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SKULL BASE METASTATIC ADENOCARCINOMA OF UNKNOWN PRIMARY: CASE REPORT

Neurosurgery

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ABSTRACT

Metastasis to the skull-base particularly affects patients with carcinoma of the breast and prostate. Clinically, the key feature is progressive ipsilateral involvement of cranial nerves. Magnetic resonance imaging (MRI) is nowadays the most useful examination to establish the diagnosis but plain films, CT scans with bone windows and isotope bone scans remain helpful to demonstrate bone erosion. The treatment depends on the nature of the underlying tumor. Radiotherapy is generally the standard treatment. The overall prognosis is poor, with an overall median survival of about 2.5 years, probably because skull-base metastases appear late in the course of the disease.

KEYWORDS

Metastasis, Skull base, Magnetic resonance imaging

INTRODUCTION:

Like all bones, the skull is a common site of metastases from systemic cancers. Skull base metastasis which involve ethmoid and sphenoid bones as well as the basal parts of frontal, temporal and occipital bones are difficult to detect as compared to calvarial metastasis.

CASE REPORT:

40 Years old male, with no known comorbidities, presented with right ear purulent discharge since 6 months. On examination, Pulse was 74/min and BP-110/70mmHg. He was found to have bilateral VIth nerve palsy, right sided VII, VIII, IX, X, XI, XIIth nerve palsy and right sided cerebellar signs. Chest and abdominal examination was normal. Routine blood investigations were within normal limits. CT Brain showed ill defined lytic destructive lesions of the skull base involving basiocciput, clivus, mastoid and squamous part of the temporal bone with sclerosis of mastoid air cells on the right side. MRI Brain showed evidence of T2 isointense lesion measuring 6.4 X 6.12 cms infiltrating the right cavernous sinus and clivus crossing midline, laterally extending to deep lobe of parotid, inferiorly extending to the basiocciput and basisphenoid with extradural extension to right lateral cerebellar convexity with heterogenous contrast enhancement of the lesion (Fig 1). CT Chest, Abdomen was normal, Urine PSA was normal. Patient underwent Suboccipital retromastoid craniectomy, debridement of bony lesion done which was highly vascular, dura was found to be intact. Post operative course was uneventful. Final histopathology showed neoplastic growth with glandular pattern suggestive of moderately differentiated metastatic adenocarcinoma (Fig 3). Patient was adviced adjuvant RT.

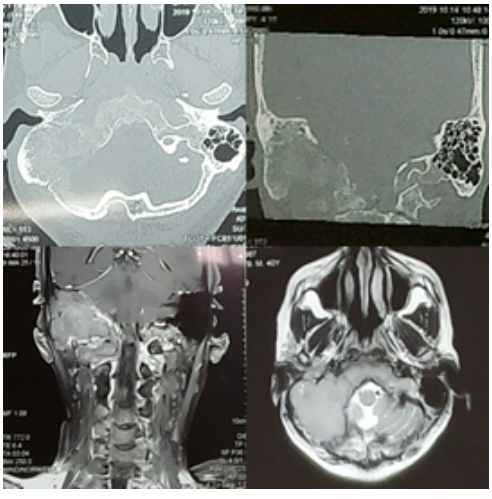

Fig 1: CT Brain showed ill-defined osteolytic lesion involving Rt.temporal base and basiocciput. On MRI Brain, found to be T2 isointense and heterogenous contrast enhancing lesion .

Fig 2: Clinical photo of patient

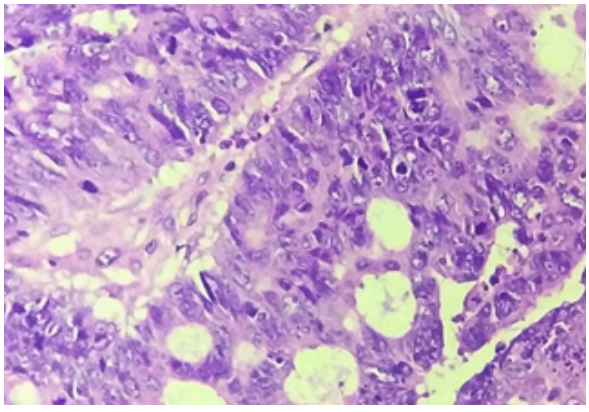

Fig 3: Moderately differentiated adenocarcinoma with glandular pattern

DISCUSSION:

Skull-base metastasis from distant tumors occurs in 4% of cancer patients. The three most frequent culprits are breast, lung, and prostate cancers. Not surprisingly, prostate carcinoma is the first cause of skull metastases in men [1] while breast carcinoma is the leading cause in women [2]. However, dissemination to the skull-base may occur in many other cancers including colon, renal or thyroid cancers, lymphoma, melanoma, and neuroblastoma. Skull-base metastasis is generally a late event in the course of the disease at a stage where many

patients, from 20 to 100% according to the primary cancer, already have disseminated disease, particularly other bone metastases.

