An unusual cause of spontaneous recurrent pneumothoraces

Introduction

Epithelioid sarcoma is a rare distinctive soft tissue neoplasm with a predilection for the distal parts of the extremities. While epithelioid sarcoma presenting as median nerve palsy or carpal tunnel syndrome has been described, epithelioid sarcoma presenting as cystic lung metastases has not been reported. This article reports a case of a man who presented with spontaneous recurrent pneumothoraces and was found to have bilateral cystic lung disease, which was ultimately diagnosed as epithelioid sarcoma with cystic lung metastases. He underwent left arm amputation, chemotherapy and radiation, but succumbed to his advanced disease.

Discussion

This case highlights the need to consider malignancy in the differential diagnosis of cystic lung disease. Epithelioid sarcoma is a high grade, soft tissue tumour that has a high propensity for local recurrence, regional lymph node involvement and distant metastases (Sobanko et al, 2009). Lung metastases are a very common presentation at the time of diagnosis of this very rare aggressive soft tissue tumour (Billingsley et al, 1999). Therefore, familiarity with this category of tumour is important for the chest physician.

The bilateral pneumothoraces may have been coincidental but, given the timing of the second presentation of pneumothorax, the bilateral pneumothoraces were most likely related to the sarcoma as the lung is the most common site of distant metastases for epithelioid sarcoma although it is never the primary site for the tumour. Moreover, epithelioid sarcoma presents initially with spontaneous pneumothorax and multiple pulmonary cysts. Hasegawa et al (1999) published a case report of a 29-year-old woman who was diagnosed with epithelioid sarcoma 7 years after presenting with recurrent pneumothoraces. Furthermore, the cytology obtained from the authors' patient's bronchoscopy confirmed the metastases of epithelioid sarcoma in the lungs.

Epithelioid sarcoma comprised less than 1% of soft tissue sarcomas seen over 13 years in the world's largest private cancer centre – Memorial Sloan-Kettering, New York (Ross et al, 1997). It typically manifests as a painless, slow-growing nodule arising within the dermis or subcutis. Less commonly, the tumour may arise from deep fascial or tenosynovial tissue. This innocuous and unusual presentation may lead to a delay in correct pathological diagnosis and treatment until continued growth or local spread prompts intervention. The authors' patient complained of chronic numbness of his left hand which may indicate that the tumour was manifesting slowly. The mean length of time from symptoms to diagnosis is 18 months (Ross et al, 1997). The mean age at the time of diagnosis in the largest case series was 29.2 years. There was a male predominance (2.7:1), and distal upper limb locations were the most common (56%) (Spillane et al, 2000).

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Case Report

A 31-year-old man presented to the casualty complaining of abrupt onset of left-sided pleuritic chest pain, which began earlier that day. The patient also complained of chronic numbness in his left hand, which had been attributed to a Volkmann's ischaemic contracture resulting from a shoulder injury. The patient had experienced a similar episode of pleuritic chest pain 2 years earlier. At that time, he was noted to have bilateral pneumothoraces which resolved with tube thoracostomy. He denied being offered surgical intervention although this was the standard of care for bilateral pneumothoraces. No aetiology of the pneumothoraces was determined as his chest computed tomography was unremarkable.

Chest auscultation revealed reduced air entry of the left side of his chest. On skin exam, a small skin lesion was noted on his left hand. The remainder of his physical examination was unremarkable. The admission chest X-ray showed a small left-sided pneumothorax with tube thoracostomy placement. A subsequent chest computed tomography scan showed multiple large cysts and a few small nodules in his lung parenchyma (*Figure 1*).

After successful re-expansion of his left lung, he was discharged with an outpatient pulmonary appointment. The patient returned 1 month later and was found to have an ulcerating lesion on his left hand. A diagnostic excisional biopsy revealed mild to moderately pleomorphic epithelioid and plump spindle cells arranged in nodular aggregates with evidence of central necrosis (*Figure 2*). A magnetic resonance imaging scan revealed extensive involvement of his left forearm. Bronchoscopy confirmed pulmonary involvement. The patient was diagnosed with epithelioid sarcoma of the left upper extremity with cystic lung metastases. The combination of epithelioid and spindle cells with evidence of central necrosis confirms the histological diagnosis (*Figure 2*). Of note, immunoreactive staining was positive for keratin, CAM5.2 and epithelial membrane antigen. The histological sample was positive for vimentin and CD34 but was negative for smooth muscle antigen.

The patient underwent a left arm amputation (*Figure 3*) with axillary node dissection, followed by locoregional radiation and systemic chemotherapy with mesna, adriamycin, ifosfamide and dacarbazine.

Repeat positron emission tomography scanning showed no evidence of distant metastases except in the lung. Metastases in the lung were confirmed by cytology from bronchoalveolar lavage from his subsequent bronchoscopy. He underwent talc pleurodesis to prevent recurrence of the pneumothoraces. The patient eventually succumbed to his disease.

