

Metastatic involvement of Meckel's

cave

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Section: Neuroradiology

Imaging Technique: MR

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Case Type: Clinical Cases

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Patient: 70 years, male

Clinical History:

A 70 year-old female patient with a history of breast carcinoma referred with consistently increasing headache and left facial pain over the last few months.

Imaging Findings:

A 70 year-old female patient suffering from breast carcinoma referred with consistently increasing headache and left facial pain over the last few months. MRI study of the cranium was performed on a 1.5 T MR scanner. SE T1, FSE T2, post-gadolinium SE T1 weighted sequences were obtained on three orthogonal planes. MRI pictures revealed multiple heterogeneously contrast enhancing foci of the calvarial bones, consistent with bony metastases. Leptomeningeal layers overlying brain parenchyma were thick and showed prominent contrast enhancement, representing leptomeningeal metastases. A soft tissue mass was seen in Meckel's cave on the left. This lesion was isointense to the cerebral parenchyma, and showed intense contrast enhancement. A lumbar puncture was performed. The cerebrospinal fluid (CSF) opening pressure was increased. CSF analysis revealed low levels of glucose, high levels of protein, and malignant cells.

Discussion:

Breast cancer, lung cancer, and melanoma are the most common neoplasms causing leptomeningeal metastases. Leptomeningeal metastases constitute approximately 8 % of all central nervous system metastases. They cause a low-grade meningitis syndrome characterized by headache, neck rigidity, papillary edema, and cranial nerve dysfunctions. The trigeminal nerve is one of the most commonly affected cranial nerves in leptomeningeal metastases, and it can be involved from its nuclei to its peripheral branches. Histopathologically there is cellular infiltration of pia and arachnoid layers with reactive inflammatory changes, and it often extends along perivascular spaces into the brain parenchyma. MRI studies usually cannot detect leptomeningeal metastases in non-contrast images. However CSF spaces may lose their low signal in T1-weighted sequences, and may be seen as very bright areas in T2-weighted or in FLAIR sequences even without contrast material. MR images show linear or nodular enhancing leptomeninges, following contrast administration. The presence of a Meckel's cave mass in association with leptomeningeal and calvarial deposits is highly suggestive for metastases. Lymphomatous meningitis, sarcoidosis, granulomatous meningitis, dural metastases can be easily ruled out by their associated clinical and imaging findings. Prognosis is poor in patients with leptomeningeal metastases.

Differential Diagnosis List: Metastatic involvement of Meckel's cave

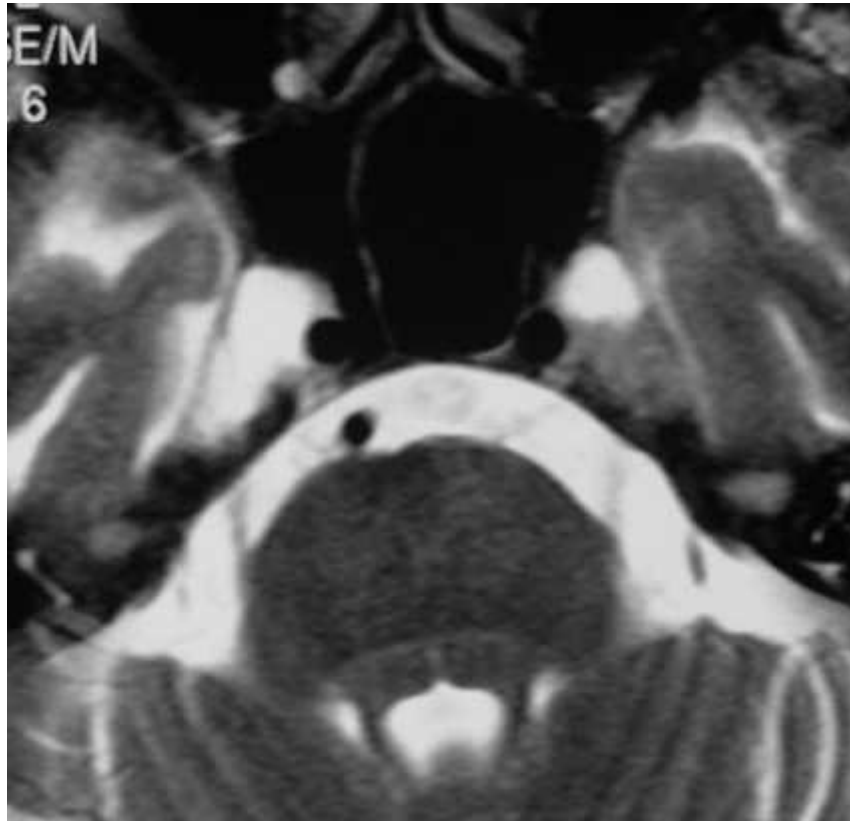
Final Diagnosis: Metastatic involvement of Meckel's cave

