

Advanced Lung Cancer with Superior Vena Cava Syndrome and brain metastasis- Long term survivorship

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Abstract: Lung cancer has been one of the deadliest cancers and majority of the cases present in advanced stages. Moreover, brain metastases and superior vena cava syndrome (SVCS) in lung cancer patients further have been coupled with dismal prognosis and short overall survival. Such patients presenting in fourth stage of cancer have been considered usually incurable and considered for palliative treatment or sometimes Best Supportive Care. **Case Report-** We present a case of carcinoma lung with SVCS, who later on developed brain metastasis in the course of treatment. He has been successfully treated with radiation therapy to lung lesion with concurrent chemotherapy followed by adjuvant chemotherapy. He also received External Beam Radiation for brain metastasis. He is disease free after 7 years of treatment completion and on regular follow-up till date. **Conclusion-** This case is being reported in view of long term survivorship of a locally advanced and metastatic lung cancer patient with a poor prognosis and to accentuate the fact that selected subsets of patients, with metastatic disease, can be treated with aggressive protocols to ensure long term disease control

Key Words: Lung cancer, Superior Vena Cava Syndrome, Brain metastasis, Whole Brain Radiotherapy

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Introduction: Lung cancer has been the most common cancer in the world for past few decades. There were estimated 1.8 million new cases in 2012 (12.9% of the total). It is the most common cause of cancer related deaths worldwide and overall ratio of mortality to incidence is 0.87 ^[1]. Lung cancer spreads by direct extension, to regional lymph nodes or to distant sites via hematogenous route. Contralateral lung, liver, bone, adrenals and brain are the most frequent sites of distant spread. Also, it is the most common cancer which spreads to brain and such patients have a poor prognosis, with median survival typically measured in months ^[2]. Another important complication associated with lung cancer is Superior Vena Cava Syndrome (SVCS), which is a medical emergency. Patients with SVCS also have a poor prognosis, with only 10-20% surviving for more than 2 years ^[3]. We are presenting a case of carcinoma lung, who presented with clinical features of SVCS and later developed brain metastases. He had been successfully treated and is disease free for more than seven years after the initial presentation.

Case Report: A 55 years old gentleman, with non diabetic, non hypertensive and euthyroid status, presented with complaints of breathlessness, cough and hemoptysis. On examination, he had tachypnea, tachycardia, difficulty in lying down, facial edema and prominent veins over neck and chest wall. Contrast Enhanced Computed Tomography (CECT) of Thorax reported a large necrotic lymph nodal mass in right supraclavicular, pre & paratracheal and right hilar

region, causing marked extrinsic compression alongwith intraluminal extension of mass into trachea and invasion of SVC and right Internal Jugular Vein was noted (Fig 1). A clinical and radiological diagnosis of SVCS was made. After discussion with Pulmonologist and Radiologist, it was concluded that neither bronchoscopic nor CT guided biopsy was feasible due to patient's poor general condition. Hence, after taking fully informed consent of the patient, he was planned for External Beam Radiotherapy (40Gy/20fr). After receiving 32Gy/16fr, he reported marked relief in the symptoms. At that time, bronchoscopic guided biopsy was taken which reported squamous cell carcinoma. In view of good clinical response, he was planned for radical radiation with concurrent chemotherapy. He received a dose of 62Gy/31fr along with weekly concurrent Cisplatin, following which he received 6 cycles of Gemcitabine and Carboplatin based chemotherapy. The disease was in clinical remission and patient was on regular follow up after that. Three years later, he developed instability during walking. CEMRI Brain reported ovoid enhancing lesion in right frontal region suggestive of metastasis (Fig 2). Neurosuregry opinion was taken but the patient refused for any surgical intervention. He was immediately planned for Whole Brain Radiation (30Gy/10fr) and simultaneous boost to gross disease (36Gy/10fr). He further received 6 cycles of Gemcitabine and Cisplatin based chemotherapy following which he was again kept on follow-up. After seven years, the patient is asymptomatic and neurological examination is perfectly within normal

limits. CECT Thorax and CEMRI Brain do not reveal any abnormality (Fig 3&4).

