Acute Invasive Fungal Rhinosinusitis: A 15-year experience with 29 patients

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INTRODUCTION

Objectives: 1. To document our 15 year experience with 29 cases of acute invasive fungal rhinosinusitis (AIFS). 2. To evaluate factors predictive of disease clearance and overall survival in this population

Study Design: Case series with chart review

Methods: Patients were identified by review of department billing records between 1995 and 2010. Medical records were reviewed for patient demographics, disease characteristics, clinical course including surgical and medical therapy and treatment outcomes.

Results: 29 patients with AIFS were identified. Causes of immunosuppression included hematologic malignancy (n=16), diabetes (n=10), medication (n=4) and AIDS (n=1). Facial pain and swelling and orbital symptoms were the most common presenting symptoms. Fungal organisms included mucorales (n=18) and aspergillus (n=10) species, with one patient infected with both. Disease-specific survival (DSS) from AIFS was 59%. Intracranial (p=0.01) and ethmoid sinus (p=0.05) involvement were significantly associated with death from AIFS. Cranial neuropathy at presentation (p=0.06), orbital involvement (p=0.07) treatment with amphotericin (p=0.06), an increased number of anatomic subites at presentation (p=0.12) and skull base involvement (p=0.13) trended towards significance. The overall number of procedures performed and treatment with a purely endoscopic approach were not significantly linked with death from AIFS (Table 1).

METHODS

All patients surgically treated for AIFS) between 1995 and 2010 were included in the study.

Patients were identified through department billing records. Medical records were reviewed for patient demographics, clinical presentation, surgical and medical treatment and disease course.

The diagnosis of AIFS was made according to the criteria of an acute clinical time course (<4 weeks) as well as the histologic presence of invasive fungal elements within sinus mucosa, submucosa or bone.

Surgical treatment consisted of both endoscopic and open procedures. The choice of antifungal agents was managed on a case-by-case basis by the Infectious Disease specialists and typically consisted of amphotericin B and/or voriconazole depending upon the organism recovered.

Univariate analysis of prognostic factors with categorical data were performed with Chi squared and Fisher’s exact test where appropriate. Continuous data was analyzed using independent t-tests. Survival analysis was accomplished with the Cox proportional hazards model. Results were considered significant for 2-tailed p values ≤ 0.05.

RESULTS

Overall survival was 21% (6 of 29) at the conclusion of the study. Factors associated with overall survival on univariate analysis included cranial neuropathy at presentation (HR 3.3, 95% CI: 1.3 to 8.2, p=0.02) and intracranial involvement (HR 4.47, 95% CI: 1.51 to 13.22, p=0.01). Orbital involvement (p=0.06), ethmoid sinus involvement (p=0.15), an increased number of subites at presentation (p=0.14) and patient gender (p=0.15) trended toward significance (Table 2). No patient who had orbital or intracranial involvement survived past 6 months, regardless of whether or not they cleared their invasive fungal infection.

DISCUSSION

• Long-term survival in AIFS is poor, despite clearance of infection in a significant percentage of patients.
• Disease extension outside of the paranasal sinuses portended a worse prognosis. Patients with orbital and intracranial extension were less likely to clear their AIFS infection. In the small percentage of patients who had orbital or intracranial involvement and were able to clear their infection, none survived >6 months.
• Within the paranasal sinuses, disease extension into the ethmoid sinuses was associated with a worse prognosis, perhaps reflecting easier access to the orbit and intracranial cavity.
• For long-term survivors of AIFS, the risk of late sinonasal complications appears high. In this series, 40% (2 of 5) of patients who survived >6 months developed frontal sinus mucoceles, highlighting the need for long-term follow-up in this population.

CONCLUSIONS

• The morbidity of aggressive surgical debridement in patients with AIFS should be carefully weighed against the poor prognosis of this patient population, particularly with extension outside of the paranasal sinuses.
• Long-term survivors should be followed closely for late sinonasal complications.