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Visualizing Early Pleuritis During Talc Poudrage: A Thoracoscopic Perspective

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Abstract

We present a thoracoscopic image capturing the immediate pleural reaction following talc poudrage—characterized by a fine talc dust coating and early inflammatory changes. This image underscores the inflammatory cascade and mesothelial disruption central to pleurodesis, reinforcing its educational and clinical value.

Keywords: Pleural effusion; Medical thoracoscopy; Talc pleurodesis

Introduction

Talc pleurodesis remains the gold standard for long-term prevention of recurrent pleural effusions and pneumothorax, with success rates exceeding 80-90% in well-selected patients.

Administered via thoracoscopy (poudrage) or chest drain (slurry), talc is favored for its potent ability to induce controlled inflammation, fibrin deposition, and eventual pleural symphysis [1].

Case Report

A 58-year-old female patient with a history of a pulmonary tumor with bone metastases and high blood pressure managed by amlodipine was admitted to the thoracic surgery department for NYHA class III dyspnea. Clinical examination revealed a patient in poor general condition, afebrile, and conscious. Hemodynamically, her blood pressure (BP) was 110/65 mmHg, and her heart rate (HR) was 120 beats per minute. The respiratory examination showed a tachypneic patient with shallow breathing. Peripheral oxygen saturation (SpO_2) in ambient air was 90%. The surgical procedure consisted of thoracoscopy with talc pleurodesis. During the 1.5-hour procedure, the saturation remained stable under protective mechanical ventilation with a tidal volume (Vt) of 6 mL/kg and FiO_2 at 50%. At the end of the surgery, the decision was made to implement HFOT to prevent postoperative respiratory distress, thereby facilitating the transition to spontaneous ventilation with extubation under HFOT.

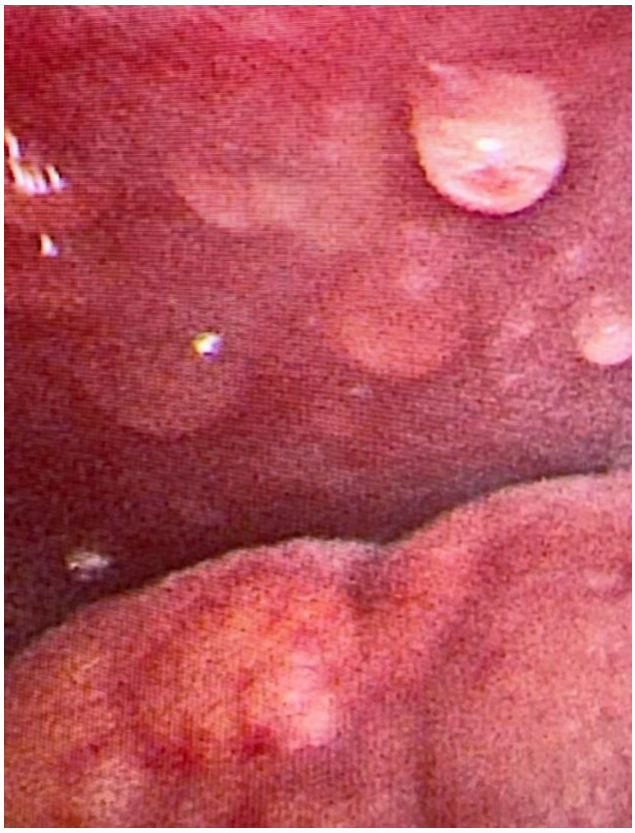

Figure 1: Visualizing Early Pleuritis during Talc Poudrage.

Thoracoscopic Image Reveals:

A fine, white talc layer diffusely coating the visceral pleura, resembling textbook descriptions and prior publications.

Underlying pleural surface erythema and raised granular texture, indicative of early mesothelial disruption and exudative reaction.

No dense adhesions—suggesting visualization during the acute phase, likely minutes to hours post-poudrage.

This stage precedes mature symphysis but captures the critical window of inflammation initiation.

Discussion

Pleurodesis is a procedure that obliterates the pleural space to prevent recurrent pleural effusions, pneumothorax, or persistent pneumothorax. This procedure involves draining pleural fluid or intrapleural air followed by either mechanical abrasion or instilling a chemical irritant to induce inflammation and fibrosis, leading to adhesions between the visceral and parietal pleura. Common indications include recurrent malignant pleural effusions, particularly in patients with metastatic cancers, as well as recurrent pneumothorax. Chemical pleurodesis uses agents like talc, while mechanical pleurodesis is often performed after thoracic surgery. The choice between the methods depends on the patient's clinical condition and specific diagnosis [2].

Talc works by inciting cytokine-mediated inflammation—elevating IL 8, MCP 1, VEGF, PDGF, bFGF, and TGF β—while promoting fibrin deposition and suppressing fibrinolysis, ultimately fostering pleural fibrosis and adhesion.

The talc particles act as irritants that trigger mesothelial activation, leading to early exudate, leukocytic infiltration, and gradual fibroblast-driven organization [3].

Imaging Correlation

Later-stage talc pleurodesis may demonstrate pleural thickening (often nodular or linear) and deposition of high-attenuation foci on CT, which can persist and mimic malignancy; increased FDG uptake is also common due to ongoing macrophage activity and granuloma formation

These post-pleurodesis changes can last for years and present diagnostic challenges, especially in oncologic follow-up [4].

Clinical Significance

This thoracoscopic image is pedagogically powerful—it visually illustrates the early inflammatory milieu essential for successful pleurodesis. It enhances understanding of:

• The physiological basis for talc's effectiveness.

• The temporal progression from inflammation to fibrosis.

• Why pleural thickening with FDG uptake may persist and complicate follow-up.

It can be a valuable teaching tool in pulmonology, thoracic surgery, and pathology forums [5].

Conclusion

This image eloquently captures the formative stage of talc-induced pleuritis: acute talc deposition, mesothelial irritation, and granulomatous initiation. When supported by clinical details and referenced mechanistic literature, it offers substantive value for both publication and professional education.

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