

Nasal Septal Perforation Caused by Invasive Fungal Sinusitis

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Nasal septal perforation presents a distinct challenge to otorhinolaryngologists, and is a problem for patients. Although it has a variety of causes, previous septal surgery is the most common reason. We present a 57-year-old woman who had recurrent chronic sinusitis. A left nasal mass was noted and excised via endoscopic sinus surgery. Invasive aspergillosis sinusitis was proven both grossly and histopathologically, and a nasal septal perforation was also noted during the operation. Although there has been only a single other case presented by Siberry in 1997, we postulate that perforation of the nasal septum as with the case described herein is a rare complication of invasive fungal sinusitis. (*Chang Gung Med J* 2002;25:769-73)

Key words: nasal septal perforation, invasive fungal sinusitis.

Nasal septal perforation presents a distinct challenge to otorhinolaryngologists and patients. There are several causes, and most perforations are related to a history of previous surgery. We report on a rare case of nasal septal perforation which was induced by invasive fungal sinusitis.

CASE REPORT

A 57-year-old woman, with no history of any systemic diseases or nasal trauma, suffered from purulent nasal discharge and post-nasal drip for many years. She received endoscopic sinus surgery in another hospital 2 years ago. According to the copy of the operation and follow-up records provided by the patient, no complication was noted. Unfortunately, she was annoyed by persistent left temporal headache and purulent nasal discharge for about 6 months, and she came to our hospital for further management due to failure of previous medical therapy. Sinoscopy examination revealed a large, reddish, smooth mass which totally occupied her left nasal cavity and obliterated the middle meatus (Fig.

1). Sinus computed tomography (CT) scan showed a large, well-defined, homogeneous mass in the left maxillary sinus with remarkable marginal bony invasion. In addition, it had also eroded the nasal septum and extended to the right nasal cavity through a septal defect (Fig. 2). Under the impression of either



Fig. 1 Sinoscopic examination revealing a large mass occupying the left nasal cavity (arrow).

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Received: Nov. 20, 2001; Accepted: Mar. 5, 2002

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invasive fungal sinusitis or a tumor, we arranged revised endoscopic sinus surgery for this patient. During the operation, plenty of mycolithes and yellowish-green material were drained after incision of the mass, and we created a window in the anterior-inferior portion of the mass which served as a wide drainage pathway. After total excision of the mass, a perforation measuring 1.0 × 1.0 cm in size was found

over the posterior half of the septum, which was compatible with the CT finding and had an irregular surface with erosion of the septal cartilage (Fig. 3). The entire procedure went quite smoothly, and the patient was discharged 2 days later; there were no complications in the follow-up period. The pathology report with special staining proved the diagnosis of aspergillus sinusitis (Fig. 4).

