Case Report

Free full text available from
www.cancerjournal.net

Synchronous anaplastic oligodendroglioma and carcinoma tongue: A rare association

ABSTRACT

We present the case of a 45-year-old female patient who harbored two synchronous primary malignant neoplasms—an anaplastic oligodendroglioma of the right frontal lobe and a squamous cell carcinoma of the tongue. Both neoplasms were in advanced stage and carried a dismal prognosis. To the best of our knowledge, this is the first documentation in the english literature of such a presentation. The purpose of this article is to alert clinicians to this possibility and to outline the management approach in a different manner in patients presenting with multiple primary neoplasms.

KEY WORDS: Multiple primary malignant neoplasms, oligodendroglioma, carcinoma tongue

Vikash Kumar, K Singh, Medha Tatke[1], A. K. Rathi, Shashank Shekhar, A. K. Bahadur

Department of Radiotherapy, Maulana Azad Medical College and [1]Department of Pathology, G B Pant Hospital, New Delhi, India.

For corresponence:
Dr Vikash Kumar, Department of Radiotherapy, Maulana Azad Medical College and Lok Nayak Hospital, New Delhi - 110 002, India.
E-mail: drvikashkr@gmail.com

DOI: 10.4103/0973-1482.65241

INTRODUCTION

Two or more abnormal growths of tissue occurring simultaneously and presumed to be of separate origin are known as multiple primary neoplasms. Histologically, they could be the same or different, and the neoplasms may be found in the same or different sites. These lesions are classified into two groups:[1] synchronous – in which both the lesions appear at the same time or within 2 months and[2] metachronous – where the malignancies develop in sequence (more than 2 months apart).[1] Treatment strategies in cases of double malignancy generally involve treating the malignancy that is more advanced first. Sometimes, both malignancies may be treated simultaneously, if the therapeutic option is the same for both. Metachronous primary malignancies are becoming increasingly more common because of the increase in the number of elderly patients and improvements in diagnostic techniques. However, synchronous primary malignancies are still unusual. Data regarding treatment and outcome in such cases is sparse. The prognosis of synchronous tumors is significantly poorer when compared to malignancies of a metachronous nature, although there are some encouraging individual results. Only early implementation of aggressive treatment methods for second primaries is successful in terms of improving survival.[2]

This case is being reported because of the extremely rare nature of the presentation. Awareness of this possibility is of utmost importance for formulating standard management.

CASE REPORT

A 45-year-old female presented in the neurosurgery outpatient department with history of right-sided headache and a single episode of generalized tonic–clonic seizure. On general physical examination she was afebrile, had mild pallor, and had a Karnofsky performance status of 90%. Central nervous system examination revealed normal higher mental functions, normal motor/sensory system, no neck rigidity, and all cranial nerves were intact. Magnetic resonance imaging of brain revealed a large ill-defined, irregular, diffusely infiltrating right frontal space-occupying lesion, with associated cystic component. The lesion showed extension up to the genu of the corpus callosum and the left frontal lobe, with perilesional edema extending up to the left parietal lobe [Figure 1]. The patient underwent right frontal craniotomy and gross total resection of the lesion. The postoperative period was uneventful and she was put on anticonvulsant prophylaxis. Histopathology of the postoperative specimen revealed anaplastic oligodendroglioma [Figure 2]. She was referred to our department for adjuvant radiotherapy (RT). After initial workup, the patient was planned for external beam radiotherapy as per department protocol. A total of 59.4 Gy was delivered to the gross disease in conventional fractionation by parallel opposed lateral portals by shrinking field technique using a telecobalt unit. After a few fractions of RT, the patient complained of pain in the left side of the tongue and referred pain in the left ear. CT scan of the head and neck region showed a heterogeneously enhancing soft tissue lesion involving most of the oral tongue, with extension to the base of the tongue and the

left tonsillar fossa [Figure 3]. There was associated level I and level II cervical lymphadenopathy, measuring 3.8 × 3.1 cm and 1.7 × 1.6 cm, respectively. She was advised biopsy from the ulcer and this revealed moderately differentiated squamous cell carcinoma [Figure 4]. After completion of RT to the brain, she was lost to follow-up. When contacted over the phone, she reported in the outpatient department with advanced disease tongue. Considering her present performance status and disease stage, she was put on palliative RT to tongue and neck nodes. At her last follow-up, she had no neurological deficit clinically and the tongue primary showed partial response.

DISCUSSION

In 1889, Billroth published the first report of multiple primary malignancies.[3] Moertel, in his study of 37,580 cases of malignant disease, reported multiple primary malignant tumors in 10.6% of autopsy cases and 4.6% of surgical cases.[4] Willis considered that the multicentric origin of malignant neoplasia was the result of carcinogenic stimulus on a common tissue with a common cancer predisposition or susceptibility, with neoplasia commencing initially where the stimulus was maximum and occuring secondarily in a different part of the same tissue at a later date.[5] Warren and Gates[6] proposed the following criteria for diagnosis of multiple primary malignancies:

- Each tumor must give a definite picture of malignancy
- Each must be distinct
- The probability that one was a metastatic lesion from the other must be excluded.

