

# Updated Diagnosis and Treatment Strategy of Invasive Aspergillosis in Paranasal Sinus — our experience of 6 cases —

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Invasive aspergillosis<sup>1)</sup> in paranasal sinuses is not a common disease, in comparison with non-invasive type aspergillosis in paranasal sinuses. This disease entity usually coincides with the immunocompromised hosts such as immunodeficiency patients, the aged patient, and patients with diabetes mellitus. Clinical outcome of these patients is not satisfactory and the prognosis varies in each case, depending on the effects of multidisciplinary treatment such as medication of anti-fungal agents and/or surgical intervention. We have recently experienced six different cases of paranasal sinus aspergillosis extending to the orbit and skull base<sup>2)</sup>. Therefore, clinicopathological feature of this disease entity and clinical course are introduced herein, in order to discuss and upgrade our treatment strategy..

## Case presentation

Each case is introduced as for age and, complication, treatment, and prognosis (Table 1). A patient with leukemia is 41 year-old female, but others are above 70 years old in their age. All of them underwent treatments involving surgical intervention combined with antifungal agents. Although three of them are still alive, other three patients died of disease in spite of such treatments.

A 81 year-old man complaining of right eye pain with visual disturbance, ptosis, exophthalmos, was admitted to our hospital in February 1999. He had a history of chronic pancreatitis but did not have any of immunocompromising diseases such as diabetes mellitus. CT scan and MRI on admission, showed the lesion in right

ethmoid and sphenoid sinuses with right intra-orbital extension. Bony destruction was found at the medial wall of left orbit. The serum level of beta-D-glucan in this patient was remarkably high (80 pg/ml). He underwent the extranasal right ethmoidectomy and sphenoid sinusotomy in emergency. The histopathological diagnosis was aspergillums infection. Despite an intensive systemic administration of antifungal agents (fluconazole), the serum level of beta-D-glucan increased gradually and he died of the intracranial extension of aspergillosis one month later.

More interestingly, we experienced 41-year old female leukemia patient, who had complained of ptosis, visual disturbance, and headache. But she was very fortunate to overcome the aspergillus infection in ethmoid sinus

Table 1 Patient's characteristics

CASE	Age Sex	Location	Complication	Treatment	Prognosis
1	70 M	R Fr. R Eth.	Hypertension	operation & medication	alive
2	81 M	R Eth. L Sphe.	Dedhydration	operation & medication	dead 22 days post-ope
3	84 M	R Max.	Diabetes Mellitus	operation & medication	dead 93 days post-ope
4	75 M	L Sphe.	Arrhythmia	operation & medication	dead 120 days post-ope
5	41 F	L Eth. L Sphe.	AML	operation & Medication	alive
6	78 F	L Max.	Diabetes Mellitus	operation & medication	alive

with intracranial invasion, after she received the pharmaceutical treatment with antifungal agents and endoscopic sinus surgery in left ethmoid and sphenoid sinuses. She is still alive after bone marrow transplantation from her daughter, combined with whole body irradiation at hematology department. The preoperative and postoperative CT and MRI showed findings of left ethmoid sinus and brain abscess (Fig. 1) The fungal infection subsided postoperatively.

Most recently we have experienced a 78 year-old female patient with left maxillary lesion and extending to the surrounding orbital wall (Fig. 2). This patient was diagnosed of severe diabetes mellitus and underwent maxillary sinusotomy, being confirmed of paranasal sinus aspergillosis histopathologically, but since then the clinical symptom of buccal swelling and beta-D-glucan level in serum exacerbated in line with a pause of the pharmaceutical treatment with antifungal agents. Although an intraorbital extension might be anticipated in the nearest future, we have been monitoring the clinical

outcome without a radical operation for the last six months.

To summarize case presentation, we have experienced 6 cases of invasive aspergillosis in paranasal sinuses, extending to the orbit and skull base. It was highly considered that CT scan and MRI were useful to assess the bony destruction and intracranial or intraorbital extension, respectively. The serum level of beta-D-glucan and CRP were also helpful for the diagnosis and monitoring of disease activity before and after various treatments.

### Discussion

Invasive aspergillosis in paranasal sinuses can be a fatal disease<sup>3)</sup>, so that an earliest diagnosis is definitely warranted for aiming a better prognosis. Therefore, clinical course in each patient should be exactly considered, by employing CT scan and MRI with monitoring beta-D-glucan or CRP in sera. In immunocompromised hosts, such as an aged person, diabetes mellitus, or leukemia/lymphoma patients<sup>4)</sup> with chemother-

