Cerebrospinal fluid (CSF) rhinorrhea after medical therapy for pituitary prolactinoma is a rare but well-described entity. However, to our knowledge, no CSF leaks have been reported after the non-surgical treatment of pituitary or anterior skull base metastases.

We report this unusual case to raise awareness of spontaneous CSF leaks in the setting of skull base metastatic disease. All members of the treatment team should be aware of this possibility after initiation of systemic chemotherapy and tumor regression, and urgently refer patients for repair if a leak should develop prior to the development of meningitis.

Abstract

Cerebrospinal fluid (CSF) rhinorrhea after medical therapy for pituitary prolactinoma is a rare but well-described entity. However, to our knowledge, no CSF leaks have been reported after the non-surgical treatment of pituitary or anterior skull base metastases.

We report this unusual case to raise awareness of spontaneous CSF leaks in the setting of skull base metastatic disease. All members of the treatment team should be aware of this possibility after initiation of systemic chemotherapy and tumor regression, and urgently refer patients for repair if a leak should develop prior to the development of meningitis.

Introduction

Cerebrospinal fluid (CSF) rhinorrhea is a rare but well described entity after the medical therapy of a pituitary prolactinoma [1,2]. A robust response to dopamine agonist therapy leads to rapid shrinkage of the tumor, which had previously eroded the sellar floor skull base dura and/or bony structures, therefore leading to a conduit between the nasal passages and the subarachnoid space. Interestingly, although the mechanism for most cases is due to tumor shrinkage from medical management allowing the opening of a previously formed sinus tract, there are reports of macroprolactinomas causing CSF rhinorrhea immediately after starting medical therapy even without any evident shrinkage on imaging [3]. Further, pituitary neoplasms may also present with CSF rhinorrhea as their heralding symptom, before medical therapy is initiated [4].

This phenomenon has also been reported with other functional and non-functional pituitary tumors treated with medical intervention [1]. Recently, a similar clinical presentation was published in a patient treated with chemotherapy for a recurrent atypical meningioma [5]. Even further, leaks have been demonstrated after stereotactic radiosurgery for pituitary pathology [6]. Plausibly, any patient with a skull base neoplasm responsive to non-surgical intervention could suffer CSF rhinorrhea if the tumor has eroded the dura and bone and a robust response to medical therapy “reveals” these defects.

Case Presentation

A 66-year-old woman presented to her pulmonologist with shortness of breath and was subsequently with a new lung mass and multiple smaller systemic lesions. Stage IV EGFR-mutant adenocarcinoma of the lung was diagnosed after biopsy of the chest mass. She noted continual headaches, and so MRI of the brain was performed and an enhancing mass of the pituitary gland and skull base was found (Figure 1). The pituitary lesion was suspected to represent metastatic lung cancer. Further, systemic chemotherapy was initiated after biopsy of the skull base tissue. Her headaches improved somewhat and repeat imaging demonstrated almost immediate reduction in tumor size.

One week later she noted clear right nasal discharge and a mild cough. Her oncologist suspected allergic rhinosinusitis, but the symptoms failed to improve with antihistamine medication. When the patient followed up with the neurosurgical service in outpatient clinic six weeks after hospital discharge, she was diagnosed with a presumptive cerebrospinal fluid leak and we recommended urgent admission to the hospital. Given the chronicity of her symptoms, she elected instead to schedule endoscopic exploration and repair on an outpatient basis a week later. Unfortunately, days after her clinic visit, she suffered high-grade fevers, stiff neck, and progressive headache, and she came to the emergency department for meningitis. Broad-spectrum antibiotics were initiated and she was admitted to the intensive care unit. Repeat MRI demonstrated dramatic regression of the pituitary mass (Figure 2) and high-resolution CT did not reveal an obvious leak site. Once medically stabilized, she proceeded to the operating room for repair of the leak.

Discussion / Conclusions

We report a case of systemic erlotinib therapy leading to CSF rhinorrhea in a patient with stage IV adenocarcinoma of the lung due to rapid shrinkage of a sellar/clival metastasis.

This mechanism appears similar when compared to other treatment modalities, whereby a tumor regresses quickly allowing exposure of a previously created CSF leak from tumor invasion of bone and dura.

Surgical repair of these leaks is technically simple and is crucial to perform prior to the development of meningitis.

Surgical and non-surgical providers for this patient population should be vigilant of CSF leak as a dangerous source of rhinorrhea.

References


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