References:

- Mastronardi L, Lunardi P, Osman Farah J, Puzzilli F. Metastatic involvement of the Meckel's cave and trigeminal nerve. A case report. J Neurooncol 1997 Mar;32(1):87-90. (PMID: [9049867](#))
- Hutchins LG, Harnsberger HR, Hardin CW, Dillon WP, Smoker WR, Osborn AG. The radiologic assessment of trigeminal neuropathy. AJR Am J Roentgenol 1989 Dec;153(6):1275-82. (PMID: [2816646](#))
- Hirota N, Fujimoto T, Takahashi M, Fukushima Y. Isolated trigeminal nerve metastases from breast cancer: an unusual cause of trigeminal mononeuropathy. Surg Neurol 1998 May;49(5):558-61. (PMID: [9586936](#))
- Nemzek WR. The trigeminal nerve. Top Magn Reson Imaging 1996 Jun;8(3):132-54. (PMID: [8840469](#))
- Majoie CB, Verbeeten B Jr, Dol JA, Peeters FL. Trigeminal neuropathy: evaluation with MR imaging. Radiographics 1995 Jul;15(4):795-811. (PMID: [7569130](#))

Figure 1

a



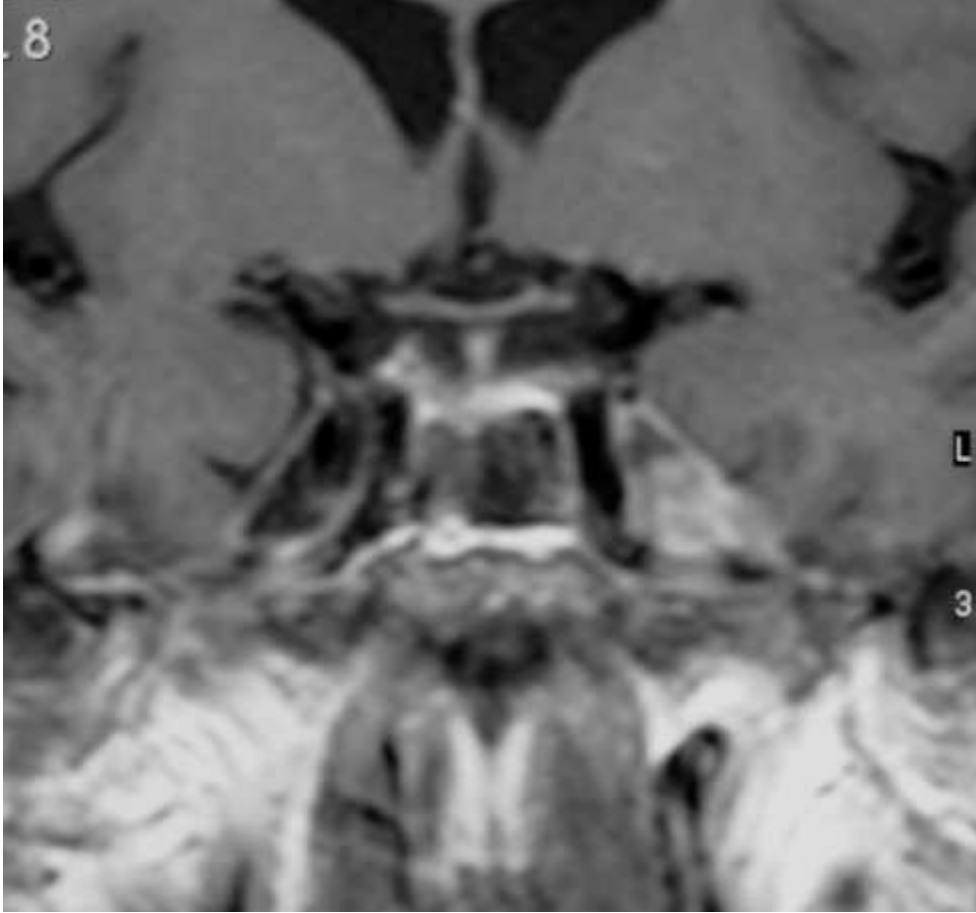
Description: Axial FSE T2-weighted MR image of the base of cranium shows a soft tissue mass, isointense to cerebral parenchyma, within Meckel's cave on the left. **Origin:**

b



Description: Axial post-gadolinium SE T1-weighted MR image shows intense contrast enhancement of the soft tissue mass which is located in Meckel's cave on the left. **Origin:**

