



,SVLFOCFSH 5VNPS XJUI -FQUPNFOJOHFBM \$B "DPVTUJD /FVSPNB

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Abstract

Objective: /HSWRPHQLQJHDO FDUFLQRPDWRVLV /06 LV GH¿QHG DV WKH GLIIXVH and subarachnoid space by malignant cells metastasizing from systemic cancer. Patients usually have a known underlying malignancy, but primary presentation can be with symptoms of meningeal involvement. We describe a rare case of Krukenberg tumor with LMS initially presented as bilateral progressive sensorineural hearing loss, which was misdiagnosed as acoustic neuroma.

Patient: A 50 year old man with a history of cervical cancer was referred to the Ear Nose and Throat (ENT) clinic because of progressive hearing loss, tinnitus, dizziness and blurred vision for 5 months.

Results: A CT scan of the abdomen and pelvis showed a right adnexal mass, suspicious for an ovarian neoplasm. The patient underwent surgical resection of her pelvic mass. Surgical pathology revealed poorly differentiated adenocarcinoma with scattered signet ring cells, favorable with metastatic gastric adenocarcinoma. Magnetic resonance imaging revealed abnormal leptomeningeal enhancement. A lumbar puncture was performed, the CSF analysis showed elevated protein and positive for signet malignant cells.

Conclusion: Our case highlights the importance of the development of new diagnostic tools and treatment regimens for LMC.

Keywords: Gastric cancer; Krukenberg tumor; Leptomeningeal and pelvis showed a right adnexal mass, suspicious for an ovarian carcinomatosis; Intrathecal methotrexate therapy; Whole brain irradiation

Introduction

A Krukenberg tumor refers to the "signet ring" subtype of metastatic tumor in the ovary that metastasized from a primary site, classically the gastrointestinal tract, although it can arise in other tissues such as the breast [1]. Gastric adenocarcinoma, especially at the pylorus, is the most common source [2].

Leptomeningeal Carcinomatosis (LMC) is the dissemination and growth of cancer cells within leptomeningeal space [3]. It is a rare but devastating complication of malignancy. It is a more frequent manifestation of advanced or metastatic carcinoma and is commonly seen in patients with leukemia, breast cancer and lung cancer [4].

LMC has been rarely reported with gastric adenocarcinoma with a prevalence of only 0.14%-0.24% [4,5]. On average, LMC is diagnosed within 1 year of the diagnosis of the primary cancer [4]. However, the diagnosis of cancer for some patients may be delayed until a few months after the onset of neurological symptoms.

We describe such a case of Krukenberg tumor with LMC initially presented as bilateral progressive sensorineural hearing loss, which were thought to be due to acoustic neuroma.

Case Report

A 50 year old female initially presented to the Ear Nose and Throat (ENT) clinic complaining of left ear fullness, bilateral hearing loss, dizziness and imbalance for five months. Magnetic resonance imaging (MRI) of the brain revealed a cerebellar vermis lesion and enhancement of bilateral auditory canals. Her symptoms were initially thought to be due to acoustic neuroma. Five months after her initial presentation, a computerized tomography (CT) scan of the abdomen and

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Figure 1: 60LGHV UHSUHVHQWLQJ PHWDVVDWLF PDOLJQDQW FHOOV VLJQHW ULQJ FHOOV LQ FHUHEU

within the internal auditory canals bilaterally and cerebellar vermis. Oh et al. [6] performed the largest retrospective study that included 54 patients who had LMC due to metastatic gastric cancer. A lumbar puncture (LP) was performed, and the Cerebrospinal fluid (CSF) analysis showed evidence of elevated protein and positive for signet malignant cells (Figure 1). A multi-disciplinary team involving a medical oncologist, neurosurgeon and a radiation oncologist was formed. Intrathecal chemotherapy with liposomal Cytarabine and systemic chemotherapy with oral Capecitabine were initiated along with whole brain radiation and Ommaya reservoir placement. Unfortunately, her course was complicated by chemical meningitis and hydrocephalus requiring shunt placement and discontinuation of chemotherapy. This was followed by recurrent seizures and encephalopathy, which were attributed to the progression of LMC. At this time, patients' family opted for comfort measures and she deceased almost nine months after her initial presentation [6].

Discussion

LMC is defined as cancer cell invasion of the leptomeninges (pia mater and arachnoid membrane). It is a rare but devastating neurological complication of cancer that is associated with a poor prognosis [2,7]. Although originally considered to be a rare complication, it has become more commonly diagnosed as cancer patients live longer and diagnostic tools improve. It is estimated that LMC is diagnosed in 5-8% of patients with metastatic disease but it can be as high as 20% at autopsy [7-9]. Most LMC cases are reported in patients who have leukemia, breast cancer, lymphoma, lung cancer or melanoma [3]. In contrast, LMC in gastric cancer patients is extremely rare with a prevalence of only 0.14%-0.24% [4,6].

