Non Small-Cell Lung Cancer in a 15-Year-Old Nonsmoker

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CASE HISTORY

A previously healthy 15-year old presented to the Childrens Hospital Emergency Department with spontaneous pneumothorax, which recurred after needle thoracocentesis. Review of plain chest radiograph suggested mediastinal lymphadenopathy with compression of the left main bronchus (Fig. 1). Computed tomography of the chest confirmed these findings and also demonstrated an endobronchial left main bronchus mass (Fig. 2).

Because of the patients age, a differential diagnosis of lymphoma or germ cell tumor was formulated, but workup including tumor markers and bone-marrow examination was negative. Initial flexible bronchoscopy was not diagnostic. Rigid bronchoscopy and transcarinal tru-cut biopsy were subsequently performed by the adult thoracic surgeons and confirmed a poorly differentiated high-grade epithelial malignancy. Extensive immunohistochemistry along with tumor cell morphology and the presence of admixed reactive lymphoid cells supported a diagnosis of lymphoepithelial carcinoma (Fig. 3). Epstein Barr virus encoded RNA study and endothelial growth factor receptor mutation screen were negative.

TREATMENT

In view of the extreme rarity of nonsmall-cell lung cancer in this age group, and to ensure the appropriate provision of site- and age-specific expertise, the patients care was provided jointly by pediatric and adult oncologists. Because of the position, distribution, and volume of the tumor mass, neither surgery nor radical radiotherapy were possible at diagnosis. A decision was made to offer primary chemotherapy followed by restaging with the intention of consolidating any response with loco-regional radiotherapy.

Combination chemotherapy with gemcitabine and platinum-based chemotherapy was considered to be most appropriate, with cisplatin chosen over carboplatin in view of reported survival advantage,[1] the patients young age, and normal renal function. Gemcitabine was chosen as the most appropriate drug to combine with cisplatin in view of the absence of adenocarcinoma or large-cell histology.[2]

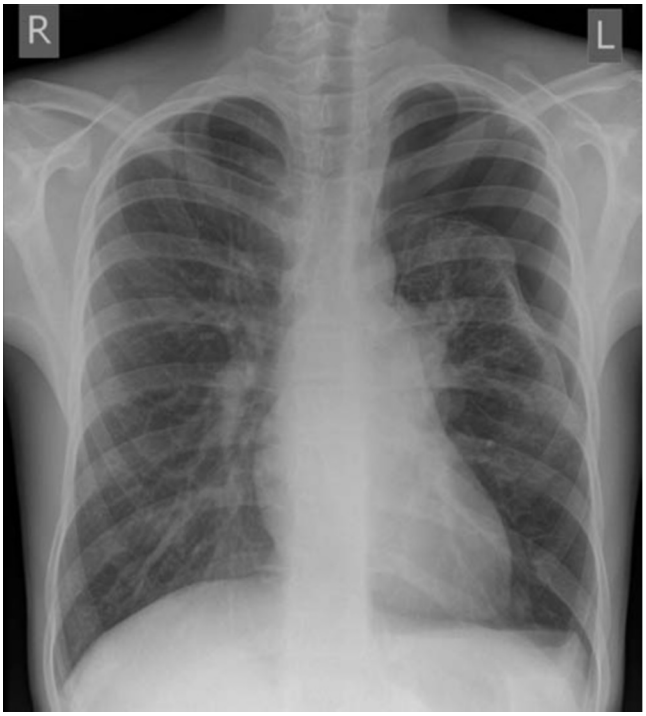

FIGURE 1. Plain chest radiograph demonstrating left-sided pneumothorax and bulky left mediastinum.

Chemotherapy was given once every 3 weeks (gemcitabine 1250mg/m^2 day 1 and day 8, cisplatin 80mg/m^2 day 1). Disease was stable after two courses. A clear major response was seen after course four, maintained after six courses.

Hypofractionated radiotherapy (55 Gy in 20 fractions) was given to consolidate the excellent response to chemotherapy. This was complicated by grade 3 esophagitis. The patient is currently in remission 28 months after presentation.