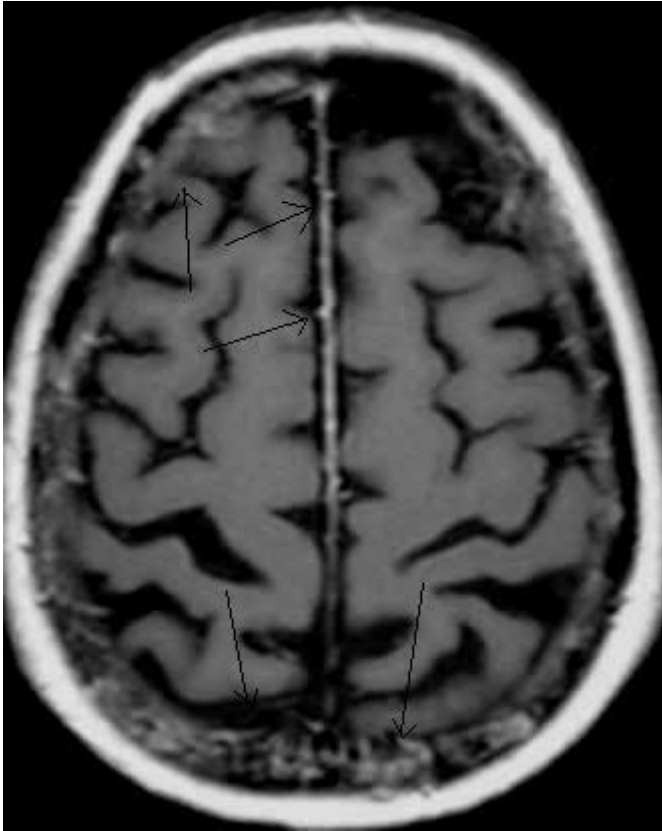
c



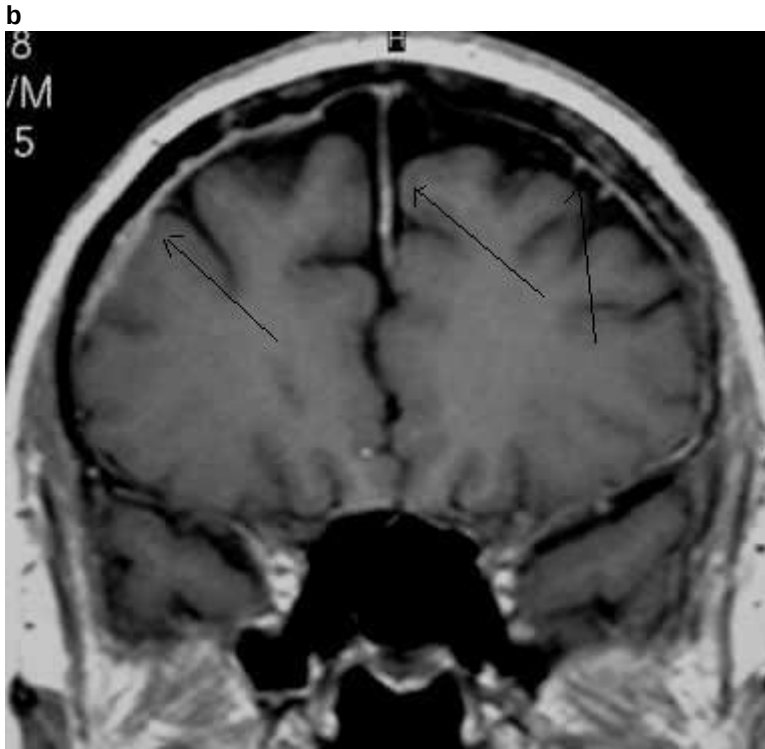
Description: Coronal post-gadolinium SE T1-weighted MR image shows intense contrast enhancement of the soft tissue mass which is located in Meckel's cave on the left. **Origin:**

Figure 2

a



Description: Coronal post-gadolinium SE T1-weighted MR image of the cranium shows leptomeningeal layers overlying bilateral frontal lobes are thick and with prominent contrast enhancement (arrows). Some foci of contrast enhancement are seen within the calvarial bones. **Origin:**



Description: Axial post-gadolinium SE T1-weighted MR image of the cranium shows contrast enhancing microdroules along the falx cerebri, some areas of leptomeningeal deposits overlying parenchyma (arrows) and multiple foci of contrast enhancement within the calvarial bones. **Origin:**