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Case report

Adaptive radiotherapy in a case of adenoid cystic carcinoma of bronchus and its favourable impact on treatment outcome: A case report

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ABSTRACT

Adenoid cystic carcinoma is a very rare malignancy commonly originating from the salivary glands of the head and neck. It is again very scantily seen in sites like the bronchus. Surgical resection is the mainstay of treatment but many a times the tumour site and size preclude a favourable outcome of surgery and the patient is advised for other forms of local treatment like Radiotherapy. Here, we present a case report of a young female with primary adenoid cystic carcinoma of the bronchus. The tumour was located in the carina and the left bronchus which was obstructing the airway resulting in collapse of the left lung, this resulted in shifting the mediastinum and abdominal structures in to the thorax. The tumour was inoperable and was advised for radiotherapy. The adenoid cystic carcinoma of the bronchus with such presentation and mediastinal shift is a rare and special situation. During radiotherapy the collapsed lung was inflated which resulted in the shifting of the tumour and other normal structures. The use of adaptive radiotherapy in such situation helped us to achieve improved dose delivery to the tumour and this resulted in an improved survival for the patient as compared to the available literature.

1. Introduction

Adenoid cystic carcinoma (ACC) frequently originates from the salivary gland of the head and neck, it is also seen in the breast, skin, upper aero-digestive tract and lungs.[1,2] ACC arising from bronchial glands accounts for 0.04 to 0.2% of all primary lung cancers.[3] ACC of the lung commonly arises in the trachea and bronchus presenting with hemoptysis and dyspnoea. Due to its rarity, there is not much literature on the presentation and management but with the available evidence complete surgical excision remains the standard of care.[4] In the largest series of tracheal tumours only 70% were resectable at presentation and owing to its radio-sensitivity in ACC histology, the role of adjuvant radiotherapy is imperative with nearly 70% patients needing it due to high risk features.[5] In patients who present with inoperable disease, radical radiotherapy remains the treatment of choice with local control varying between 20 and 70%.[6]

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2. Case report

A 32-year-old lady presented with shortness of breath and cough of one-month duration with symptoms increasing frequently since last week. There was no history of chest pain or fever. She did not have any other significant medical history. The respiratory system examination revealed dull percussion note and absence of breath sound in the left lung. There was no lymphadenopathy in the neck or supra-clavicular fossa. The X Ray chest revealed a complete opacity of the left lung with mediastinal shifting to the left. Fibre-optic bronchoscopy showed a glistening pinkish growth causing complete obstruction of the left main bronchus The functional imaging with fluoro-deoxyglucose (FDG) positron emission tomography (PET) revealed a mass sized 6.7 cm × 3 cm × 5 cm encasing the left main bronchus and causing a complete collapse of the left lung. The histopathology was reported as adenoid cystic carcinoma of the Bronchus. The case was discussed at the multidisciplinary tumour board. In view of the location and extent of the tumour, surgery would lead to very high morbidity and poor quality of life; therefore, the patient was advised for radiotherapy.

She was immobilised and a planning contrast enhanced computed tomography (CECT) was done in an appropriate position. The previous FDG PET was registered with present planning CECT scan and the gross tumour volume (GTV) was contoured. Appropriate margin was given to delineate clinical target volume (CTV) and planning target volume (PTV). The radiation was planned on Eclipse 10.0 planning system using volumetric modulated arc therapy (VMAT) Radiotherapy technique. After necessary quality assurance, she was taken for radiotherapy. In order to have better accuracy, we did KV X-ray imaging daily followed by cone beam computed tomography (CBCT) before treatment. As anticipated, after one week of treatment we noticed the left lung opacity was reduced on X-ray. The CBCT showed that the left lung was inflated completely. This event led to the shifting of the mediastinum medially which resulted in the shifting of PTV and also normal structures with respect to planning CT scan.