Lund[7] classified multiple malignancies as:

1. Multiple primary malignant neoplasms of multicentric origin

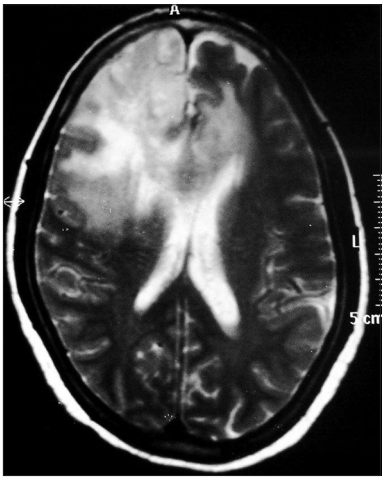

Figure 1: MRI showing a large, irregular, diffusely infiltrating right frontal space occupying lesion with associated cystic component and perilesional edema

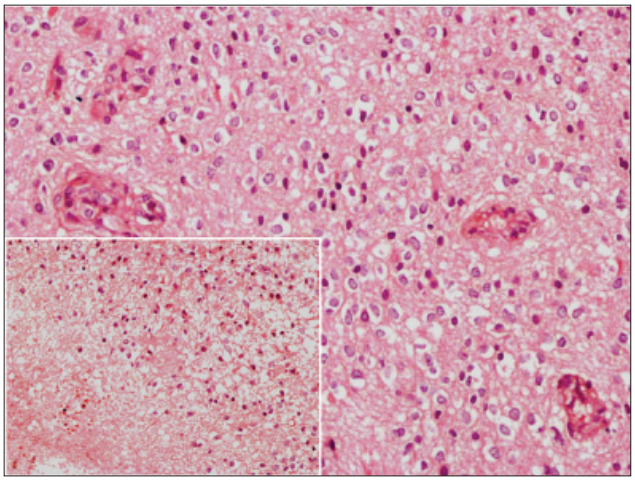

Figure 2: Tumor composed of oligodendrocytes showing pleomorphism, endothelial hyperplasia, and necrosis (inset) (H and E; ×160)

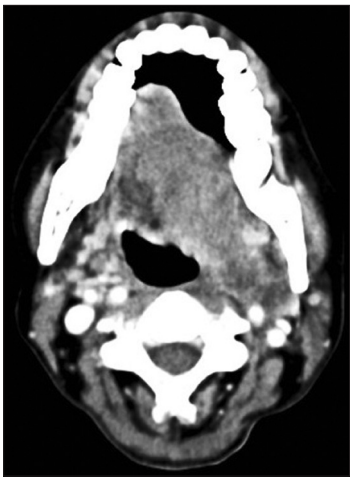

Figure 3: CT scans showing a heterogeneously enhancing soft tissue lesion involving most of the oral tongue, with extension to the left tonsillar fossa

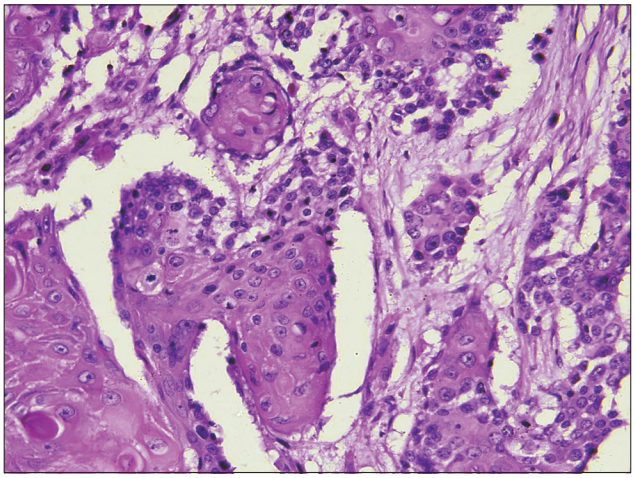

Figure 4: Malignant squamous cells infiltrating the fibrocollagenous tissue (H and E; ×400)

a. The same tissue and organ
b. A common, contiguous tissue shared by different organs
c. The same tissue in bilaterally paired organs

2. Multiple primary malignant neoplasms of different tissues or organs
3. Multiple primary malignant neoplasms of multicentric origin plus lesion(s) of different tissues or organs

