

# Images in *Thorax*

## Calcifying fibrous pseudotumour of the lung

A 2.5 cm mass abutting the right hilum was found on an employment screening chest radiograph in a 31 year old asymptomatic man (fig 1). Chest CT scans with and without contrast showed a non-enhancing soft tissue mass with no fat or calcification (fig 2). T2 weighted MR images excluded a cystic fluid collection. At 6 month follow up a repeat CT scan showed a 4 mm increase in size and a right middle lobectomy was performed.

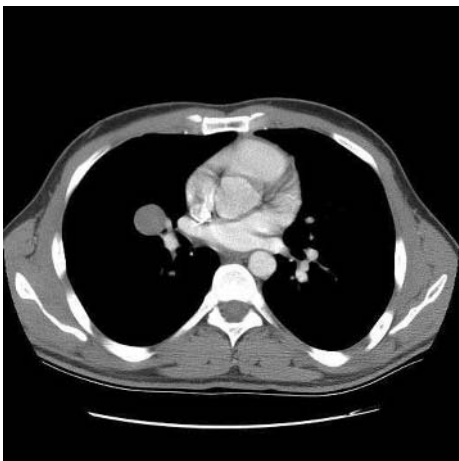
Grossly the lung section showed a firm tan well circumscribed mass 2.7 cm in diameter situated in the lung parenchyma without any connection to the pleura (fig 3). Microscopically the lesion was composed of abundant dense hyalinised collagen associated with a scant lymphoplasmacytic

infiltrate and lymphoid aggregates, predominantly at the periphery. Foci of psammomatous (rounded, lamellar) and dystrophic calcification were distributed throughout the nodule (fig 4). Immunohistochemistry showed positive factor VIII staining of the fibroblasts, which were also negative for CD34, smooth muscle actin, muscle specific actin and desmin. There was no granulomatous inflammation or necrosis.

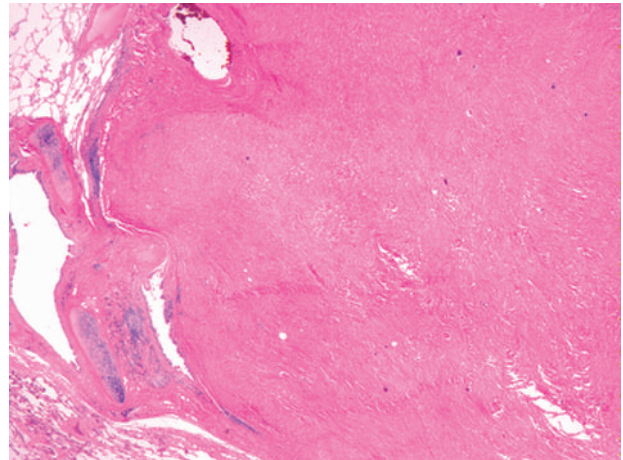
Calcifying fibrous pseudotumour (CFPT) is a rare benign lesion composed of hyalinised collagen with psammomatous/dystrophic calcification and a typical pattern of lymphocytic inflammation. This lesion usually occurs within soft tissues<sup>1</sup> but has been described in the chest wall, pleura,<sup>2</sup> and



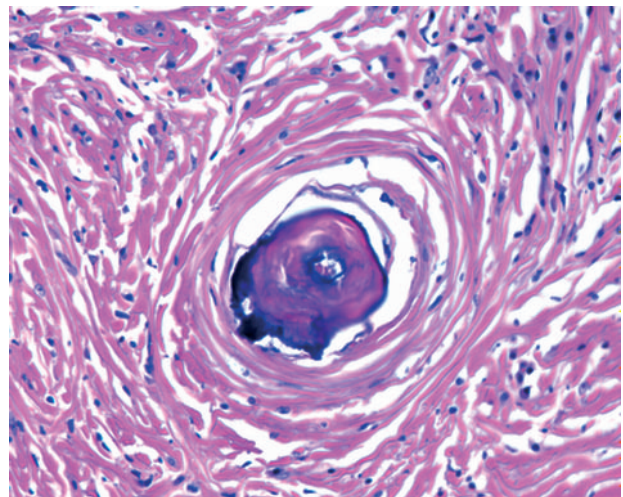
**Figure 1** PA chest radiograph showing a well circumscribed mass abutting the right hilum.