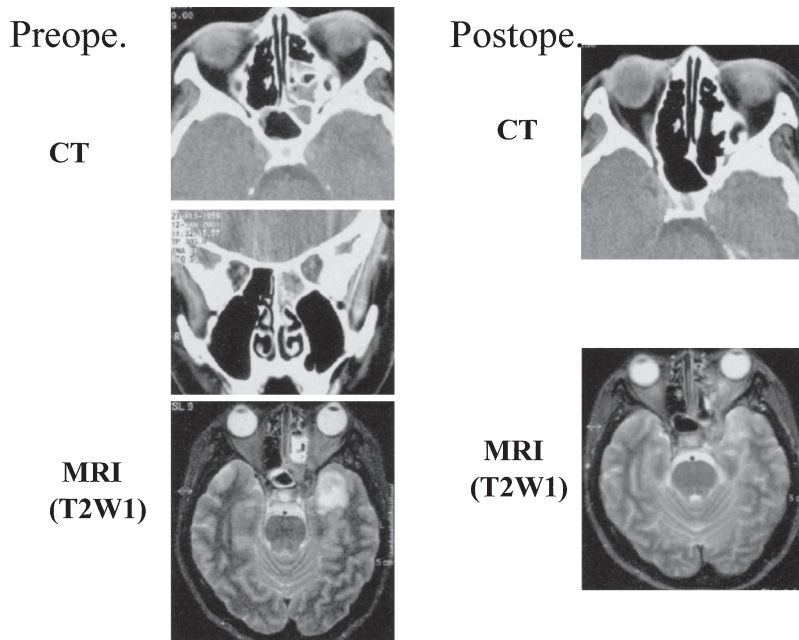
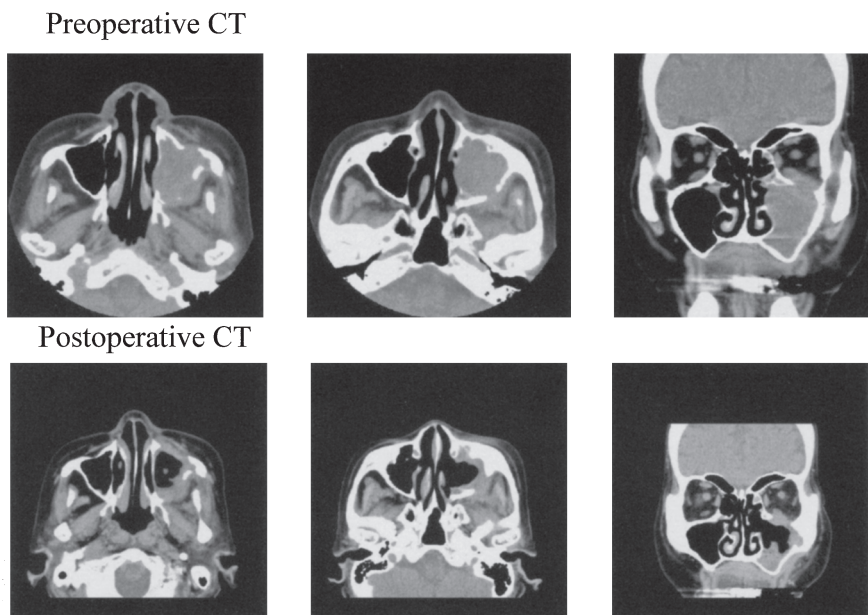


Fig. 1 The preoperative and postoperative CT scan and MRI.

It showed findings of left ethmoid sinus and brain abscess preoperatively. But the fungal infection subsided after she received the pharmaceutical treatment with antifungal agents and endoscopic sinus surgery in left ethmoid and sphenoid sinuses.



**$\beta$ -D-glucan: preoperative 109.6 pg/ml postoperative 18.4 pg/ml**

Fig. 2 The preoperative and postoperative CT scan.

The maxillary sinus lesion was found to be mostly removed but orbital floor inflammatory lesion can be still observed. However, beta-D-glucan level in serum remarkably decreased postoperatively.

apy, a desirable radical surgical intervention is not always permitted, because of poor general conditions. Taking these into account, very much careful attention should be paid for patient's prognosis, even though the minimally invasive surgical removal of fungal lesion under the endoscopic sinus surgery can be considered advantageous as well as pharmaceutical treatment with antifungal agents.

**Conclusion**

Clinical outcome of invasive type paranasal sinus aspergillosis is not satisfactory, especially in immunocompromised patients. In order to improve its prognosis, an earliest diagnosis should be confirmed by CT scan and MRI, and a multidisciplinary treatment should be planned and performed with a surgical intervention combined with a systemic administra-

tion of antifungal agents. Serum level of beta-D-glucan seemed to be very useful indicator for a diagnosis of fungal infection and monitoring the disease activity in clinical courses.

**Reference**

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**質疑応答**

質問 原渕保明 (旭川医大)

破壊型真菌症の場合は、悪性腫瘍と同様な上顎全(亜)摘や眼摘などの広汎な手術が必要と思うが、先生の示した症例ではどうであったか。

応答 川内秀之 (島根大)

78才女性の上顎洞を中心とした破壊型副鼻腔真菌症症例は根本術を施行して鎮静化しているが、眼窩底骨欠損部の残存する病変に対する拡大手術も念頭に入れている。

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