

# Brain Metastases Secondary to Advanced Laryngeal Cancer Presenting as Diminution of Vision and Lower Limb Weakness

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## ABSTRACT

**Objective:** Intracranial metastases from primary laryngeal carcinoma are extremely rare and to present as diminution of vision has not been reported in published English literature. We present a case of advanced laryngeal carcinoma, who after treatment with surgery and chemo radiation, presented with decreased vision and weakness of lower limbs secondary to brain metastases.

**Case report:** A 35-year-old male presented with dysphonia and L upper neck swelling. Endoscopy revealed a left supraglottic mass with fixed vocal cord and pathology of primary site and neck swelling reported it as moderately differentiated squamous cell carcinoma. Clinical and radiological assessment staged the tumor as T3N2bM0. Patient underwent combined standard surgical and medical treatment. Eight months after completion of treatment patient presented as decreased visual acuity (R > L) and gradually progressing weakness of lower limbs. Evidence of papilloedema on fundus exam prompted an urgent CT brain which showed multiple metastatic deposits in brain. There was no evidence of metastases in lungs, bones or liver.

**Conclusion:** Brain metastases are a known entity in Head and Neck cancer. Larynx as a primary site for the same should be kept in consideration with an atypical presentation as in present case.

**Keywords:** Brain metastases, Primary laryngeal cancer, CT scan, Distant metastases, Head and neck cancer.

## INTRODUCTION

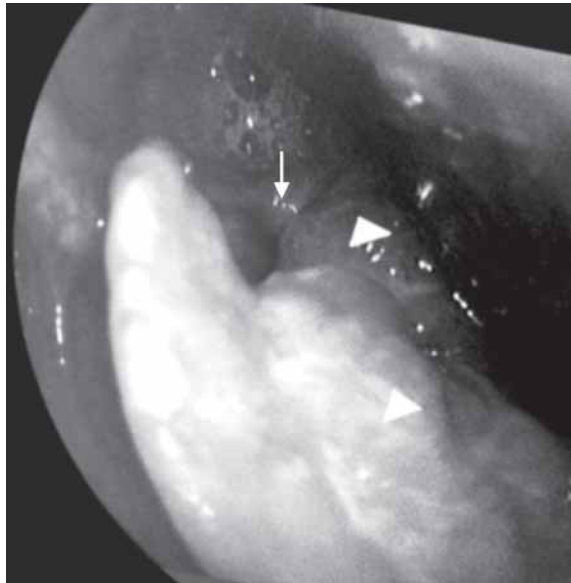
Incidence of distant metastases in head and neck squamous cell carcinoma varies in different series with majority suggesting a figure that varies from 4 to 25%.<sup>1,2</sup> Distant metastases from primary laryngeal squamous cell carcinoma is an established condition detected in about 6.5 to 7.2% of patients.<sup>3</sup> The most common sites of affliction are lung, bone, liver, mediastinum and bone marrow while as skin and muscle have been reported to develop such metastases.<sup>3-6</sup> Intracranial metastatic deposits from squamous cell carcinoma of the larynx is exceedingly rare and usually is detected after development of pulmonary metastases.<sup>7-9</sup> The site of metastatic disease primarily determines the presentation, which in case of brain is usually a seizure disorder. The purpose of this report is to highlight the unique presentation of multiple brain metastases with diminution of vision and weakness of lower limbs in a patient with advanced cancer of larynx having no evidence of any other distant metastases.

## CASE REPORT

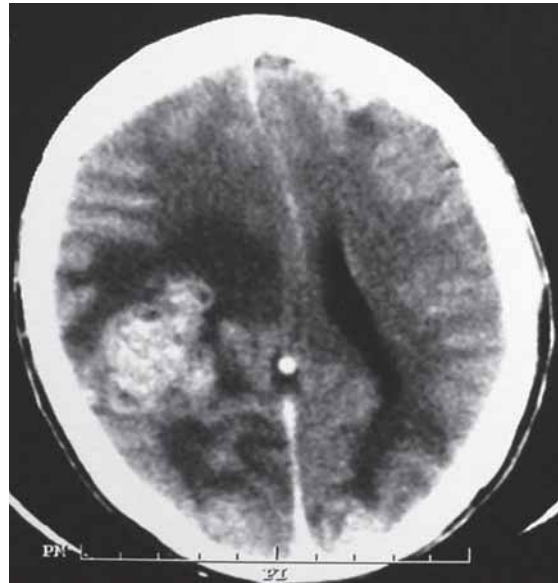
A 35-year-old cigarette smoker, nonalcoholic reported with progressive dysphonia of 1 year duration and subsequent