We then repeated planning CECT of the thorax and did replanning. During the procedure, we noticed the GTV had shifted around 1.01 cm medially (Fig. 1) and the normal structures like the lung, heart, etc. had also shifted with respect to the planning CT scan. She was treated up to a dose of 6600 cGy to the tumour in 33 fractions @200 cGy per fraction without any interruption.

The patient had a disease free interval of 38 months after which she had a local relapse in the bronchus and also had ipsilateral lung nodules. She was advised for lobectomy but in view of morbidity the patient preferred palliative care. She was treated with palliative stent and she is surviving with a good quality of life (48 months) while writing this paper.

3. Discussion

Primary adenoid cystic carcinoma (ACC) of the lung is a very rare malignant neoplasm and there is very limited literature regarding clinical manifestation and management. ACC lung is more frequently seen in younger individuals with male preponderance.[7] Patients commonly present with dyspnoea and hemoptysis. Surgery is considered to be the most favourable treatment with good loco-regional control, there are some reports with good radio sensitivity for ACC.[8,9] Hu et al. presented a series of 34 patients. Those who were operable at presentation had good results: 92.9% survival at 3 years, 91.7% survival at 5 years, but those who were inoperable had only 50% survival at 3 years and 0% at 5 years with a median survival of only 23 months.[4]

Our patient is a young female presented with a collapsed lung with ACC of the Bronchus. There is no literature with such presentation in ACC of the lung. Her disease was inoperable and was treated with radiotherapy. We did adaptive radiotherapy planning for the patient on noticing a shift in the mediastinum after a few fractions of radiotherapy. The judicious use of adaptive radiotherapy helped us to deliver maximum dose to the tumour while protecting the normal structures. This contributed to a better outcome in terms of survival of the patient in comparison to previous literature.[4]

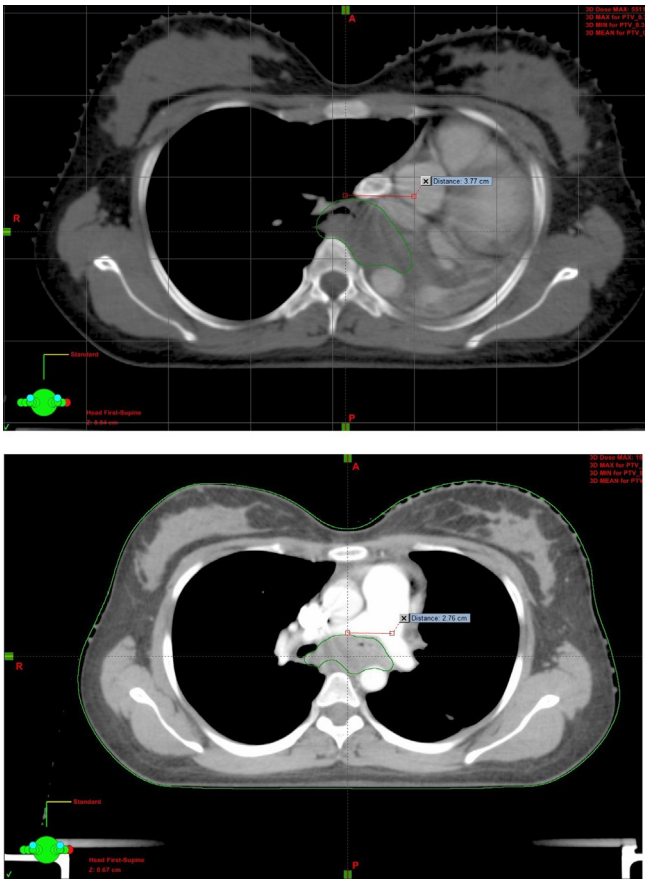

Fig. 1 – Axial section of CT scan showing shifting of GTV medially in comparison to pre treatment CT scan at corresponding level.

Conflict of interest

None declared.

Financial disclosure

None declared.

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