Leptomeningeal Metastasis from Esophageal Adenocarcinoma: A Case Report

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LAB RESULTS

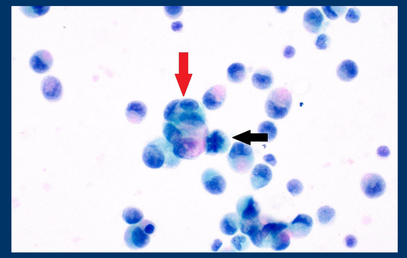

Fig. 1 The red arrow shows a cluster of neoplastic cells reminiscent of an adenocarcinoma, while the black arrow indicates a neoplastic cell undergoing mitosis.

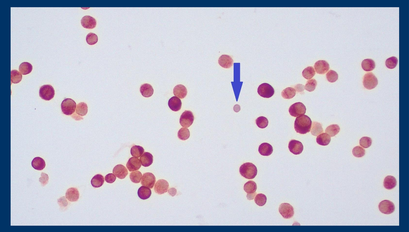

Fig. 2 All the neoplastic cells have been stained positively with cytokeratin 7 (CK7), a common marker used for detection of cells of epithelial origin. The blue arrow shows a lymphocyte, which is not stained by the cytokeratin.

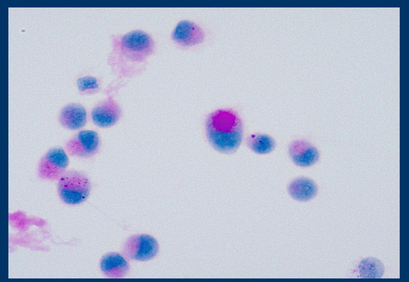

Fig. 3 The cytoplasm of the neoplastic cells has a bright magenta color, which signifies the positivity of the PAS stain and the presence of mucous. The nuclei, which do not contain mucous, are cyan-colored.

INTRODUCTION

Leptomeningeal metastasis (LM) is the infiltration and multifocal seeding of leptomeninges by malignant cells, occurring in approximately 3–8% of patients with advanced solid malignancies. It most commonly arises from breast cancer (41%), followed by lung cancer (24%), and melanoma (12%), and its incidence is increasing due to availability of newer diagnostic modalities and advanced systemic treatment [1].

In contrast, leptomeningeal involvement from esophageal carcinoma is exceedingly rare, with fewer than 30 cases reported worldwide, accounting 0.16% - 0.19% of cases [2].

Diagnosis remains challenging due to the often subtle neurological presentation and the low sensitivity of initial cerebrospinal fluid (CSF) cytology.

CASE PRESENTANTION

A 57-year-old man was admitted to our Department for management of a gastroesophageal junction adenocarcinoma. Staging with computed tomography (CT) and endoscopic evaluation confirmed a locally advanced tumor without distant metastases.

The patient received four cycles of neoadjuvant chemotherapy, after which he developed gradually progressive frontotemporal headache unresponsive to analgesics. Initial brain magnetic resonance imaging (MRI) was unremarkable (Figure 4).

He subsequently underwent partial esophagogastrectomy, and histopathology revealed moderately differentiated adenocarcinoma (ypT1bN1, R0).

Postoperatively, the patient experienced worsening headache accompanied by tinnitus and hearing disturbance. Neurological assessment and repeat MRI remained negative. Three consecutive CSF cytologies were performed; the first two were negative, while the third confirmed malignant cells consistent with metastatic adenocarcinoma (Figure 1, 2, and 3). The patient developed progressive lethargy and decreased level of consciousness. Emergency brain CT revealed hydrocephalus (Figure 5), and despite supportive care, the patient succumbed ten days after CSF confirmation of leptomeningeal metastasis.