development of increasing swelling in the neck just below angle of mandible on left side that was initially noticed 6 months back. Clinical evaluation and subsequent endoscopic examination revealed an irregular surfaced growth on left side of larynx involving AE fold, laryngeal surface of epiglottis, arytenoid and vocal cord with its fixity (Fig. 1). Two discrete, firm, smooth surfaced swellings with restricted vertical mobility and normal overlying skin were palpable along left anterior sternomastoid, upper one (level II) being larger. Patient had no significant past medical or surgical history. Biopsy of the mass and aspiration cytology of the neck swelling revealed moderately differentiated squamous cell carcinoma on histopathology. Involvement of left paraglottic space, medial pyriform fossa and infiltration of thyroid cartilage lamina internally only, were the main findings on a contrast enhanced CT of neck. Three neck nodes were identified ipsilaterally none more than 3 cm in greatest dimension, belonging to Level II, III and IV. Clinical radiological and biochemical studies failed to reveal any distant metastatic spread and hence the tumor was staged as T3N2bM0.

A total laryngectomy with radical neck dissection on the left side and selective dissection contralaterally was carried out. Histopathology identified deposits in ipsilateral



**Fig. 1:** Laryngeal tumor (triangles) and R arytenoid (arrow)—telelaryngoscopic view



**Fig. 3:** Cerebral metastasis in R parietal region



**Fig. 2:** Patient after completion of chemoradiotherapy



**Fig. 4:** Metastases in occipital and parietal region with obliteration of R lateral ventricle

level II, III and IV nodes while contralateral nodes were negative. Patient underwent combined chemoradiotherapy and did follow up as advised (Fig. 2). After 8 months of completion of treatment he complained of decreased visual acuity, more in R eye and gradually progressing weakness of lower limbs. Bilateral papilloedema and grade III power of lower limbs with reduced muscle mass were evident. Brain imaging showed multiple enhancing lesions especially in occipital and R temporoparietal regions with significant distortion of ventricular system (Figs 3 and 4). A thorough search for metastases in other organs failed to give any positive results. Treatment was started with palliative intent but the patient had a rapid worsening of health till his death 4 months after detection of distant metastases.

## DISCUSSION

The development of metastases in a patient is a discouraging sign both for the patient and the physician as the overall prognosis is dismal. Head and neck cancer patients presenting with advanced local disease and regional lymphnode involvement are at a higher risk of developing distant metastases.<sup>7</sup> Primary sites for the lodgment of metastases are lungs, bones and liver while as other tissues infrequently serve as a host for the same. As compared to other head and neck sites glottic/supraglottic laryngeal carcinoma has lesser rate of distant metastases (DM).<sup>3</sup>

Areas within the cranium do represent sites for DM of laryngeal origin but develop subsequent to pulmonary

metastases.<sup>7</sup> While as there are reports of cavernous sinus involvement by metastases originating from different head and neck sites,<sup>8,10</sup> isolated brain metastases from primary laryngeal carcinoma is very rare and presents as seizures.<sup>9</sup> To present as visual acuity reduction and weakness of extremities is not known for DM originating from the larynx.

Screening for DM in case of head and neck carcinoma is not well established. Role of plain chest radiography, alkaline phosphatase levels, liver function tests as screening tests have been seriously questioned. Accordingly, the authors recommend CT scan of thorax if chest radiograph is abnormal, bone scan if alkaline phosphatase is elevated and USG/CT/MRI of liver, if liver function tests are deranged.<sup>11</sup> For the detection of intracranial metastases in case of a seizure disorder or a neurological deficit in a patient of known head and neck carcinoma, CT is initial choice because of its cost effectiveness but MRI is the next option if there is any doubt about the number and characteristics of the metastatic lesion and to differentiate it from other intracranial pathologies.<sup>12</sup> Multiple enhancing lesions at gray-white matter interface with surrounding edema on a contrast enhanced CT scan, in a patient with known primary cancer, a diagnosis of metastatic brain disease can be reliably made.

