cranial Complications:

Patterns of intracranial MM include (1) osteo-dural MM and (2) brain parenchyma plasmacytoma Osteo-dural plasmacytoma is the most frequent form of cranial plasma-cell neoplasm, usually arising from osseous lesions in the cranial vault, skull base, nose, or paranasal sinuses. Clinical presentation includes pain, headache, seizure, or cranial palsies.

3. Leptomeningeal Complications:

It is defined as the detection of malignant monoclonal plasma cells in the cerebrospinal fluid in the presence of suggestive symptoms such as radiculopathy, cauda equina syndrome, encephalopathy, and cranial palsies

Remote complications of Myeloma and Plasmacytoma:

1. Peripheral Nervous System:

PN is a frequent remote manifestation of malignant plasma cell neoplasms. It can be found in the setting of classical MM or be associated with plasmacytoma of the bone, as part of the POEMS syndrome. The characteristics of neuropathy are like those of chronic inflammatory demyelinating polyneuropathy (CIDP), and patients may be misdiagnosed with idiopathic CIDP or monoclonal gammopathy of underdetermined significance associated with neuropathy.

2. Cerebrovascular Complications:

Stroke and venous thrombosis have been classically described with MM, related to hyper viscosity syndrome and thrombophilia.

Metabolic Complications of Myeloma and Plasmacytomas:

Renal insufficiency with uraemia, hypercalcaemia, and hyperammonaemia, can precipitate or aggravate an encephalopathy or cause seizures. Regardless of its origin, MM-associated encephalopathy is more frequently seen in the terminal stages of the disease.

Treatment-Related Neurologic Complications:

Neurological impairment in these patients can be due to the therapy with cytostatic drugs (vincristine, high dose melphalan), immunomodulatory drugs such as thalidomide or corticosteroids, and bortezomib.

The commonest neurological complications of MM are spinal cord compression from plasmacytoma and peripheral polyneuropathy due to amyloid deposition. An isolated HNP as with our patient is a rare presentation. The common cranial nerves involved are II, III, IV and VI. A review article focusing on MRI of the course of the hypoglossal nerve demonstrates how any interruption of the nerve course at the clivus or condyle due to pathologies such as bone destruction or tumour invasion leads to the mononeuropathy

CONCLUSION:

This case is clinically significant for several reasons. There were cases of cranial nerve neuropathies caused by multiple myeloma (MM) related to compression of CN III by a plasmacytoma (solid soft tissue mass of myeloma cells), myelomatous meningitis, and hyper viscosity syndrome. This is the lone instance in the literature that the authors are aware of where a cranial nerve anomaly has arisen owing to the pathophysiological consequences of the illness. Furthermore, this instance has clinical significance because the hypoglossal nerve impingement was the first outward sign of a rapidly progressing illness.

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