DISCUSSION

This case report describes an unusual presentation of a rare condition in the teenage and young adult (TYA) population. Accurate diagnosis required close liaison between adult and pediatric surgical teams and the input of site-specific pathology expertise. Through close cooperation between pediatric and adult services, the patient received high-quality,

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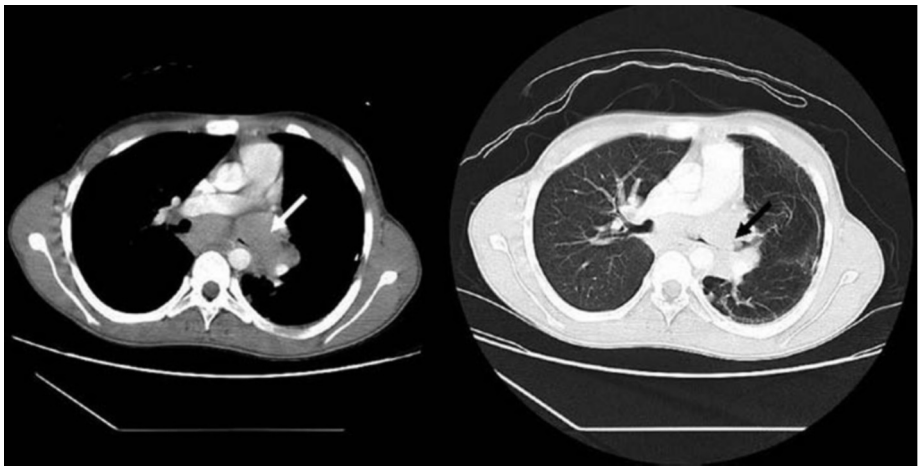

FIGURE 2. Computed tomography thorax demonstrating mediastinal adenopathy (mediastinal window, white arrow) and an endobronchial mass in the left main bronchus (lung window, black arrow).

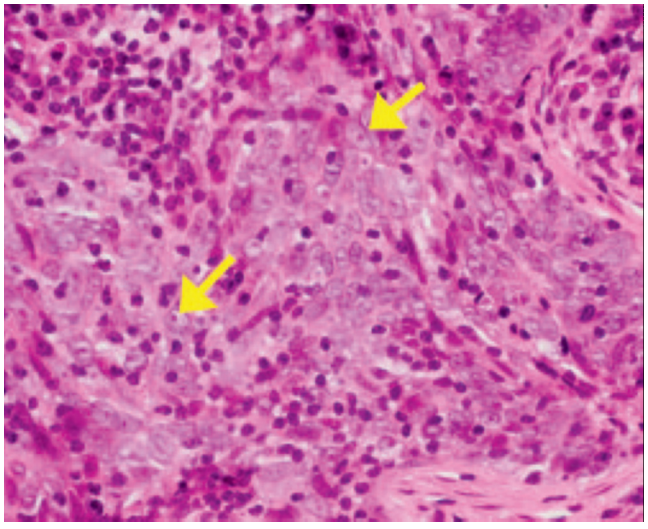

FIGURE 3. Biopsy (original magnification × 400, haematoxylin & eosin stain) showing lymphoid rich background and pleomorphic poorly defined epithelioid/polygonal cells with bland eosinophilic cytoplasm, somewhat vesicular nuclei, and prominent nucleoli (arrowed). Immunohistochemistry showed weak cytokeratin (MNF116, CK5/6) and EMA reactivity. No reactivity was seen with other keratins (AE1AE3, CAM5.2). Other markers targeting germ cell, lymphoid, and soft tissue neoplasia were negative.

age-appropriate care delivered jointly by age- and site-specific experts in line with national guidance.[3]

Although there is a rise in the incidence of epithelial tumors in the TYA age range, lung cancer remains an extremely rare diagnosis in this group. Only three other patients aged younger than 16 years have been reported to the Oxford cancer registry with a diagnosis of nonsmall-cell lung cancer since 2001 (C. Stiller, personal communication, 2011).

Lymphoepithelial cancer is an unusual primary lung cancer, recognized to occur most frequently in younger nonsmokers. It is seen most commonly in Asian populations.[4] Among Asian patients, there is a recognized association with Epstein Barr virus infection, although this was not identified in a small cohort of Western patients.[4,5] Lymphoepithelial cancer is recognized as being more chemosensitive than many primary lung cancers, and long-term survival has been reported after combination chemoradiotherapy for locally advanced disease.[4]

Contrary to much of the literature suggesting poorer outcome for TYAs with epithelial cancers,[6,7] this patient has had an encouraging response to treatment and remains in remission. Prognostic uncertainty has, however, resulted in significant psychological morbidity and the patient continues to receive support from the TYA psychosocial multidisciplinary team.

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