DISCUSSION

Oncologic resection of cancer, trauma, burns, and infectious diseases still remain the major causes of large lip defects. Defects of the lower lip are more frequently encountered. Defects of up to 30% of the transverse width of the lip in adults can typically be closed primarily without significant decrease in oral opening. Defects of the vermilion may require sacrifice of adjacent skin of the prolabium or mentum to allow a vertical realignment of all lip elements without redundancy, and this may be designed as a V or an inverted V for narrow defects. Wider defects may require the skin excess to be resected in a curvilinear alar groove or labiomental pattern allowing the remaining lateral lip or lip-cheek junction to advance medially.[4,6] Full-thickness defects require meticulous attention to obtain a 3-layer closure of mucosa, muscle, and skin. The mucosa must be aligned and everted to provide a watertight mucosal seal. The deep and superficial fibers of the orbicularis muscle must be reapproximated to allow tension-free muscle coaptation and avoid attenuation or muscle dehiscence. Incisions that cross the white roll should be oriented perpendicularly to allow precise realignment of the while roll to avoid a noticeable vermiliocutaneous mismatch or notch. Subtle misalignment of the lip can be aesthetically distracting, even in the absence of significant soft tissue loss.[7] The Karapandzic flap is created by making a curvilinear incision toward the alar base with the width of the flap equal to the height of the defect, and during dissection, the labial arteries and buccal motor nerve branches are identified and preserved, and the flap is rotated and advanced for closure which can be used to resurface up to near-total defects of both the upper and lower lips, though superiorly based flaps for lower lip defects are more common. The key to flap design is to assess the vertical height of the defect and translate that dimension to the width of the flap. This allows a curvilinear incision to be plotted upwards toward the alar base. These incisions can fall within the nasolabial fold or parallel to it with acceptable donor-site scarring. The advantages of this method are that the flap is fully innervated so there is preservation of sensation and motor function, and it can be used to seal large defects with similar, adjacent tissue. Another advantage is that it is a 1-stage procedure.[5,8] The disadvantages are that the lip circumference is reduced and can lead to microstomia, and there is rounding or distortion of the commissures.[5,9,10]

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Fungus Ball in Concha Bullosa: An Unusual Cause of Retro-orbital Pain

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Abstract: Fungus ball in the concha bullosa is an extremely rare disease. We described a case of the fungus ball in the concha bullosa in a 22-year-old woman. Preoperative diagnosis was based on nasal endoscopy and computed tomography scanning. The patient was endoscopically operated on. The examination of the removed material was reported as fungal infection. This case was found worth writing because of the location of the concha bullosa and its rare occurrence in this location.

Key Words: Fungus ball, concha bullosa, endoscopic sinus surgery

Concha bullosa (CB) or pneumatization of the concha is one of the most common variations of the sinonasal anatomy. Fungal infection of the nasal cavity is an extremely rare condition, and similar to this, fungal ball in the CB was reported in only 4 cases previously. The histopathologic changes caused by the diseases that result from the reduced aeration of conchal cavity are frequently found.[1] In this article, we present the fifth fungus ball (FB) case that developed because of *Aureobasidium* species, first isolated within a CB cavity in the literature, presented with retro-orbital pain in a 22-year-old woman. The clinical presentation, endoscopic examination, radiological findings, and management method for this pathology are discussed.

CLINICAL REPORT

A 22-year-old nonsmoker female patient came to our clinic with persistent retro-orbital pain, nasal obstruction, and anosmia complaints.

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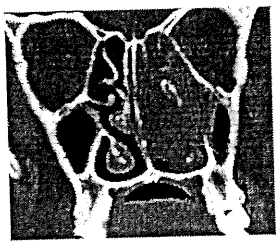


FIGURE 1. Minimal calcifications, no bone erosion sign, and soft tissue density in the CB on CT.



FIGURE 3. Microscopic findings of the specimen showed dark brown arthroconidia-like cells with small hyaline conidia or clustered conidia.