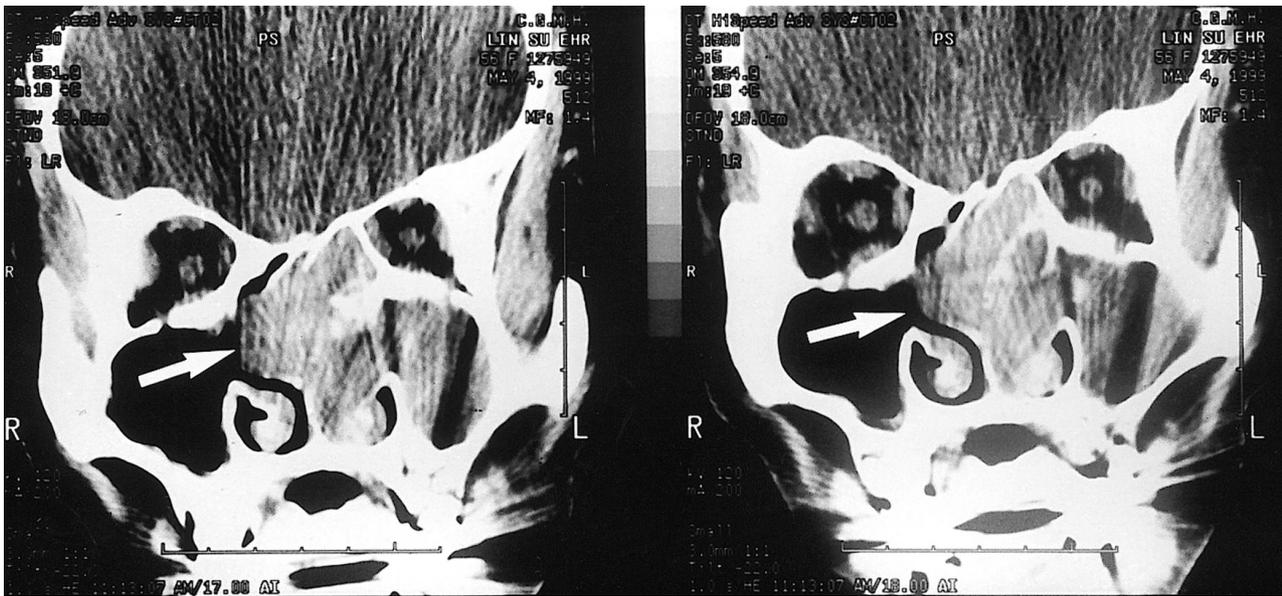


Fig. 2 Sinus CT coronal view: left maxillary sinus mass with extension to the right nasal cavity through a septal defect (arrow).

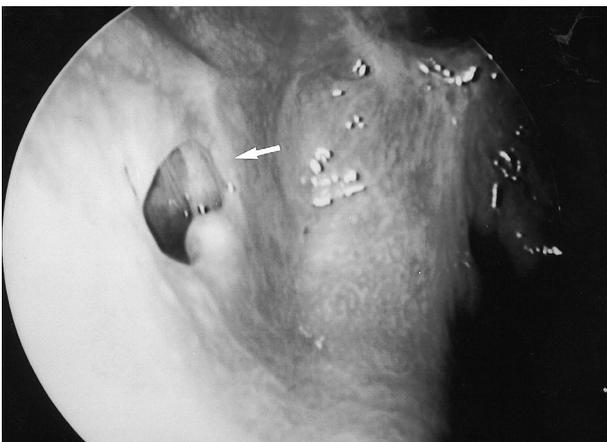


Fig. 3 Nasal perforation (arrow) identified after excision of the mass.

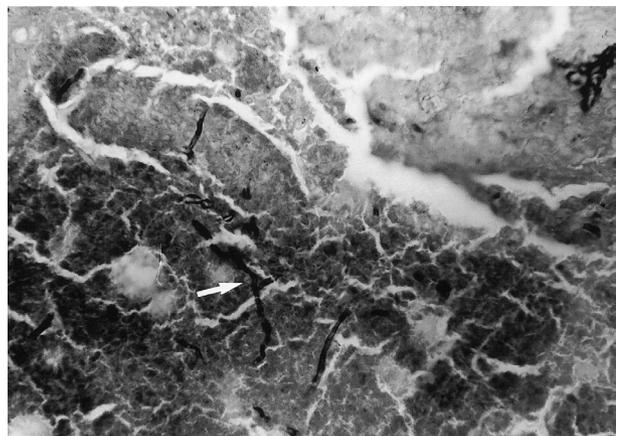


Fig. 4 Specimen examined by special staining. The 45o-branched hyphae (arrow) can be noted, thus confirming the diagnosis of sinus aspergillosis.

DISCUSSION

The most common cause of nasal septal perforations is previous septal surgery.⁽¹⁻³⁾ The incidence of iatrogenic septal perforation ranged from 2.7% (Low and Willatt, 1992) to 9% (Bewarder and Pirsig, 1978) depending on the series and the technique.⁽³⁾ Nasal septal perforations can also occur due to a variety of causes such as traumatic, caustic, or inflammatory processes. Symptoms are usually related to disruption of the normal laminar flow of air through the nasal passages, and crusting, bleeding, whistling, and nasal obstruction may develop. On the other hand, cosmetic problems like dorsal saddling and columellar retraction may be associated with septal perforation due to loss of structural support.⁽⁴⁾

