Chest Tumours Other than Lymphoma

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12.1 Introduction

Thoracic tumours are generally arbitrarily classified, despite some inevitable overlap, as originating in three major compartments within the chest, namely the lung parenchyma, the mediastinum, and the chest wall. In the interests of simplicity and convention, that anatomical approach will be used in this chapter with an additional brief reference to diaphragmatic tumours. As most of the mediastinal tumours mentioned, other than the lymphatic malformations, have varying degrees of malignancy depending on the exact histological sub-type, that section has not been divided into benign and malignant categories. Benign chest wall tumours are described in Chapter 14 and will not be mentioned here. The imaging at diagnosis for all lesions has been emphasised throughout. The subsequent follow-up radiology of benign conditions is governed by the clinical course, and that of malignant masses is largely determined thereafter by imaging protocols devised by the various international paediatric oncology co-operative groups and should take place in specialist paediatric centres. PET/CT may be occasionally useful in the diagnostic work-up of some of the tumours mentioned in this chapter – the emerging role of PET/CT will be dealt with in more detail elsewhere in Chapter 2.

12.2 Clinical Features

Numerically, most tumours occurring in the thorax in childhood, particularly those encountered in paediatric oncology centers, are pulmonary metastases. These will usually be found during staging...
of a known or new malignancy and the dominant clinical findings will be those of the primary lesion. Primary thoracic neoplasia is uncommon in childhood and seldom an early diagnostic consideration, but a wide variety of tumours within the chest do occur and ideally should be recognised and imaged appropriately. It is noteworthy that there is essentially no major difference between the sexes in the incidence of the primary chest tumours described here. Tumours occur in essence with relatively equal frequency in either lung.

Primary chest neoplasms largely manifest due to pressure effects secondary to local compression of adjacent organs, systemic symptoms when there is disseminated malignancy or as an incidental finding. Paraneoplastic syndromes are exceedingly rare. With airway obstruction or respiratory symptoms that do not respond to the usual medical treatment, computed tomography (CT) in particular can be very useful in excluding other pathology or documenting an unsuspected lesion. Whilst the presenting symptomatology can vary enormously even within the same histological group, some generalisations with regard to the presentation of chest masses can be made.

In both benign and malignant lung tumours the most frequent presenting complaints are fever, cough and pneumonitis (Hancock et al. 1993; Hartman and Shochat 1983). Haemoptysis and respiratory distress are more common with malignant pulmonary lesions. In one large review series, 27.9% of benign tumours were asymptomatic as compared to 6.3% of malignant lung tumours (Hancock et al. 1993). A child who is truly asymptomatic is twice as likely to harbour a benign pulmonary tumour, and this likelihood is even greater in children over 4 years of age. Endobronchial masses typically result in lung collapse, persistent hyperinflation or wheezing which again fails to respond to conventional treatment and may be complicated by bronchiectasis. The endobronchial location of many such lesions is often only apparent after bronchoscopy. Occasionally CT may reveal an abnormality prior to bronchoscopy being performed or, albeit less likely, when bronchoscopy is negative or not considered feasible.

Some chest wall tumours come to attention because of a superficial chest mass. Thoracic neuroblastoma and more especially the benign ganglioneuroma are often found incidentally on chest X-rays (CXR) performed for other reasons. The majority of chest wall and mediastinal tumours generally present, however, with non-specific respiratory symptoms such as airway obstruction, cough or fever due to a complicating pneumonia. In contrast to many tumours of pulmonary origin, the likely nature of the illness becomes apparent after a chest radiograph has been performed – if the film is interpreted correctly. The lung opacity is generally not typical for pneumonia with often clearly defined margins suggesting a pleural or chest wall component. Mediastinal shift or adenopathy may be seen and rib changes, in particular, should be sought as this latter finding virtually always indicates an extrapleural malignancy. In fact, the majority of mediastinal and chest wall tumours seen in children are malignant.

12.3 Imaging

Radiological studies should always begin with a frontal chest radiograph. When an unusual opacity is evident, a lateral film can be particularly helpful in assessing the trachea for compression and/or displacement, and in accurately defining the location of the abnormality, which aids greatly in differential diagnosis. For pulmonary lesions the next imaging study should be CT, as this remains the best modality to evaluate the lung parenchyma. A few limited low dose non-enhanced sections may be performed to assess for calcification but in general that is seldom necessary as calcification is usually easily discernible on post-contrast studies also. It is crucial that intravenous contrast is given to best delineate tumour extent and the relationship of a mass to the adjacent airway, major blood vessels or chest wall. A solely non-enhanced study of the thorax in this context is often a waste of time and radiation, and such CT studies invariably need to be repeated. When bronchoscopy suggests an endobronchial lesion CT may be used to confirm these findings and assess the extrabronchial spread of disease. Reconstructions in the coronal or sagittal plane, now so readily achieved with multidetector CT (MDCT) scanners, may delineate the mass to better effect. In addition virtual bronchoscopy (VB) with MDCT can allow better definition of the endobronchial anatomy when an endobronchial lesion is present. The added value of VB in this setting is unknown, however. VB can increase total examination time