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**Anti-Fungal Chemotherapy for Symptomatic Pulmonary Aspergilloma**

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Although radical treatment of pulmonary aspergilloma is surgical resection (1, 2), it is often difficult for aged patients with low pulmonary function. In this study, we attempted to determine the indications for systemic anti-fungal treatment in cases of symptomatic pulmonary aspergilloma.

From January 1994 to July 1998, 40 aspergilloma cases admitted with symptoms of hemoptysis and fever were evaluated retrospectively. The diagnosis of aspergilloma was based on the following findings: 1) existence of a fungus ball in the cavitory lesion on chest X-ray film and/or CT scan, 2) detection of *Aspergillus* sp. in specimens obtained from the airway, such as expectorated sputum and broncho-alveolar lavage fluid, and 3) positive result of serum aspergillus precipitin test. The effectiveness of anti-fungal treatment was assessed by 1) clinical symptoms, 2) radiological findings, and 3) microbiological data. If the patients remained unchanged in regard to the three criteria or if at least one criterion showed unfavorable changes, the therapy was considered ineffective; otherwise it was considered effective. Statistical evaluation was assessed using the Mann-Whitney test.

Among the 40 cases treated, 21 (53%) cases were treated only with anti-fungal chemotherapy (chemotherapy group), 17 (43%) cases surgically (surgical group), and 2 cases symptomatically.

Anti-fungal therapy was conducted as follows. Fourteen (67%) cases were treated with amphotericin B (AMPH), 16 (76%) with itraconazol (ITCZ), and 11 (52%) with an AMPH-ITCZ combination. Fluconazol and 5-FC were used for 5 and 2 cases, respectively.

The outcomes of the anti-fungal treatment are shown in

Table 1. A good response was obtained in 9 of 21 cases (42.8%). In particular, 5 cases showed complete disappearance of the fungus ball after anti-fungal treatment; as revealed by CT scan, all of them had a "spongiform" fungus ball before the therapy (Fig.).

In terms of the adverse effects of anti-fungal drugs, 5 (36%) cases experienced renal dysfunction caused by AMPH, and 4 (25%) cases experienced abdominal discomfort caused by ITCZ.

The surgical group consisted of significantly younger subjects with better nutritional states in comparison with the chemotherapy group. Pulmonary function of the surgical group was significantly better than the chemotherapy group (Table 2). These results suggest that aged and/or low pulmonary function patients may be indicated for anti-fungal treatment. However, the anti-fungal chemotherapy for pulmonary aspergilloma has not been fully evaluated (3). Combination chemotherapy with AMPH and ITCZ has remained contro-

Table 1. Outcome of anti-fungal systemic chemotherapy for patients with aspergilloma

	No. (%)			
	Complete response	Improved	Unchanged	Worsened
Symptoms	–	10 (48)	9 (43)	2 (10)
Radiological findings	5 (24)	6 (29)	6 (29)	4 (19)
Microbiological examinations	–	10 (48)	7 (33)	4 (19)
Total Assessment	Effective	Ineffective		
	9 (43%)	12 (57%)		

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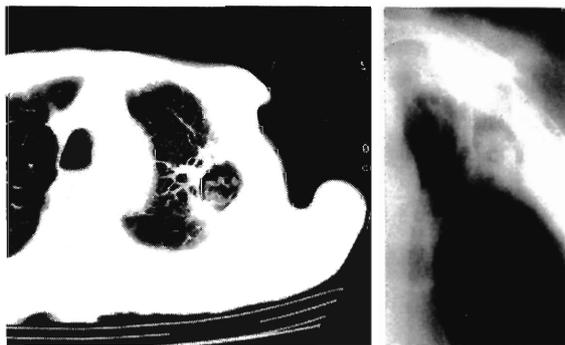


Figure. "Spongiform" fungus ball observed by CT scan (left) and tomography (right).

Table 2. Comparison of chemotherapy and surgical patient groups

	Chemotherapy group	Surgical group	P
Age (yrs)	64.1±11.0	55.7±14.3	0.047
Body weight (kg)	45.4±8.0	53.3±9.6	0.011
VC (l)	2.05±0.90	2.73±0.85	0.042
FEV <sub>1,0</sub> (l)	1.43±0.51	1.98±0.61	0.014
PaO <sub>2</sub> (Torr)	75.6±12.6	86.3±8.9	0.009

mean±S.D., VC: vital capacity, FEV<sub>1,0</sub>: forced expiratory volume in first second, PaO<sub>2</sub>: partial pressure of O<sub>2</sub> in arterial blood.

versial (4), though it has been reported as effective in certain cases of aspergillosis (5). In our study, the AMPH and ITCZ combination produced a good result. The response rate of anti-fungal treatment for aspergilloma in our study was 42.8% in agreement with other reports (6). Good response was obtained in cases showing "spongiform" fungus balls on CT

scans. Roberts suggested that a spongiform fungus ball reflects an early stage of fungus ball development (7).

In conclusion, anti-fungal chemotherapy has a potential for successfully treating aspergilloma. It can be indicated for non-operable symptomatic aspergilloma cases, particularly if the patients have a "spongiform" fungus ball on CT scans.

## REFERENCES

1. Oakley, R. E., Petrou, M. and Goldstraw, P. (1997): Indications and outcome of surgery for pulmonary aspergilloma. *Thorax*, 52, 813-815.
2. Glimp, A. R. and Bayer, S. A. (1983): Pulmonary aspergilloma: diagnostic and therapeutic considerations. *Arch. Intern. Med.*, 143, 303-308.
3. Hammerman, K. J., Sarosi, G. A. and Tosh, F. E. (1974): Amphotericin B in the treatment of saprophytic forms of pulmonary aspergillosis. *Am. Rev. Respir. Dis.*, 109, 57-62.
4. Schaffner, A. and Annette, B. (1993): Amphotericin B refractory aspergillosis after itraconazole: evidence for significant antagonism. *Mycoses*, 36, 421-424.
5. Popp, I. A., White, H. M. and Armstrong, D. (1999): Amphotericin B with and without itraconazole for invasive aspergillosis: a three-year retrospective study. *Int. J. Infect. Dis.*, 3, 157-160.
6. Pulmonary Aspergilloma Study Group (1997): Multicenter clinical trial of itraconazole in the treatment of pulmonary aspergilloma. *Kekkaku*, 72, 557-564 (in Japanese).
7. Roberts, C. M., Citron, M. K. and Strickland, B. (1987): Intrathoracic aspergilloma: role of CT in diagnosis and treatment. *Radiology*, 165, 123-128.