

Breaking Barriers: A Case of Leptomeningeal Disease

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Introduction: Leptomeningeal Disease (LD), defined as metastatic disease to the arachnoid and pia mater, is a rare complication of solid tumors and only occurs in five percent of metastatic disease. Ten percent of LD is secondary to breast cancer (BC). Here, we present a 57 year old female with LD secondary to BC.

Case: A 57-year-old Latin female with past medical history of thyroid cancer, uterine fibroids and stage IIIC (T4d, N1, M0, G2) triple negative invasive ductal carcinoma of the left breast, BRACA 1/2 negative, presented with intractable back pain, lower extremity (LE) numbness and saddle anesthesia. She was status post Adriamycin, Cytosan, Taxol, Xeloda, bilateral mastectomy, and radiation. Physical exam demonstrated decreased bilateral LE sensation, decreased bilateral LE weakness and decreased bilateral ankle deep tendon reflex. Thoracic magnetic resonance imaging with and without contrast illustrated numerous nodular enhancing lesions throughout the intrathecal aspect of the canal extending into the thoracic and lumbar region concerning leptomeningeal metastatic process. Lumbar puncture demonstrated increased white blood cell count and decreased glucose count. She was treated with intravenous immunoglobulin and dexamethasone. Cerebrospinal fluid (CSF) cytology demonstrated numerous discohesive tumor cells with severe nuclear atypia and increased nuclear/cytoplasmic ratio. An Ommaya reservoir was performed and 12 mg intrathecal methotrexate administered. Patient was discharged home with significant improvement of symptoms.

Discussion: LD has a median survival of 2 months. CNS tumor involvement is attributable to low penetration of the blood brain barrier of systemic medications (i.e. trastuzumab). The addition of intrathecal therapy (commonly with methotrexate, cytarabine and thiopeta) is considered palliative and recommended for patients with tumor cells found in CSF and/or linear diffuse enhancing LM given its poor penetration into larger tumoral lesions. Radiation including stereotactic radiosurgery or whole brain radiotherapy has shown no benefit except for localized large LM lesions or CSF obstruction. To date, different combinations of current therapies and new systemic drugs, such as targeted therapies with monoclonal antibodies, small tyrosine kinase molecules, or modified chemotherapeutic agents are under investigation and hold promising results for systemic and intrathecal treatment of LD.

Learning Objectives

Upon completion of this lecture, learners should be better prepared to identify leptomeningeal disease as a manifestation of metastatic breast cancer and have high level of suspicion when a the patient develops acute lower back pain, saddle anesthesia and lower extremity weakness. The learner should be able to demonstrate that CSF pathology samples and MRI thoracic spine with contrast are diagnostic tools to establish the diagnosis of leptomeningeal disease and if done expeditiously allow prompt palliative intrathecal treatment.

References and Resources

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