**Figure 2** CT scan of the chest showing a sharply circumscribed homogenous soft tissue attenuation mass within the right middle lobe.



**Figure 3** Low power photomicrograph showing a well circumscribed fibrous nodule within the lung parenchyma. It is juxtaposed to a bronchovascular structure but does not appear to originate directly from it (25× original magnification).



**Figure 4** High power photomicrograph showing hyalinised dense collagen bundles, low cellularity, scattered lymphocytes, and psammomatous calcification (200× original magnification).

mediastinum. It has not previously been described in the lung. The pathogenesis is unclear but it has been suggested that these lesions are secondary to a benign inflammatory stimulus.

The differential diagnosis includes localised fibrous tumour of pleura, pulmonary hyalinising granuloma, calcifying granulomas, inflammatory (myofibroblastic) pseudotumour, and amyloidoma. These lesions can be differentiated from CFPT on the basis of conventional histopathology and immunohistochemistry. CFPT has a good prognosis with rare recurrences.<sup>2</sup>

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## REFERENCES

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- 2 **Cavazza A**, Gelli MC, Agostini L, *et al*. Calcified pseudotumor of the pleura: description of a case. *Pathologica* 2002;**94**:201–5.

## LUNG ALERT .....

### Viral regulation of inflammatory cytokines in epithelial cells: an alternative signalling pathway

▲ Meusel TR, Imani F. Viral induction of inflammatory cytokines in human epithelial cells follows a p38 mitogen-activated protein kinase-dependent but NF-κB-independent pathway. *J Immunol* 2003;**171**:3768–74

Respiratory viruses primarily target the bronchial epithelium and induce the expression of several inflammatory cytokines and chemokines. These include tumour necrosis factor alpha (TNF-α) and interleukin 1β (IL-1β) which are key regulatory factors in the early induction of inflammation and Th1/Th2 immune responses. A number of cellular signalling pathways are thought to play a role in this context including nuclear factor-κB (NF-κB), a ubiquitous transcription factor which has been shown to be important in inflammatory cytokine expression. However, the molecular mechanisms governing virus induced epithelial inflammatory responses are largely unknown.

In this study both primary human bronchial epithelial cells and cell lines were cultured and infected with either wild-type reovirus or respiratory syncytial virus (RSV). Cells were also treated with double stranded RNA (dsRNA), used as a viral mimetic. Total cellular RNA was then extracted and subjected to RT-PCR using specific primers to quantify the levels of the cytokines TNF-α and IL-1β produced. Western blot analysis was performed to detect activation of different signalling molecules.

Infection of epithelial cells with either virus induced inflammatory cytokines in a time-dependent manner. dsRNA treatment stimulated cytokine production similarly. Interestingly, inhibition of NF-κB did not significantly reduce viral or dsRNA induction of either cytokine. However, viral infection and dsRNA treatment were shown to activate the p38 mitogen-activated protein K (p38 MAPK) signalling pathway in epithelial cells. This kinase is important in the induction of innate immune responses and the activation of adaptive immune lymphocytes. Inhibition of p38 MAPK by two different pharmacological inhibitors showed that expression of dsRNA induced TNF-α and IL-1β required activation of this signalling protein.

This study has shown that signalling pathways distinct from NF-κB may be important in early cytokine responses to viral infection, and NF-κB activation may be less pivotal than previously thought. This is supported by similar findings from a recent study of cytokine induction by human rhinovirus infection of bronchial epithelial cells (Kim *et al*. *J Immunol* 2000;**165**:3384–92). Studies examining other possible signalling pathways are now needed to further our understanding of the cellular mechanisms of virus induced airway inflammation.

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