Demonstration of a primary malignancy bronchogenic carcinoma on a posterior anterior chest radiograph

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Abstract
Bronchogenic carcinoma is a highly malignant primary lung cancer, tumor, arising from the epithelial tissue of the bronchial tree. The disease is usually attributed to smoking. The disease is usually found in persons older than 50 years . This case report of a 32 year old young male includes his clinical history, role of imaging and the management, epidemiology as well as prognosis of this disease.

Keywords
smoking, chemotherapy

Case report

A 32 year old male presented to the emergency unit of a day hospital, with pain radiating from the left side of his chest. The pain involved, and revolved around his left shoulder and anterior chest. He reported weight loss over the last three months with night sweats and coughing but no history of previous tuberculosis. A chest radiograph was requested as his signs and symptoms pointed to a bacterial infection. Preliminary diagnosis included tuberculosis or other viral or bacterial infections.

The chest radiograph demonstrated a well defined large mass in the anterior aspect of the left upper chest with a raised hemi-diaphragm. The raised left hemi diaphragm was suggestive of phrenic nerve paralysis. A band of opacification in the left lower lobe was suggestive of left lower lobe sub-segmental atelactasis. The main bronchi appeared patent. A lateral projection was not performed. The initial diagnosis was reported as bronchogenic carcinoma but had to be confirmed clinically (Figure 1). After the initial findings the patient was sent to a tertiary hospital for further management.

Discussion

Bronchogenic carcinoma is a malignant cancer of the lung that invades and destroys part of the bronchial tree and adjacent structures [1]. It arises from the epithelial tissue of the bronchial tree [2-5]. Causes range from smoking or exposure to potent gas emissions and the incidence of cigarette smoking is > 90% for men and > 80% of cases in women. Occupational agents include asbestos, radiation, arsenic, chromates, nickel, chloromethyl ethers and mustard gas as well as exposure to radon gas [6-7]. The disease invades and destroys part of the bronchial tree and adjacent structures. It can also metastasise to other areas of the body. It is the most common tumor in men and the one associated with the highest mortality rate [1]. Early detection depends on early patient presentation of signs and symptoms. The carcinoma tends to form an intraluminal mass which may partially or completely obstruct the bronchus [5]. One or both of the main bronchi can be partially or completely obstructed by the tumor [7]. A tumor may extend directly into the esophagus, producing obstruction, sometimes complicated by a fistula. Phrenic nerve invasion usually
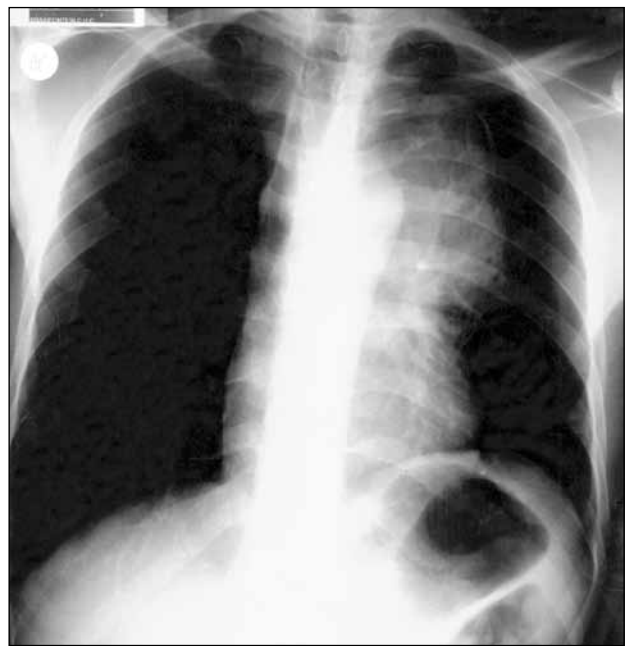

Figure 1: X-ray showing bronchogenic carcinoma

causes diaphragmatic paralysis [5]. This type of cancer accounts for 90% of all lung tumors in men as well as being the second most common cancer in men and women. It is the leading cause of cancer death among men (32%) [6]. As a result of metastasis the effects are irreversible. Brain metastasis occurs in approximately 20-40% of patients with lung cancer and is among the commonest cancers that metastasise to the brain [8]. It is important to identify cancer of the lung before it has migrated to other areas in order to monitor potential complications. However this is not always possible as patients present to the hospital when the cancer has already started breaking down their systems. Bronchogenic carcinoma usually affects the age group above 50 years. It is therefore not common for this cancer to manifest in a young individual as shown on this case report. There could be a range of reasons for the manifestation of the

bronchogenic carcinoma at an early age: these include an increase in the smoking habit of the individual and also exposure to other carcinogens. Bronchogenic carcinoma has a poor prognosis; the survival rate is about 10 to 35% in tumors that are resectable, but with an overall survival of 5 years [6].

Conventional chest radiography is the primary imaging modality used in diagnosing bronchogenic carcinoma. By the time the disease is demonstrated on a chest radiograph it has already increased in size, and in some cases it has already metastasized [6] to other areas of the body. Further clinical and imaging investigations are conducted for confirmation and preparation for treatment. Imaging modalities include computed tomography since its high specificity and sensitivity can detect the cancer in its early stages thus allow for the best option, in terms of treatment, to be identified early. Computed tomography is not available in all health facilities , such as the one visited by the patient in this case report. In these instances the patient is usually referred to a facility that has the necessary imaging equipment; this sometimes delays treatment as the referral system has to be followed and in some places there are long waiting lists.

Surgery with radiation therapy is the most utilized form of intervention to prevent local spread. Resection should be performed in the absence of contraindications, namely, evidence of spread beyond the lung , bronchial location of tumor too close to the trachea, and other serious conditions, for example coronary artery disease or inadequate lung function caused chronic obstructive pulmonary disease (COPD) [6].Chemotherapy with multiple drugs, particularly cisplatin and topoisomerase inhibitors, with or without radiation therapy, has yielded higher survival rates compared to surgery in patients with small cell carcinoma but cures are rare [6].

Conclusion

Diagnostic imaging plays an integral role in the diagnoses, staging, and follow up of patients with lung cancer. Most lung tumors are detected on chest radiographs; the majority of patients have advanced stage disease at presentation [9]. The nature, the morphology and the origins of the disease can be determined using various imaging modalities. Treatment options available depend on early detection, as well as the extent of the cancer. It is important for imaging personnel to be well versed and to keep abreast with technological advances if early diagnoses of diseases through imaging is to be made.

References

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Answers to CPD questions of the April 2010 issue:

Question 1 d	Question 11 b
Question 2 c	Question 12 c
Question 3 c	Question 13 c
Question 4 b	Question 14 a
Question 5 d	Question 15 c
Question 6 c	Question 16 a
Question 7 d	Question 17 a
Question 8 d	Question 18 d
Question 9 d	Question 19 b
Question 10 d	Question 20 a