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Original Research Paper

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ROLE OF TRANSBRONCHIAL LUNG CRYOBIOPSY IN DIAGNOSING ORGANISING PNEUMONIA: A CASE REPORT OF NON-RESOLVING PNEUMONIA

Dr Nuthan GN* — Senior Resident, Department of Pulmonary Medicine, Siddaganga Medical College & Research Institute, Tumkur, Karnataka*Corresponding Author

Dr Ravikumar P — Professor and Head of Department, Department of Pulmonary Medicine Siddaganga Medical College & Research Institute, Tumkur, Karnataka

Dr P Jagadeesh Kumar — Associate professor, Department of Pulmonary Medicine, Siddaganga Medical College & Research Institute, Tumkur, Karnataka

ABSTRACT

Background: Organising pneumonia (OP) can present as a non-resolving pulmonary consolidation, often posing diagnostic challenges, particularly when routine biopsies are inconclusive. **Case Presentation:** We report a 57-year-old female with a one-year history of persistent right middle lobe consolidation unresponsive to antibiotics, with negative autoimmune and infectious workup. CT-guided biopsy was inconclusive. **Intervention & Outcome:** Transbronchial lung cryobiopsy (TBLC) under fluoroscopic guidance yielded adequate tissue from the lesion, revealing histological features of organising pneumonia with peribronchiolar metaplasia and lymphoid aggregates with plasma cells. Infectious etiology was excluded. The patient improved clinically after corticosteroid therapy. **Conclusion:** TBLC is a safe, minimally invasive, and high-yield diagnostic option in non-resolving pneumonia, reducing the need for surgical lung biopsy.

KEYWORDS : Organising pneumonia, Cryobiopsy, Non-resolving pneumonia, Interstitial lung disease, Case report.

INTRODUCTION

Organising pneumonia (OP) is a histopathologic pattern characterised by intra-alveolar buds of granulation tissue (Masson bodies) and variable interstitial inflammation. Clinically, it often presents with cough, dyspnoea, and radiographic consolidation that may mimic infection.

Although it can be cryptogenic (cryptogenic organising pneumonia, COP), OP is often secondary to infections, drugs, connective tissue diseases, or environmental exposures.

Diagnosis relies on histopathology. Conventional transbronchial forceps biopsies often yield small and artefact-prone samples, limiting diagnostic accuracy. CT-guided biopsies, while useful, may be non-diagnostic in patchy or peribronchiolar lesions.

Transbronchial lung cryobiopsy (TBLC) allows retrieval of larger, well-preserved tissue samples from targeted lung regions under fluoroscopic guidance, improving diagnostic yield and preserving architecture.

Case Presentation

A 57-year-old female presented with a persistent cough and right middle lobe consolidation for 12 months. She denied smoking, occupational exposures, or systemic symptoms. There were no comorbidities.

She had multiple antibiotic courses with no radiographic improvement.

Investigations:

- Complete blood count, renal and liver function tests: Normal.
- Autoimmune panel: ANA, ANCA, rheumatoid factor, serum ACE — all negative.
- CRP: Within normal limits.
- Infectious testing: Negative for bacterial, mycobacterial, and fungal pathogens.
- HRCT chest: Persistent right middle lobe consolidation with air bronchograms, no mass lesion.
- Previous CT-guided lung biopsy: Inconclusive.

Given the persistence and inconclusive prior biopsy, TBLC was planned.

Procedure

The procedure was performed under conscious sedation and fluoroscopic guidance. A 1.9 mm cryoprobe was advanced to the target segment in the right middle lobe. Freezing time was 5 seconds, and specimens were removed en bloc with the bronchoscope. Two adequate tissue samples were obtained without complications such as pneumothorax or major bleeding.

Findings:

Figure 1: Fluoroscopic Guidance During Cryobiopsy Showing Cryoprobe Position in the Lung.

Figure 2: Gross Specimen Obtained from Transbronchial Lung Cryobiopsy.

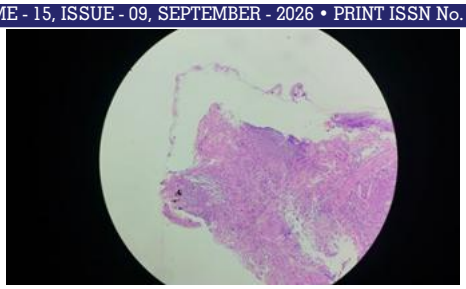

Figure 3: Medium-power view Highlighting Peribronchiolar Metaplasia and Lymphoid Aggregates (h&e Stain).