She had experienced these complaints about 6 months ago. She had no notable systemic immune deficiency disease, cancer, radiotherapy, nasal trauma, allergies, or diabetes. She had been treated several times with different medications (local or systemic treatment) but was unhealed. On endoscopic examination, the nasal septum was deviated to the right, the inferior turbinate of the left nasal cavity was hypertrophied, and there was purulent discharge at the nasal floor. Unilateral sinusitis was suspected, and a computed tomography (CT) scan of the paranasal space was obtained. The CT scan (Fig. 1) showed minimal calcifications and soft tissue density in the left CB. There was not any macroscopic bone erosion sign. The patient was operated on endoscopically. The FB was removed completely after resection of the lateral and inferior wall of the CB. The CB cavity was found to be filled with a mass that seems like mucopurulent, cheesy, or clay-like material (Fig. 2). After removal, the FB and overlying bone wall were sent for microscopic evaluation.

On microbiologic evaluation, the sample was cultured on Sabouraud dextrose agar (Plasmatec UK, Bridport, UK) with gentamicin and potato dextrose agar (Oxoid England, Hampshire, UK). Plates were incubated at 30°C temperature. On Sabouraud dextrose agar, colonies were initially white and yeast-like, with aged colonies becoming dark black. On microscopic examination with lactophenol cotton blue, dark brown arthroconidia-like cells were seen with small hyaline conidia or clustered conidia (Fig. 3). As a result of colonial morphology and microscopic evaluation *Aureobasidium* species was defined. Endoscopic control examination 1 month after surgery showed entirely normal bilateral nasal passages with no sign of recurrence.

DISCUSSION

The exact reason of CB is still unknown. There are many acceptable hypotheses about this matter. One prominent hypothesis is the expansion of sinus pneumatization into the turbinate during intrauterine period.[2] The second hypothesis is the fusion abnormality in the intrauterine development. And the third hypothesis is conchal bone microfractures particularly in middle turbinate during late puberty. Concha bullosa is classified into 3 subtypes: vertical lamellar, inferior bulbous, and mixed type. Middle concha pneumatization mainly originates from the anterior ethmoid cells but may be originated from the frontal recess, agger nasi cells, sinus lateralis, posterior ethmoid cells, or directly the middle meatus. This condition is a very common anatomic variation with a reported frequency of 14% % to 53.6% by various studies.[3]



FIGURE 2. The CB cavity was found to be filled with a mass that seems like mucopurulent cheesy or clay-like material in intraoperative appearance.

Diagnostic criteria for the paranasal FB have been described by de Shazo[4]: evidence of sinus opacification with or without calcifications on radiologically; mucopurulent cheesy or clay-like material within the sinus; dense conglomeration of hyphae unattached from the sinus mucosa; nonspecific chronic inflammation of the sinonasal mucosa; no majority of eosinophils, granuloma, or allergic mucin; and no histological sign of fungal invasion of mucosa or bone detected microscopically.[4]

The pathogenesis of middle concha FB remains unknown. Middle concha can be affected by many local factors; this includes bacterial or fungal sinusitis, mucoceles, and polyps.[5] The precise mechanism of spread of fungal infection to CB has been hypothesized that ostial closure of mucociliary transport system of the CB due to inflammation can lead to development of an anaerobic environment for FB.[6] The pathogenesis was not clear, and predisposing local factor was not found in our case. We think chronic inflammation of the nasal passage might lead to destroy the conchal wall, and it seemed to have an important role in trapping fungal spores and providing anaerobic conditions for the development of the FB in the CB cavity. In previous reports, it has been suggested that FBs may develop in any inadequately ventilated sinus in the long term, and they may develop between an iatrogenic nasal passage and CB cavity.[7]

Fungal infections of the nasal and paranasal sinuses are unusual but are being increasingly recognized in recent years.[8] According to the presence or absence of hyphae in adjacent mucosa, fungal sinus infection has been classified in invasive and noninvasive forms. Each group is divided into 2 subgroups, fulminant and chronic group of invasive form and FB and allergic group of noninvasive form.[7]

Clinically, CBFB has nonspecific symptoms such as headache (fronto-orbital, retro-orbital) that usually resolves after surgery, purulent posterior discharge, purulent unilateral anterior rhinorrhea, nocturnal cough, and nasal obstruction.[9]

