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Original Research

Decoding Aspergillus: A Surgical Study on Predictors and Prevalence of Chronic Pulmonary Aspergillosis in a Tertiary Centre in Central India

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Abstract
Background: Chronic Pulmonary Aspergillosis (CPA) often follows pulmonary tuberculosis, posing diagnostic and therapeutic challenges in surgical practice.
Objective: To study the prevalence, clinical predictors, and surgical outcomes of CPA in a tertiary care setting.
Methods: A prospective, cross-sectional study was conducted on 35 patients between December 2023 and January 2025. Patients were diagnosed based on radiology, microbiology, and serology. Surgical intervention was offered in selected cases.
Results: CPA was confirmed in 12 patients (34.3%). History of tuberculosis (83.3%), COPD (41.7%), and diabetes mellitus (25%) were significantly associated. Four patients underwent surgery with favorable outcomes.
Conclusion: Surgical management is safe and effective in localized CPA with hemoptysis or unresponsive symptoms. Surgeons must maintain a high index of suspicion in TB-endemic regions.
Keywords: Chronic Pulmonary Aspergillosis, Hemoptysis, Aspergilloma, Cavitary Lung Disease, Thoracic Surgery

Introduction

CPA comprises a group of pulmonary diseases caused by *Aspergillus fumigatus*, typically developing in patients with pre-existing lung conditions such as tuberculosis, COPD, and sarcoidosis. In India, the overlap with post-TB sequelae makes CPA a diagnostic dilemma. Surgical management, though less common, remains a valuable option for selected cases, especially with hemoptysis or failure of antifungal therapy.

Materials and Methods

Study Design and Setting

A prospective cross-sectional study was conducted at the Department of General Surgery and CTVS, L.N. Medical College and J.K. Hospital, Bhopal, from December 2023 to January 2025.

Inclusion Criteria

- Age >18 years
- Chronic respiratory symptoms >3 months
- Radiological evidence of cavitary lesions
- Positive *Aspergillus*-specific IgG or fungal culture

Exclusion Criteria

- Immunosuppressed patients (e.g., HIV positive)
- Invasive pulmonary aspergillosis
- Incomplete diagnostic records

Investigations Performed

- **Radiology:** High-resolution CT thorax
- **Microbiology:** Fungal culture from sputum/BAL
- **Serology:** Aspergillus-specific IgG ELISA

Surgical Indications

- Recurrent/massive hemoptysis

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- Symptomatic aspergilloma not responding to medical therapy
- Localized CPA with functional impairment

Statistical Analysis

Data analyzed using SPSS v25. Chi-square test applied for categorical variables. *p*-value <0.05 was considered statistically significant.

Results

Demographic and Clinical Profile

Table 1: Baseline Characteristics of Study Population (N = 35)

Variable	Total (%)	CPA Cases (n = 12)	*p*-value
Mean Age (years)	46.1 ± 10.8	47.8 ± 9.3	—
Male	22 (62.9%)	8 (66.7%)	0.65
Prior TB History	23 (65.7%)	10 (83.3%)	0.001*
COPD	10 (28.6%)	5 (41.7%)	0.032*
Diabetes Mellitus	7 (20%)	3 (25%)	0.041*

*Statistically significant

Intraoperative Findings

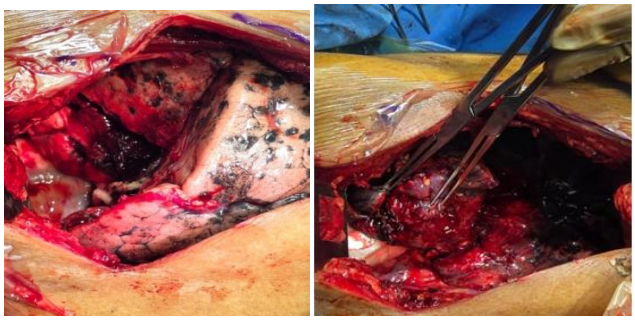

Figure 1: Showing Aspergilloma in Upper Lobe Cavity

(*Insert HRCT image or schematic of cavity with fungal ball*)

- Cavitary lesion: 12/12 (100%)
- Fungal ball: 4/12 (33.3%)
- Paracavitary fibrosis: 7/12 (58.3%)

Microbiology and Serology

Table 2: Diagnostic Yield in CPA Patients

Diagnostic Tool	Positive Cases (n=12)	Percentage (%)
Aspergillus IgG ELISA	11	91.7%
Fungal Culture (*A. fumigatus*)	6	50%
Bronchoscopy (selected)	3	—

Surgical Management

Four patients underwent surgery:

- **Lobectomy:** 3 cases
- **Segmentectomy:** 1 case

Figure 2: Postoperative Recovery Status (at 6 months)

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Outcome	Patients (n=4)
Complete Symptom Relief	3
Minor Complication	1 (air leak)
Recurrence	0

Discussion

CPA is frequently underdiagnosed due to clinical mimicry with TB and limited diagnostic access. In our study, CPA prevalence was 34.3% among chronic lung symptom patients. Surgical resection remains an effective option in carefully selected cases, with minimal complications.

Our findings support early surgical referral in patients with hemoptysis, large fungal balls, or non-resolving symptoms despite antifungal therapy. Postoperative outcomes were favorable with good recovery and no mortality.

Conclusion

CPA is a surgically relevant disease in TB-endemic regions. Surgeons should consider it in patients with persistent cavitary lesions and hemoptysis. Surgical resection is safe and effective in properly selected cases.

Declarations

- **Conflicts of Interest:** None
- **Funding:** No financial support received
- **Ethical Approval:** Approved by the Institutional Ethics Committee (LNMC/2023/CTVS/CPA)
- **Acknowledgment:** We thank the Departments of Pulmonology and Microbiology for their collaboration

References

1. Denning DW, et al. Chronic pulmonary aspergillosis: rationale and clinical guidelines. Eur Respir J. 2016.
2. Sehgal IS, et al. Clinical spectrum and diagnosis of CPA. Lung India. 2019.
3. Page ID, Denning DW. The incidence of CPA in India. Eur Respir J. 2019.
4. Kosmidis C, Denning DW. Overview of fungal lung infections. Eur Respir Rev. 2015.