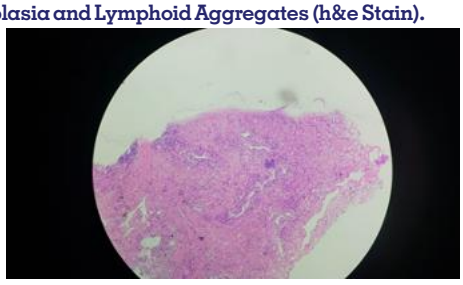

Figure 4: High-power View Showing Plasma cell rich Lymphoid Aggregates and Preserved Alveolar Architecture (h&e Stain).

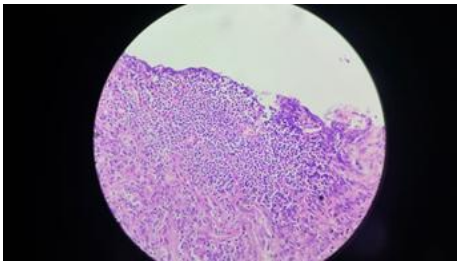

Figure 5: Cryobiopsy Specimen Demonstrating well-preserved Lung Parenchyma Without Crush Artefact (h&e Stain).

Forceps biopsy showed bronchial mucosa with mild inflammation. Cryobiopsy revealed dilated bronchioles with mucus plugs and inflammatory infiltrates; adjacent parenchyma showed type II pneumocyte hyperplasia and peribronchiolar metaplasia. The stroma demonstrated lymphoid aggregates with plasma cells. No vasculitis, granulomas, or fungal elements were identified. Final diagnosis: Organising pneu-monia with peribronchiolar metaplasia (infectious etiology excluded).

MANAGEMENT AND OUTCOME

The patient was started on oral prednisolone 40 mg daily with a tapering schedule. She demonstrated symptomatic improvement, and radiological follow-up is planned.

DISCUSSION

Non-resolving pneumonia can result from infections, malignancy, and inflammatory conditions like OP. The absence of infection, autoimmune markers, and negative CT-guided biopsy in our patient necessitated a more targeted diagnostic approach.

TBLC has been increasingly adopted for interstitial and focal parenchymal lung diseases due to its superior diagnostic yield (up to 85%) compared to conventional TBLB (30–40%). Cryobiopsy specimens are larger (mean size 8–10 mm) and have fewer crush artefacts, allowing better histologic interpretation.

In OP, early histologic confirmation is important as corticosteroid therapy typically results in rapid clinical and radiographic improvement. In our case, TBLC was decisive in avoiding a surgical lung biopsy, reducing patient morbidity and cost.

The role of transbronchial lung cryobiopsy (TBLC) has grown substantially over the past decade, particularly in cases of diffuse parenchymal lung diseases and non-resolving pneumonias where less invasive modalities have failed to provide a diagnosis. In this patient, TBLC proved decisive, not only by yielding a large, well-preserved sample but also by avoiding the morbidity associated with surgical lung biopsy.

Fluoroscopic guidance, as demonstrated in Figure 1, is crucial for ensuring that the cryoprobe is positioned precisely in the target area while minimizing the risk of sampling from vascular-rich or pleural-adjacent regions. This procedural adjunct directly impacts diagnostic yield and safety, particularly by reducing the risk of pneumothorax and significant bleeding.

Gross examination of the specimen, shown in Figure 2, highlights another advantage of TBLC: retrieval of sizable, intact tissue cores with preserved architecture. This contrasts sharply with conventional forceps biopsies, which often suffer from crush artefact and limited tissue volume, leading to inconclusive results.

Histopathology in this case confirmed organising pneumonia with peribronchiolar metaplasia and lymphoid aggregates, allowing prompt initiation of corticosteroid therapy. Early and accurate diagnosis of OP is particularly important as it typically responds well to treatment, preventing chronic respiratory impairment. Literature consistently reports TBLC diagnostic yields in the range of 80–85%, with complication rates that are acceptable in experienced hands.

Ultimately, this case underscores how TBLC, combined with real-time imaging and careful patient selection, can bridge the gap between inconclusive imaging and histological certainty, guiding timely and targeted management while avoiding more invasive surgical approaches.

CONCLUSION

TBLC is a valuable, minimally invasive diagnostic tool in non-resolving pneumonia, particularly when previous biopsies are inconclusive. Its ability to obtain high-quality, adequately sized specimens from targeted segments makes it ideal for diagnosing OP and other interstitial lung diseases.

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