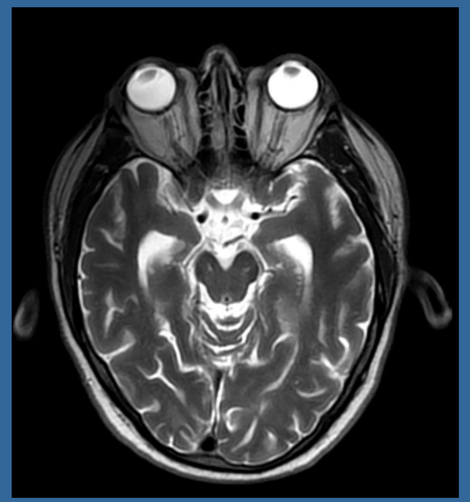

Fig. 4 Pre-operative MRI screening (T2)

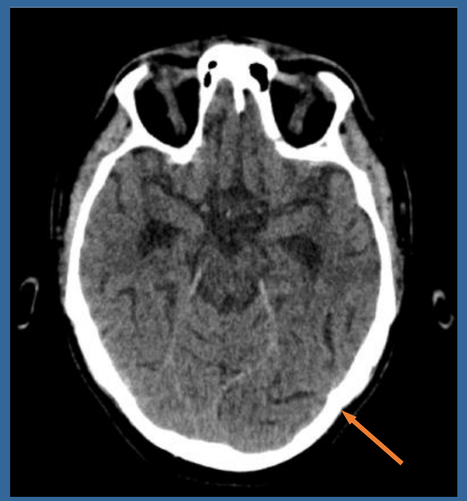

Fig. 5 Post-operative CT – scan showing hydrocephalus

CONCLUSIONS

Leptomeningeal metastasis is one of the rarest complications observed in tumors of esophageal and GE junction origin.

This case underscores the importance of maintaining clinical vigilance for leptomeningeal spread in patients with esophageal adenocarcinoma presenting with new neurological symptoms.

Early recognition and repeated diagnostic assessment are essential, although overall outcomes remain unfavorable. Future research must focus on establishing consistent, effective treatment protocols beyond current generalized strategies.

DISCUSSION

Leptomeningeal dissemination from esophageal adenocarcinoma is exceptionally uncommon and signifies terminal-stage disease. Risk factors related to LM development are not acknowledged, although associations have been found with higher lymph node stage, the presence of other metastases (particularly liver, lung and bone) and the human epidermal growth factor receptor 2 (HER2) overexpression [3].

Besides headache, it may present with variable manifestations such as seizures, visual disturbances, altered mental status, limb weakness, sensory loss and radicular pain. Nausea, vomiting and confusion are signs and symptoms designating CSF obstruction. The diagnosis of LCM involves a combination of CSF studies from lumbar puncture and neuroimaging, ideally MRI with gadolinium [4]. The presence of malignant cells consists the gold standard [1].

Repeated CSF sampling is often required for diagnostic confirmation. Prognosis remains poor despite multidisciplinary management, as treatment options are limited to radiation therapy, systemic chemotherapy, intrathecal therapy, and combination therapy. . Based on the literature, survival from the time of diagnosis ranged from less than a month up to 7 months [5].

REFERENCES

1. Aulakh, Amardeep Singh et al. "Leptomeningeal Carcinomatosis in Esophageal Cancer: Case Report and Review of Literature." *Journal of gastrointestinal cancer* vol. 43 Suppl 1 (2012): S84-8.
2. Jagtap, Sunil Vitthalrao et al. "Leptomeningeal Carcinomatosis Secondary to Esophageal Cancer Diagnosed on Cytology." Journal of neurosciences in rural practice vol. 11,3 (2020): 495-497.
3. Baccili Cury Megid, Thais et al. "Leptomeningeal carcinomatosis and brain metastases in gastroesophageal carcinoma: a real-world analysis of clinical and pathologic characteristics and outcomes." Journal of neuro-oncology vol. 167,1 (2024): 111-122
4. Ahmed, Mashrafi et al. "Leptomeningeal carcinomatosis from oesophageal cancer, presenting as meningitis." BMJ case reports vol. 2016 bcr2015210974. 6 Jan. 2016
5. Lukas, R V et al. "Leptomeningeal carcinomatosis in esophageal cancer: a case series and systematic review of the literature." Diseases of the esophagus : official journal of the International Society for Diseases of the Esophagus vol. 28,8 (2015): 772-81