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Particulate material pulmonary embolism

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URL of Article

Particulate material pulmonary embolism (PE) is a type of non-thrombotic [pulmonary embolism](#) caused by a variety of non-organic particulate materials.

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Epidemiology

Unlike bland thrombotic pulmonary embolism, non-thrombotic pulmonary embolism is uncommon. The exact incidence varies from one study to another and is very much dependent on the underlying cause.

Particulate material pulmonary embolism can occur in various clinical contexts:

- cosmetic procedures involving dermal fillers, e.g. hyaluronic acid in breast or vaginal augmentations

- [intravenous drug use](#)

Clinical presentation

Particulate material pulmonary embolism often presents with atypical clinical features. However, the patients may give a very specific history that is related to the presentation (e.g. recent injectable cosmetic procedure, intravenous drug use).

Pathology

The pathogenesis of non-thrombotic pulmonary embolism is more complex than a simple mechanical vascular obstruction, and very much dependent on the type of embolic material.

Intravascular injection of microscopic particulate material is said to induce pulmonary granulomatosis, occurring due to delayed hypersensitivity response. The granuloma formation and subsequent fibrosis result in eventual distortion of the pulmonary architecture. Eventually, [pulmonary hypertension](#) may occur.

Microscopic appearance

The histopathological examination will often be suggestive, revealing a granulomatous foreign body reaction with the presence of multinucleated giant cells. Amorphous basophilic materials will also be seen within the pulmonary vessels and lung parenchyma.

Radiographic features

Plain radiograph

No specific plain radiograph features. Peripherally located ground glass changes or opacities may be seen.

CT

CT findings depend on the size of the particulate material. Unlike bland thromboembolic pulmonary embolism, a filling defect may not be seen within the major pulmonary arteries and parenchymal changes may be the predominant feature (especially in cases of microscopic particles).

CT will demonstrate the presence of peripherally located subpleural air-space [ground-glass opacities](#), reflecting the presence of exudates consistent with foreign body reactive inflammatory changes within the distal vasculature. These changes may be wedged-shaped in appearance.

Treatment and prognosis

Treatment is usually supportive and targeted at reducing underlying inflammation. Supplemental oxygen is often necessary. Corticosteroids are usually administered to control the underlying inflammation.

Prognosis is usually good, although deaths have been reported. Pulmonary hypertension may occur as an end result of the lung insult.

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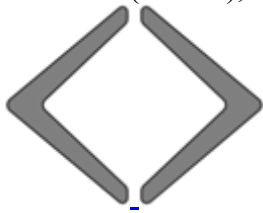
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