Treatment options after the detection of metastatic brain disease are very limited, mainly focusing on palliative intent and range from surgery to radiotherapy and chemotherapy. Isolated brain metastases may respond to surgery but in presence multiple lesions chemo and radiotherapy are frequently utilized for palliation.

The outlook for patients with intracranial metastases is poor with 75 to 85% mortality within 2 years.<sup>10</sup> A median survival of 4.3 months was noted for intracranial metastases in patients of head and neck cancer. However, absence of extracranial disease, age younger than 60 years and treatment

with radiotherapy, were the prime factors associated with longer survival.<sup>8</sup>

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## Editorial Inputs

### Brain Metastases in Head and Neck Cancers

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#### INCIDENCE

Brain Metastases from Head and Neck Cancers are uncommon and probably under-reported. Head and Neck Squamous Cell Carcinomas (HNSCC) brain metastasis

comprise 2 to 6 percent of all patients with metastasis. Though in general, solitary metastasis is more common than multiple foci, in brain solitary brain metastasis is very rare. A higher incidence is seen in tumors reaching the skull base which

may be because of contiguous spread as well as perineural and/or perivascular infiltration. Histology probably plays an important role dictating the biological behavior of the tumor thereby influencing the incidence of intracranial spread. Primary cancers commonly associated with brain metastasis include undifferentiated nasopharyngeal cancer and adenoid cystic carcinoma.

## INVESTIGATIONS

The diagnosis is usually established radiologically and MRI would be the imaging of choice for intracranial metastases. Gadolinium enhanced MRI with diffusion and MR spectroscopy can often accurately diagnose brain metastases the differentials being abscess, granulomas and primary brain tumors. It is important to rule out other distant metastasis and confirm locoregional control of disease. Towards this PET-CT, when available is a single modality which will help rule out locoregional disease and presence of other metastases. When not available regional CT scans of the head, neck and thorax along with a bone scan are imaging modalities to diagnose distant metastasis which usually occur in the lung, bone or liver in that order of frequency.

## MANAGEMENT

Histological proof is often not necessary. Stereotactic biopsy can provide tissue diagnosis when mandatory. Medical management includes steroids and antiepileptics (if symptomatic, or prophylactically given perioperatively). Definitive management depends on the symptoms:

### A. Symptomatic intracranial mets:

#### 1. Solitary metastasis

- Surgery remains the mainstay for accessible lesions in patients with good Karnofsky Performance Status (KPS), providing not only symptomatic relief but also prolonging survival when combined with postoperative whole brain radiotherapy WBRT.
- Stereotactic radiosurgery (SRS) (along with WBRT) may provide equivalent benefit for small (<3cm) lesions or oligometastases with negligible mass effect. Few conflicting reports also suggest equivalent control with SRS alone. However frequent surveillance and salvage SRs should be available.
- Radiotherapy (RT) may be the preferred modality for radiosensitive tumors (germ cell, lymphoma, neuroendocrine)
- RT is also preferred in patients with poor KPS and/or uncontrolled locoregional disease OR when the lesion is inaccessible surgically.

#### 2. Multiple metastases

- Usually managed by palliative WBRT alone.

- Surgery very rarely offered for a very large symptomatic lesion provided patient is in good KPS.
- B. Asymptomatic metastases  
Individualized decision (surgery vs RT).

## ROLE OF CHEMOTHERAPY

The most active agents in metastatic head and neck cancer are platinum agents, taxanes, 5-fluorouracil and cetuximab.<sup>1-6</sup> However, their brain penetration has been found to be limited. Etoposide and methotrexate which have good CNS penetration have modest activity in recurrent and metastatic head and neck cancer and they may be tried in such settings. Temozolamide especially with concurrent whole brain irradiation has shown extremely promising results in brain metastasis and this definitely gives hope in such condition.<sup>7,8</sup>

The main modality of treatment in head and neck cancer with brain metastasis remains whole brain irradiation and/or surgery but chemotherapy may be tried in refractory cases or where radiation can not be given.<sup>9-12</sup>

## OUTCOMES

Usually the prognosis is poor with survival ranging from 4-6 months.

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