Direct hematogeneous spread, particularly from a lung metastasis of a primary tumor, most likely accounts for the majority of skull-base metastases. Another possible mechanism, especially in prostate cancer, is retrograde seeding through the Batson's valveless venous plexus that connects pelvic structures with the skull through epidural and dural veins Skull-base metastases may be clinically silent, becoming symptomatic when their growth produces pain or cranial nerves palsies [3]. As a general rule, the appearance of cranio-facial pain in a patient with cancer should alert the clinician to this complication. Clinical manifestations depend upon the metastatic site. In a retrospective study of 43 patients treated for base-of-skull metastasis, Greenberg et al. identified five clinical syndromes of different frequencies: the orbital (7%), parasellar (16%), middle-fossa (35%), jugular foramen (16%) and occipital condyle syndromes (21%)[4]. However, 33% of skull base metastases were in locations other than the ones associated with the five described symptoms. In the present study, patient presented with posterior fossa symptoms with involvement of cranial nerves VI through XII. Even if the diagnosis is suspected, the exact anatomic location of the lesion remains uncertain in some cases because the size of the metastasis may vary considerably among patients with similar clinical findings, from a single skull-base foramina to the whole base of the skull. A "hemibasis syndrome" is sometimes present, characterized by a progressive ipsilateral paralysis of at least seven of the cranial nerves, occurring in the absence of long tract signs, and without raised intracranial pressure [5].

Nowadays, magnetic resonance imaging (MRI) using T2 and T1-weighted sequences before and after intravenous gadolinium administration is the best method test to detect skull-base metastases [6]. The main finding in osseous metastasis consists of a substitution of the usual hyperintense fat signal by an hypointense lesion on non enhanced T1-weighted images, [17] with a variable appearance on T2-weighted sequences. T1-weighted sequences with fat suppression technique show variable enhancement after gadolinium administration [7]. MRI appears also particularly useful to demonstrate the invasion of the cavernous sinus, showing widening or the thickening of its wall, with a usual decrease or absence of enhancement after gadolinium infusion. Skull-base CT-scan with bone windows and if needed additional orbital views [8] is the best method to show bone lesions whose aspect is generally lytic. However, an osteoblastic or mixed pattern may be seen, particularly in prostate cancers The main interest of radionuclide bone scan is its great sensitivity in detecting bone metastases. fail to demonstrate skull base metastasis, although radionuclide bone scans revealed metastatic deposits in the skull base in 30–50% of patients [9]. However, in case of purely osteolytic lesions, radionuclide bone scans will be insufficient with a superiority of PET study in such lesions. A few reports suggest that dual-isotope SPECT may be helpful when it shows a focus of abnormal uptake of 99mTc-HMDP in the skull-base which is in agreement with the clinical findings [10]. Occasionally, a biopsy is needed to establish the diagnosis. Biopsy may be performed in accessible lesions of the anterior cavernous sinus either by an orbital fine needle aspiration biopsy, or by transsphenoidal biopsy, to rule out an infectious disease such as sino-orbital aspergillosis [11]. In other regions of the skull-base, a surgical approach is usually more perilous. Finally, CSF examination is important to exclude meningeal carcinomatosis. The diagnosis of skull-base metastasis may be particularly difficult when the patient is not known to have cancer or when radiological confirmation is lacking, a feature that does not exclude the diagnosis.

The prognosis of skull-base metastases depends upon the nature and dissemination of the primary tumor, as well as the site, extension and (rarely) surgical accessibility of the metastasis itself [12,13]. As stated above, the development of skull-base metastases is often a late event in the course of a cancer disease and death is generally due to the systemic progression of the disease. Treatment of skull base metastasis, as for all metastasis, is palliative. The goal of treatment is relief of symptoms. Radiotherapy is the mainstay of treatment, especially when delivered focally with Gamma Knife or other forms of stereotactic radiotherapy. Chemotherapy or hormonal therapy, may be helpful in some types of cancers (Breast and prostate). Surgery is limited for selected patients with limited disease and relatively long life expectancy. Surgical approach is determined by the location of the metastasis and by the symptoms that the operation is meant to ameliorate.

CONCLUSION:

Despite their frequencies and severity, skull-base metastases remain somewhat neglected complications of systemic cancer, as illustrated by the relative modesty of available literature on this subject. However, knowledge of skull-base metastases is important for the clinician because the diagnosis is often difficult, particularly in patients without known cancer or if the radiological work up is in default. Early treatment is crucial if one wishes to improve potentially extremely disabling symptoms.

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