Computed tomography scan is the keystone of radiological diagnosis of paranasal sinus disease. Fungus ball in sinuses appears as a subtotal or total sinus opacity that is usually heterogeneous.[6] Spontaneous hyperdensities frequently appear within the sinus opacity, due to the content of the FB in iron, manganese, and calcium.[9] Bone thickening and sclerosis of sinus walls are other common findings. Partial bone erosion of sinus walls can rarely be found on CT scan, because FB is not invasive.[10] Bone erosion can be due to the inflammatory process related to the FB and is frequently reversible after removal of the FB.[6] On magnetic resonance imaging, the FB does not enhance after gadolinium administration, but

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inflammatory mucosa generally does. The FB has an isointense to decreased signal intensity on T1 images and a much decreased signal intensity on T2 images (second to magnetic susceptibility of iron and manganese).[9]

Exact diagnosis of CBFB is made by means of microbiological and histopathologic examinations. On culture, the most commonly isolated fungus is *Aspergillus fumigatus*.[6] However, cultures are generally negative, because of the existence of dead fungi within the FB.[10] Diagnosis is made by histopathologic findings that assess the occurrence of fungal hyphae in the concretions. In general, histopathologic examination shows the characteristic tangled and septated fungal hyphae.[6] In our study, colonies were initially white and yeast-like but with age colonies becoming dark black on the Sabouraud dextrose agar. On lactophenol cotton blue, dark brown arthroconidia-like cells were seen with small hyaline conidia or clustered conidia (Fig. 3). On culture, *Aureobasidium* species was isolated for the first time in the literature.

Fungus ball should be treated surgically. Untreated fungal ball in the CB can cause bacterial superinfection, bacterial sinusitis, meningitis, and even brain empyema.[11] Treatment of the FB is surgery, wherein removal of FB and lateral wall of the CB restores its ventilation and drainage. Antifungal treatment should not be recommended for the fungal ball.

In conclusion, the pathogenesis of FB remains unclear. Anamnesis, nasal endoscopic examination, and CT scan are the standard instruments for diagnosis. Magnetic resonance imaging is used for assessment of complications and differential diagnosis. Endoscopic removal of the FB is the correct treatment because it has proven effective and has a low morbidity and recurrence rate. Treatment of this disease is essential because FB can lead to complications in the long term. Definitive diagnosis is made by microbiological and pathological examinations.

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Accurate Movement of Jaw Segment in Virtual 3D Orthognathic Surgery

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Abstract: In traditional virtual 3D orthognathic surgery, after repositioning the maxillary segment to the desired position, surgeons usually roughly rotate or adjust the mandibular segment to obtain a relatively good relationship with maxillary dentition to calculate the virtual terminal occlusion splint. However, surgeons are not easy to avoid penetrability, overlap, or an overly large space existing between the maxillary and mandibular dentitions during this process. The present report offered a new method to obtain a suitable virtual terminal occlusal splint that could avoid penetrability, overlap, or an overly large space between the maxillary and mandibular dentitions, and simultaneously accurately moving the maxillary or mandibular segment to the desired position utilizing the planned terminal occlusion plaster models in virtual orthognathic surgery. For double jaw surgery, after aligning the planned plaster models to the 3D maxilla and mandible, we could simultaneously move the maxillary and mandibular segment as a whole that maintain the planned terminal occlusion to the desired position. This present method may enhance the accuracy of 3D virtual orthognathic surgery and save plenty of time spend on virtual surgery simulation, which also offers a useful educational method for training junior surgeons and students.

Key Words: Virtual 3D orthognathic surgery, planned terminal occlusion, plaster models

Computer-assisted 3-dimensional (3D) virtual orthognathic surgery can improve the accuracy of the surgical plan and help the surgeons to accurately transfer the plan to the actual surgery process.[1,2] Traditionally, in virtual 3D orthognathic surgery, after repositioning

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Fungus ball in concha bullosa: an unusual cause of retro-orbital pain.

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Abstract

Fungus ball in the concha bullosa is an extremely rare disease. We described a case of the fungus ball in the concha bullosa in a 22-year-old woman. Preoperative diagnosis was based on nasal endoscopy and computed tomography scanning. The patient was endoscopically operated on. The examination of the removed material was reported as fungal infection. This case was found worth writing because of the location of the concha bullosa and its rare occurrence in this location.

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