Histologically, the classic form of epithelioid sarcoma is mild to moderately pleomorphic epithelioid and plump spindle cells arranged in nodular aggregates that commonly exhibit central necrosis. The combination of epithelioid and spindle cells raises the possibility of melanoma, but the positive markers for keratin, prominent necrosis, and lack of evidence of the radial growth phase helps make the distinction. Epithelioid sarcoma may be confused with squamous cell carcinoma if there is significant epidermal hyperplasia associated with ulceration. The age of the patient can be helpful in alerting one to the possibility of epithelioid sarcoma in such cases as patients with squamous cell carcinoma are typically older.

Figure 1. Computed tomography chest post-chest tube insertion, showing multiple cysts and nodules.

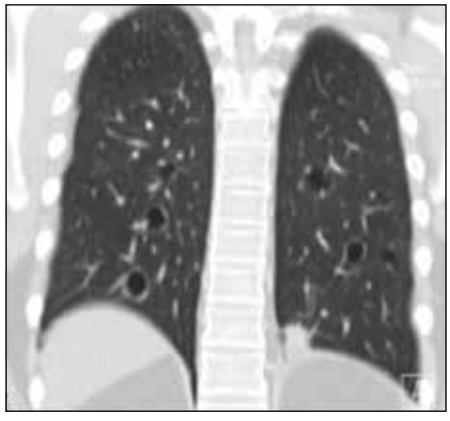


Figure 2. High power histology, showing central necrosis with mild to moderately pleomorphic epithelioid and plump spindle cells arranged in nodular aggregates which are crucial for diagnosis.

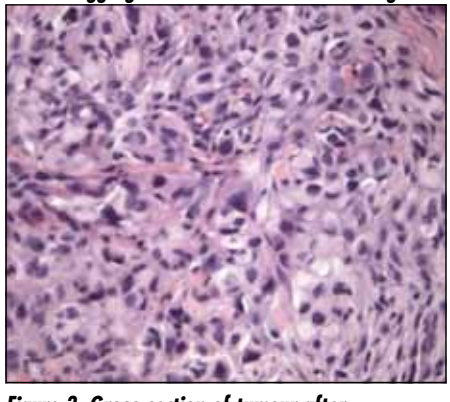
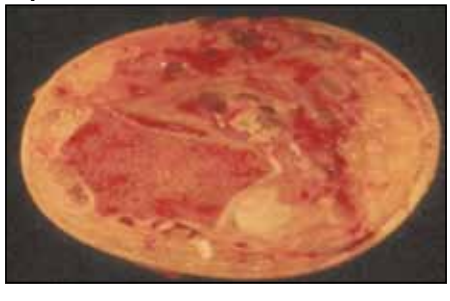


Figure 3. Gross section of tumour after amputation of the left arm.



The overall 5-year survival rate is approximately 70% and this drops to 42% after 10 years, reflecting ongoing disease-related mortality after 5 years (Chase and Enzinger, 1985). Despite the slow growth, the aggressive nature of this tumour is seen by an 85% recurrence rate after local excision (Bryan et al, 1974). Multiple local recurrences are common with this tumour and reflect a poor prognosis. Other poor prognostic factors include the depth of the tumour in relation to the deep fascia and size greater than 5 cm (Prat et al, 1978). Neither the current American Joint Committee on Cancer/International Union Against Cancer nor the Royal Marsden Hospital staging systems usefully defines prognosis for patients with epithelioid sarcoma, with poor discrimination between stages for disease-specific survival (Ramanathan et al, 1999). Distant metastases have been reported in up to 45% of patients with epithelioid sarcoma, most frequently to the lungs and pleural surfaces, with a median survival of 8 months (Enzinger, 1970).

Adequate treatment for localized disease requires early radical excision or amputation if the tumour is located in the fingers or toes. Regional lymph node dissection should be included in the surgery as lymph node metastases are common, unlike most other sarcomas. Patients presenting with regional metastasis who have wide local excision with margins that are negative on pathological examination is preferable to radical amputation in these patients (Whitworth et al, 1991). Adjuvant radiotherapy is recommended to reduce the rates of local recurrence (Suit et al, 1973). The evidence supporting the use of chemotherapy for treatment of metastatic disease in epithelioid sarcoma is lacking and is largely based on an increase of 2 months survival in a large series of soft tissue sarcoma patients treated with chemotherapy (Santoro et al, 1995). This further highlights the need for prompt diagnosis and the need to consider malignancy in the differential diagnosis of cystic lung disease. **BJHM**

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LEARNING POINTS

- Prompt diagnosis of epithelioid sarcoma is of paramount importance.
- Doctors need to consider malignancy in the differential of cystic lung disease.
- Careful and thorough physical examination are useful in a case of unknown diagnosis.
- Epithelioid sarcoma can be confused with melanoma and squamous cell carcinoma.