CASE REPORT

The journey of mesothelioma: from postmortem to FNA

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SUMMARY

A 73-year-old man, non-smoker presented with an 8-week history of left-sided chest pain and shortness of breath on exertion. He had no significant medical history. He worked in construction for 40 years, but denied definite asbestos exposure. His initial chest X-ray demonstrated a large left-sided pleural effusion. Subsequent CT thorax revealed circumferential thickening of the pleura with associated pleural plaques and calcification. A provisional diagnosis of mesothelioma was made. Initial ultrasound-guided thoracentesis revealed a transudate with negative cytology. In addition, thoracoscopy and CT-guided pleural biopsy failed to obtain a definitive diagnosis. A surgical biopsy was planned, but at the time of admission, the patient developed unilateral neck swelling. Ultrasound-guided fine-needle aspiration (FNA) and core biopsies of the lymph node were diagnostic for pleural mesothelioma. Treatment with palliative chemotherapy was planned, but the patient's clinical status rapidly deteriorated and he passed away prior to the beginning of therapy.

BACKGROUND

Mesothelioma is a rare malignancy; however, the incidence continues to rise in developed economies due to the lag period between exposure and presentation.¹ It is associated with a very poor prognosis. Historically, closed pleural biopsy was performed, but the diagnostic yield was as low as 59%.² Thoracoscopy is now the gold standard for diagnosis. However, despite improved yields, cases still remain undiagnosed.

Owing to delay in the diagnostic process and associated rapid progression of mesothelioma, patients are frequently unable to avail of systemic treatments. Fine-needle aspiration (FNA) of a cervical lymph node represents a safe and accurate diagnostic modality for advanced malignant mesothelioma if adenopathy is present. To our knowledge, this method of diagnosis has only been reported a small number of times in the literature.³

CASE PRESENTATION

A 73-year-old man presented with an 8 week history of dull, left-sided chest pain and shortness of breath on exertion (1/4 mile). He also presented with an associated dry cough, but denied haemoptysis. He had no constitutional symptoms at the time of initial presentation.

He had no significant medical or family history.

Interrogation of his social history revealed that the patient had worked in the construction industry in the UK for a prolonged period of time.

However, he denied definite asbestos exposure during this time.

INVESTIGATIONS

Multiple investigations were undertaken to obtain a definitive diagnosis. Initial staging CT thorax revealed a large left-sided pleural effusion with associated pleural thickening and involvement of the mediastinal pleural surface (figure 1). In addition, there were multiple calcified and non-calcified pleural plaques confirming previous asbestos exposure. Initial ultrasound-guided thoracentesis revealed a transudate with negative cytology. However, our clinical suspicion for mesothelioma remained high despite the initial aspirate results and, therefore, we proceeded to further investigations. Thoracoscopy was performed, which revealed evidence of a trapped lung with extensive fibrin deposition and parietal pleural inflammation. However, despite multiple biopsies, no malignancy was identified. He subsequently underwent CT-guided biopsy, which again was inconclusive. A surgical biopsy was planned, but at the time of admission, the patient reported a tender swelling on the left side of the neck, which was confirmed by ultrasound examination as a lymph node causing venous obstruction (figure 2). FNA and core biopsy were performed the following day and confirmed the diagnosis of malignant mesothelioma.

DIFFERENTIAL DIAGNOSIS

- Malignant mesothelioma
- Metastatic disease to the pleura

Figure 1 CT thorax—pleural effusion and pleural thickening.

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Figure 2 Neck ultrasound—enlarged cervical lymph node causing venous obstruction.

TREATMENT

Although palliative chemotherapy was planned, the patient's performance status deteriorated rapidly and he was unsuitable to undergo therapy.

OUTCOME AND FOLLOW-UP

Despite the negative series of investigations, we remained concerned for an underlying malignancy. During the diagnostic work-up period, the patient started to experience constitutional symptoms—night sweats, weight loss and malaise. He became increasingly short of breath and his overall performance status deteriorated. He was reviewed by oncology and palliative chemotherapy with cisplatin and pemetrexed was planned. However, the general deterioration continued and he became bedbound, with an associated deterioration in his performance status. He was transferred to the hospice and died 4 weeks after the diagnosis was obtained.

DISCUSSION

Malignant mesothelioma is a rapidly progressive and a near universally fatal malignancy. Although metastatic disease does occur, it is rare for the initial diagnosis to be made from an extra-thoracic site.⁴ The malignancy is closely linked with asbestos exposure. It usually presents after a prolonged lag period and is predominant in men. Presenting features include shortness of breath, unilateral dull chest pain and pleural effusion on examination. The average duration of survival from diagnosis is approximately 12 months.⁵ Despite a ban on asbestos use in developed countries, the incidence of mesothelioma is expected to continue to rise. Therefore, it is crucial, that physicians are aware of available algorithms to attempt early diagnosis in this disease.¹

Radiological investigations, including a chest X-ray and CT thorax are usually performed at presentation. Multiple features can be seen, including pleural thickening and pleural effusion. The presence of pleural plaques, both calcified and non-calcified confirms previous exposure to asbestos.

Initial examination of pleural fluid obtained at thoracentesis is associated with a low diagnostic yield.⁵ Tissue is essential for definitive diagnosis of mesothelioma and also offers important prognostic information based on subtype of disease.⁶ Histological examination of closed pleural biopsy has a low diagnostic yield, reported as positive in less than 60% of cases.² Thoracoscopic biopsy has a better sensitivity and is well

tolerated, but in a small proportion of cases, it is unable to obtain a final definitive diagnosis, as in the case presented.⁷ In this scenario, patients are frequently followed up on closely and if there is evidence of disease progression, further procedures are performed. These would include CT-guided pleural biopsy, especially if there is discrete pleural thickening or surgical biopsy. Positron emission tomography scan may also be considered at this stage to assess the extent of the disease.

In addition, FNA of a metastatic lymph node, usually a cervical lymph node has been reported as a possible site for obtaining diagnostic material; however to date, there have only been a handful of cases diagnosed in this manner around the world.³ This emphasises the importance of a full and detailed examination, as presence of lymphadenopathy may significantly alter the diagnostic pathway.

Treatment options are relatively few and frequently have limited efficacy. The role of surgery in the management of malignant mesothelioma remains controversial and of probable limited benefit, except in highly selected cases. Palliative chemotherapy with cisplatin and pemetrexed doublet is the mainstay of treatment in the majority of cases.⁸ Radiotherapy is often reserved for focal chest wall pain from invasion or management of port site metastases.

It is important to obtain an early definitive diagnosis, as this allows the beginning of systemic therapy at a time when patients may enjoy a better quality of life with an associated improved performance status. In addition, the subtype of mesothelioma offers important prognostic information.⁶

FNA and/or core biopsy under direct ultrasound guidance of a lymph node is a safe and rapid diagnostic tool, which may obtain a tissue diagnosis in a portion of patients with malignant mesothelioma. It may be especially useful in cases where usual investigations fail to provide definitive diagnosis.

Learning points

- ▶ Malignant mesothelioma is a rapidly progressive malignancy and should be considered in all patients presenting with shortness of breath and chest pain, especially if they have been exposed to asbestos in the past.
- ▶ The incidence of mesothelioma is increasing.
- ▶ Early definitive diagnosis is important to allow immediate start of treatment and may be associated with improved overall survival.
- ▶ Fine-needle aspiration of a metastatic lymph node is a safe, rapid and effective diagnostic method.

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