Discussion: Globally, lung cancer is the largest contributor to new cancer diagnosis as well as to cancer related deaths. Lung cancer is the most common cancer that spreads to brain, accounting for approximately half of all brain metastases [4]. Such patients have a poor prognosis and overall median survival has been documented to be in months, even after taking treatment [5]. Patient presents with headache, behavioral symptoms, focal weakness, seizures etc. MRI is the standard of care for imaging of brain [6]. Treatment includes symptomatic management (corticosteroids) as well as management of brain metastases which include surgery, irradiation and chemotherapy. Historically, Whole Brain Radiation Therapy (WBRT) played a significant role in management of brain metastases. However, it has been criticized due to possibility of neurocognitive disorders in long-term survivors [7]. For solitary or oligometastatic disease and controlled primary, a radical treatment approach involving surgery or radiosurgery followed by WBRT is recommended. WBRT still remains the treatment of choice in case of multiple metastases, lesions in surgically inaccessible areas or patients otherwise unfit for surgery. Response rates may vary depending on the primary tumor type and complete and partial response rates are seen in more than 60% of the patients in randomized control studies by RTOG [8]. The median survival of patients with untreated brain metastases is 3 months, which may be increased to 7-13 months in selected cases by the use of surgery, SBRT and WBRT [9]. Various series have reported that long term survivors are rare. 5-13% of the patients live for 2 years and 2-2.5% for 5 years [10]. A dose of 30Gy/10fr continues to be the standard schedule. However, recurrence is quiet common and control of brain metastases may only be achieved in half of the patients.

Superior Vena Cava Syndrome (SVCS) is another complication seen in lung cancer and is considered a medical emergency [11]. SVCS is usually caused by extrinsic or intrinsic compression of SVC. Patient presents with fullness in head, facial swelling and breathlessness and characteristic signs elicited are venous distension of neck and chest wall, facial edema, plethora and cyanosis. Lung cancer is the underlying pathology in 70% of the patients of SVCS, other causes being lymphoma, thymoma, Germ Cell Tumor, Breast Cancer and other non malignant causes like central

venous catheters and pacemakers. Imaging studies like Chest X Ray or CT scan of the chest aid in identification of the mass and tissue biopsy is essential in making the histopathological diagnosis. However, in full blown SVCS and severe respiratory distress, emergency therapy should be initiated and can be performed without tissue diagnosis. Management includes general measures for symptomatic relief and definitive treatment of the underlying cause. General measures include sitting position, O2 inhalation, systemic steroids and diuretics [12]. The standard of treatment for SVCS with underlying malignancy remains radiation therapy to relieve the obstruction by debulking the tumor and improving the symptoms. Patients initially should be treated with high dose per fraction followed by additional daily doses of 1.8-2 Gy to complete definitive course of Radiation [13]. Recommended total tumor dose in localized bronchogenic cancer is 60-70 Gy in 6-7 weeks. Symptomatic relief has been observed in majority of patients, with excellent relief in 20%, good response in 50%, minimal response in 15% and no response in 15% [14]. Armstrong et al reported survival rates of 25% at 1 year and 10% at 3 years in a series of 84 patients. Patients having symptomatic relief within 30 days had a significantly better survival rate [15]. Other treatment options are chemotherapy and endovascular stenting. Our patient presented with signs and symptoms of SVCS and his treatment was started without a biopsy keeping in view the patient's symptoms. He received a radical dose of radiation and chemotherapy. Later on, during the course of disease, he developed brain metastasis, which was also successfully treated with WBRT and boost dose to tumor. He tolerated the treatment well and is disease free after 7 years of follow-up.

Conclusion: This case is being reported to emphasize the fact that all stage IV patients do not have a dismal prognosis. They should be methodically investigated and multimodality approach should be offered to selected patients, as there are reasonable chances of such patients to have complete cure of the disease.

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