Most perforations are asymptomatic, and only require supportive treatment or maintenance of nasal hygiene; surgical repair is considered only for perforations that have obvious symptoms. Various surgical techniques have been described for the closure of septal perforations, and their success rates are determined by the size, the location of the perforations, and the materials used for the repair.⁽⁴⁻⁸⁾ Many authors reported high closure rates of between 80% and 90%.⁽⁴⁾ Generally speaking, most symptomatic perforations are large in size and involve the anterior portion of the septum; while posterior perforations tend to be less symptomatic because of the rapid humidification of the inspired air by the nasal mucosal lining and the protection of the turbinate.⁽⁷⁾ We did not perform surgical closure in this patient since the perforation was not large, and it was located at the posterior half of the septum. The patient developed no related symptoms in the follow-up period.

Effective management of paranasal sinus aspergillosis requires early diagnosis, histological classification, surgery, and, if appropriate, chemotherapy.⁽⁹⁾ Its nonspecific clinical presentations in immunocompetent patients, such as rhinorrhea, nasal discharge, and post-nasal-drip may be present. Almost all patients have a history of prolonged relapsing sinusitis which is often refractory to standard medical treatment. Examinations of the nose often show nonspecific changes with normal or edematous mucosa, nasal polyps, or a mass on the

lateral wall.⁽⁹⁻¹⁰⁾ A radiological diagnosis of fungal sinusitis on plain X-ray may be difficult, while sinus CT scan plays an important role in determining the extent of the disease prior to further definitive surgery. Once a diagnosis is confirmed, removal of all fungal elements from all involved sinuses can be achieved by surgical clearance. For most immunocompetent cases, surgery alone is always satisfactory; chemotherapy may be added for immunocompromised cases.⁽¹⁰⁾

There are several studies which discuss sinus aspergillosis.⁽¹¹⁻¹³⁾ Depending on mucosal or extramucosal involvement by the fungus, Hartwick classified sinus aspergillosis as saprophytic (aspergilloma and allergic aspergillus sinusitis) and infectious (chronic indolent and invasive fulminant sinusitis). We identified the clinicopathologic presentation of this case as the fulminant (invasive) type of fungal sinusitis.⁽¹¹⁾ This is relatively rare since the patient was not immunocompromised and had no underlying systemic disease history. On the other hand, Shannon depicted the mechanism of the fungal invasion: the aspergillus can differentiate into hyphal forms and produce toxins that destroy epithelial tissues, and penetration of aspergillus into connective and vascular tissue produces thrombosis and ultimately necrosis of hard and soft tissues.⁽¹²⁾ Bony destruction of the sinus wall, intracranial spread, or orbital involvement are not uncommonly seen in invasive fungal sinusitis, while nasal septal perforation can be an extremely rare presentation of this disease entity as in our case. Since the operation notes and follow-up records of the previous sinus surgery mentioned no finding of septal perforation, and sinus CT scan revealed intact residual septal cartilage around the perforation, it was evident that there was no iatrogenic or traumatic damage to the septum. In addition, aspergillus hyphae were found in the specimen obtained from the margin of the perforation. Because of these facts, we postulate that the septal perforation was caused by fungal invasion.

Concerning the pathophysiology of the perforation, we found that the mycetoma extended toward the nasal cavity and contacted the septum through the enlarged maxillary sinus ostium, and that subsequent direct invasion of the fungus might have resulted in the necrotic change of the septum and the perforation which ultimately formed. Meanwhile, the

extensive mycetoma compressed the septal mucosa and led to obstruction of the blood supply of the epithelium, which might also have contributed to damage to the septum.

Invasive fungal sinusitis complicated by perforation of the nasal septum has been reported only for a single case of an immunocompromised 15-year-old boy who suffered from destruction of the nasal septum by aspergillus infection after autologous bone marrow transplantation for acute myeloid leukemia presented by Siberry in 1997.⁽¹⁴⁾

According to the CT scan, the operative and pathological findings, and a review of the past history of this case, we postulate that perforation of the nasal septum is a rare complication of invasive fungal sinusitis.

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