There have been several case reports in literature. One case reported from Japan had synchronous adenocarcinoma of lung and malignant astrocytoma of brain.[8] Hirota *et al.* reported carcinoma tongue as a second malignancy 2 years after cessation of chemotherapy in a 15-year-old girl treated for osteosarcoma.[9] Malkin *et al.* investigated the possibility that p53 mutations in the germline are associated with second primary cancers that arise in children and young adults who would not be considered as belonging to Li-Fraumeni families.[10] Kohmura *et al.* found that the overexpression of cyclin D1 and p53 proteins was highly correlated with the development of multiple primary malignant neoplasms.[11] The *PIK3CA* gene is located on chromosome 3q26.32 and encodes for the catalytic subunit p110 alpha of class IA PI3K. Recently, high frequencies of somatic mutations in the *PIK3CA* gene have been reported in several human cancer types, including colon, head and neck, brain, stomach, breast, and ovary.[12]

With synchronous tumors, a mean survival time of 18 months and a 5-year survival rate of 11.9% have been found. Where clinically appropriate, an aggressive treatment strategy should be employed as this approach yields the most favorable results, with 5-year survival rates of 66.8% and 35.9% for index tumors and second primary malignancies, respectively.[2] Aggarwal *et al.*[13] reported two cases of synchronous double malignancies: one of carcinoma cervix with carcinoma breast and another of frontoparietal astrocytoma and carcinoma parotid. They concluded that synchronous double malignancy can be treated successfully.

CONCLUSION

Sophisticated genetic, histopathologic, epidemiologic, and statistical approaches need to be used to improve our knowledge of the rate and patterns of occurrence of multiple cancers. Education of the patients, awareness of the clinicians, regular examinations of patients, and the use of screening procedures are important steps for the prophylaxis of multiple primary tumors and may lead to a better outcome for the individual patient. In our patient, the prognosis of both tumors was poor and early implementation of aggressive treatment could have improved the results and contributed to better quality of life. When a metachronous tumor is found after treatment of the first, the clinician should not assume that the latter is a metastasis but, rather, should explore the possibility of it being a second, potentially curable, primary. It is imperative, therefore that the cancer patient should be under continuous surveillance till the end of life even if he/she is apparently 'cured.'

REFERENCES

1. Howe HL. A review of the definition for multiple primary cancers in the United States. Workshop Proceedings from December 4-6, 2002, in Princeton. North American Association of Central Cancer Registries: New Jersey, Springfield (IL); May 2003.
2. Di Martino E, Sellhaus B, Hausmann R, Minkenberg R, Lohmann M, Esthofen MW. Survival in second primary malignancies of patients with head and neck cancer. J Laryngol Otol 2002;116:831-8.
3. Billroth T. Die allgemeine chirurgische pathologie und therapie. Reimer G. ed, 14 Aufl. Berlin;1889. p. 908.
4. Moertel CG. Multiple primary malignant neoplasms historical perspectives. Cancer 1977;40:1786-92.
5. Willis RA. Mode of origin of tumors; solitary localized squamous cell growths of skin. Cancer Res 1944;4:630-44.
6. Warren S, Gates O. Multiple primary malignant tumors: a survey of the literature and a statistical study. Am J Cancer 1932;16:1358-414.
7. Lund CC. Second primary cancer in cases of cancer of buccal mucosa; mathematical study of susceptibility to cancer. N Eng J Med 1933;209:1144-52.
8. Kishimoto T, Hashimoto H, Ono T, Okada K. Synchronous double malignancy: Adenocarcinoma of lung and malignant astrocytoma induced by asbestos exposure. Cancer Invest 1992;10:129-33.
9. Hirota T, Sawada K, Sakakibara Y, Fujimoto T, Yokoi T, Hara K. Squamous cell carcinoma of the tongue as a second malignancy in a patient previously treated for osteosarcoma. Pediatr Hematol Oncol 2000;17:421-4.
10. Malkin D, Jolly KW, Barbier N, Look AT, Friend SH, Gebhardt MC, *et al.* Germline mutations of the p53 tumor-suppressor gene in children and young adults with second malignant neoplasms. N Engl J Med 1992;326:1309-15.
11. Kohmura T, Hasegawa Y, Ogawa T, Matsuura H, Takahashi M, Yanagita N, *et al.* Cyclin D1 and p53 overexpression predicts multiple primary malignant neoplasms of the hypopharynx and esophagus. Arch Otolaryngol Head Neck Surg 1999;125:1351-4.
12. Broderick DK, Di C, Parrett TJ, Samuels YR, Cummins JM, McLendon RE, *et al.* Mutations of PIK3CA in anaplastic oligodendrogliomas, high-grade astrocytomas, and medulloblastomas. Cancer Res 2004;64:5048-50.
13. Agrawal R. Synchronous dual malignancy: Successfully treated cases. J Cancer Res Ther 2007;3:153-6.

Source of Support: Nil, **Conflict of Interest:** None declared.