Skull base plasmacytoma

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- Combining morphological and functional imaging parameters to diagnose primary bone neoplasms in the skull base, spine and sacrum

Skull Base Plasmacytoma: Overview and Considerations

Definition

A **skull base plasmacytoma** is a rare solitary plasma cell tumor arising in the bones of the skull base. It is a form of **solitary bone plasmacytoma (SBP)**, which may either remain localized or progress to **multiple myeloma**.

Clinical Features

- **Symptoms:** Depend on location and compression of adjacent structures. Common presentations include:

1. Cranial nerve palsies (e.g., diplopia, facial numbness, dysphagia)
2. Headaches
3. Hearing loss or tinnitus (if affecting the petrous bone)
4. Nasal obstruction (if extending into the nasopharynx)

- **Age group:** Most common in middle-aged to elderly patients.

Radiological Findings

- **CT scan:** Osteolytic lesion with possible bone erosion. - **MRI:** T1 hypointense, T2 hyperintense, and strong post-contrast enhancement. - **PET-CT:** Helps assess systemic involvement.

Diagnosis

- **Histopathology:** Biopsy confirms monoclonal plasma cell proliferation. - **Immunohistochemistry:** Demonstrates light chain restriction. - **Serum and Urine Electrophoresis:** Assess M-protein presence to exclude multiple myeloma. - **Bone Marrow Biopsy:** Essential to rule out systemic disease.

Treatment

- **Radiotherapy (RT):** First-line treatment for localized disease (40–50 Gy). - **Surgical Resection:** Rarely indicated unless for decompression or biopsy. - **Systemic Therapy:** If there is progression to multiple myeloma.

Prognosis and Follow-up

- **Good prognosis** if truly localized. - **Regular follow-up** required due to risk of progression to multiple myeloma.

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see Parasellar plasmacytoma

see Clivus plasmacytoma.

Case reports

Two cases of plasmacytic neoplasms at the skull base where the differential diagnosis included pituitary adenoma when the tumor was sellar/suprasellar, or other bone-related tumors such as chordoma/chondrosarcoma when clivus/sphenoid bones were involved. The use of cytologic preparations facilitated intraoperative diagnosis [1)]

Despite its limitations, the study highlights an underappreciated role of cytology in skull base tumor diagnosis. It alerts clinicians and pathologists to consider solitary plasmacytoma in the differential diagnosis of sellar/suprasellar and clival tumors, particularly when cytology is available.

However, the study would benefit from:

A discussion on differential pitfalls (e.g., plasmacytoid pituitary adenomas). Correlation with other diagnostic modalities. Larger-scale validation to confirm diagnostic reliability. While valuable for raising awareness, its clinical impact remains limited without further validation. Future research should explore standardized cytologic criteria, incorporate a prospective cohort, and compare alternative intraoperative techniques

A 41-year-old man presented with concerns of headache, diplopia, and left eye strabismus. His brain's magnetic resonance image (MRI) showed a large expansile mass measuring 51 mm involving the clivus and central skull base. Trans-sphenoidal tumor decompression was done. A biopsy confirmed the plasmacytoma. Positron emission tomography-computed tomography (PET-CT) scan showed a single 2-(18F) fluoro-D-glucose (FDG) avid lesion at the skull base. The results of all other relevant investigations such as hemoglobin, renal function test, serum calcium, serum protein immunoelectrophoresis, serum quantitative immunoglobulin, bone marrow biopsy, serum lactate dehydrogenase, and beta-2 microglobulin levels were within normal limits. He was treated with radical radiotherapy. He developed a complete clinical response after radiotherapy [2].

A case of typical Gradenigo's syndrome, including left abducens nerve palsy, left facial pain and paresthesia in V1 and V2 distribution of trigeminal nerve caused by solitary osseous plasmacytoma of the left petrous apex. The patient was a 46-year-old man who presented with diplopia for two days. Magnetic resonance imaging (MRI) of the brain showed a hyperintense mass on T1-weighted images and slightly hypointense mass on T2-weighted images in the left petrous apex and left parasellar area. Through a left subtemporal middle fossa approach, subtotal resection of the lesion was performed. Histopathological examination of the lesion revealed plasmacytoma. The patient received 54 Gy radiation for the local tumor. Four months after radiation, the abducens palsy improved. Four years after treatment, the patient remained well with no symptoms or signs of local recurrence or progression to multiple myeloma [3].

1)
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2)
Siyag A, Soni TP, Gupta AK, Sharma LM, Jakhotia N, Sharma S. Plasmacytoma of the Skull-base: A Rare Tumor. Cureus. 2018 Jan 15;10(1):e2073. doi: 10.7759/cureus.2073. PMID: 29552435; PMCID: PMC5854301.
3)
Khalatbari MR, Hamidi M, Moharamzad Y. Gradenigo's syndrome as first presentation of solitary osseous plasmacytoma of the petrous apex. Arch Iran Med. 2014 Jul;17(7):526-8. doi: 0141707/AIM.0016. PubMed PMID: 24979569.