A majority of patients with LMC present with headache (39-85%) or nausea and vomiting (25-58%). Other symptoms may include leg weakness, altered mental status, hearing loss, seizures and diplopia [4,10]. These symptoms are usually attributed to meningeal irritation, increased intracranial pressure, cerebral edema, direct invasion of brain parenchyma or direct invasion of cranial or spinal nerve roots.

Diagnosis of LMC can be difficult. Diagnostic evaluation usually starts with a Gadolinium-enhanced MRI which would show leptomeningeal enhancement [11]. Confirmation of the diagnosis is usually required by performing a single or multiple lumbar punctures. Ideally, CSF analysis would show high opening pressure, high protein, low glucose and positive cytology for malignant tumor cells [3,12,13].

Conclusion

In conclusion, LMC may occur at any stage in the neoplastic disease, either as the presenting sign or as a late complication. The current case is unique not only because the patient presented at the ENT clinic with chief complaints of hearing impairment rather than neurological deficits such as headache, nausea, or seizure, but also because the initial MRI findings were suggestive of acoustic neuroma. Our case highlights the importance of the multidisciplinary cancer care, and calls for the development of new diagnostic tools and treatment regimens for LMC.

References

1. Al-Agha OM, Nicastrì AD (2006) An in-depth look at Krukenberg tumor: An overview. Arch Pathol Lab Med 130: 1725-1730.
2. Young RH (2006) From krukenberg to today: The ever present problems posed by metastatic tumors in the ovary: part I. Historical perspective, general principles, mucinous tumors including the krukenberg tumor. Adv Anat Pathol 13: 205-227.
3. Rubenstein JL (2005) Treatment of metastatic cancer. In: Devita JVT, Hellman S, Rosenberg SA, eds. Cancer: Principles and practice of oncology. 7th ed, USA, Lippincott Williams &Wilkins.
4. Pentheroudakis G, Pavlidis N (2005) Management of leptomeningeal malignancy. Expert Opin Pharmacother 6: 1115-1125.
5. Wasserstrom WR, Glass JP, Posner JB (1982) Diagnosis and treatment of leptomeningeal metastases from solid tumors: Experience with 90 patients. Cancer 49: 759-772.
6. Oh SY, Lee SJ, Lee J, Lee S, Kim SH, et al. (2009) Gastric leptomeningeal carcinomatosis: Multi-center retrospective analysis of 54 cases. World J Gastroenterol 15: 5086-5090.
7. Giglio P, Weinberg JS, Forman AD, Wolff R, Groves MD (2005) Neoplastic meningitis in patients with adenocarcinoma of the gastrointestinal tract. Cancer 103: 2355-2362.
8. Grossman SA, Krabak MJ (1999) Leptomeningeal carcinomatosis. Cancer Treat Rev 25: 103-119.
9. Shapiro WR, Posner JB, Ushio Y, Chemik NL, Young DF (1977) Treatment of meningeal neoplasms. Cancer Treat Rep 61: 733-743.
10. Posner JB, Chernik NL (1978) Intracranial metastases from systemic cancer. Adv Neurol 19: 579-592.
11. Clarke JL (2012) Leptomeningeal metastasis from systemic cancer. Continuum 18: 328-342.
12. Straathof CS, de Bruin HG, Dippel DW, Vecht CJ (1999) The diagnostic leptomeningeal metastasis. J Neurol 246: 810-814.
13. Groves MD (2011) Leptomeningeal disease. Neurosurg Clin N Am 22: 67-78.
14. Kim SJ, Kwon JT, Mun SK, Hong YH (2014) Leptomeningeal carcinomatosis of gastric cancer misdiagnosed as vestibular schwannoma. J Korean Neurosurg Soc 56: 51-54.
15. Kim DY, Lee KW, Yun T, Park SR, Jung JY, et al. (2003) Comparison of intrathecal chemotherapy for leptomeningeal carcinomatosis of a solid tumor: Methotrexate alone versus methotrexate in combination with cytosine arabinoside and hydrocortisone. Jpn J Clin Oncol 33: 608-612.
16. Chang EL, Maor MH (2003) Standard and novel radiotherapeutic approaches to neoplastic meningitis. Curr Oncol Rep 5: 24.
17. Cole BF, Glantz MJ, Jaeckle KA, Chamberlain MC, Mackowiak JI (2003) Quality-of-life-adjusted survival comparison of sustained-release cytosine arabinoside versus intrathecal methotrexate for treatment of solid tumor neoplastic meningitis. Cancer 97: 3053-3060.
18. Glantz MJ, Van Horn A, Fisher R, Chamberlain MC (2010) Route of neoplastic meningitis. Cancer 116: 1947-1952.
19. Bruno MK, Raizer J (2005) Leptomeningeal metastases from solid tumors (meningeal carcinomatosis). Cancer Treat Res 125: 31-52.
20. DeAngelis LM, Boutros D (2005) Leptomeningeal metastasis. Cancer Invest 23: 145-154.
21. Lee JL, Kang YK, Kim TW, Chang HM, Lee GW, et al. (2004) Leptomeningeal carcinomatosis in gastric cancer. J Neurooncol 66: 167-174.

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