

## A new frontal drainage pathway in a patient with bilateral frontal mucocele

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### Özet

#### Bilateral frontal mukosel olgusunda yeni bir frontal drenaj yolu

Frontal sinüs ve frontal reses anomalileri nadir değildir. Bu anomaliler çoğunlukla unilateral veya bilateral olabilen hipoplazi ve aplaziler, sinüs ostiumunun yokluğu, hiperpnömatizasyon ve çeşitli frontal hücreler (Örn. Agger nasi) şeklindedir. Biz bu olguda bilateral frontal resesi oblitere ve bilateral frontal mukoseli olan, 20 yaşındaki hastada, sol frontal sinüsün mukoselden artakalan kısmını sağ nazal tavana drene eden yeni bir ostium sunulmuştur.

**Anahtar kelimeler:** Frontal sinüs, anomali, mukosel.

### Abstract

Frontal sinus and frontal recess anomalies are not very rare. These include bilateral or unilateral aplasia or hypoplasia, absence of frontal sinus ostium, hyperpnematization and frontal cells (extensive Agger nasi). We reported first case of frontal sinus draining to the contralateral nasal cavity, in a patient with bilateral frontal mucocele.

**Keywords:** Frontal sinus, anomaly, mucocele.

### Introduction

Frontal sinus drains into the anterior part of the middle meatus or frontal recess in a little over half of the cases studied and directly into the anterior part of the infundibulum in the remaining individuals. The ostium is usually located posteromedially in the frontal sinus floor, so often one will also see the posterior wall of the frontal sinus through the ostium (1). Frontal sinus and frontal recess anomalies include bilateral or unilateral aplasia or hypoplasia, hidden unilateral agenesis (or absence of frontal sinus ostium), hyperaeration (or hyperpnematization) and frontal cells (Agger nasi etc) (2-5).

To our best knowledge, accessory frontal sinus ostium or fronto nasal fistula has not previously been reported in English literature.

### Case

A 20-year-old man presented to our clinic with right eye swelling and frontal headache. The symptoms progressively worsened during the last one month. He had a history of maxillofacial trauma in childhood. The patient had been treated conservatively due to suspect of nasal fracture. He had no history of surgical intervention. Physical examination revealed right periorbital swelling and strabismus due to down displacement of right orbit by mucocele. Nasal endoscopic examination revealed an opening toward to frontal sinus in the right nasal roof (Figure 1, 2). A coronal paranasal sinus computed tomography (CT) scan showed mucoceles in both frontal sinuses. Inferior and posterior walls of the both frontal sinuses were eroded by mucocele. Both frontal recesses were obliterated and extended by mucocele. There was a passage between left frontal sinus and right nasal cavity, by-passing left frontal ostium. This passage seems to aerate left frontal sinus from right nasal cavity (Figure 3).

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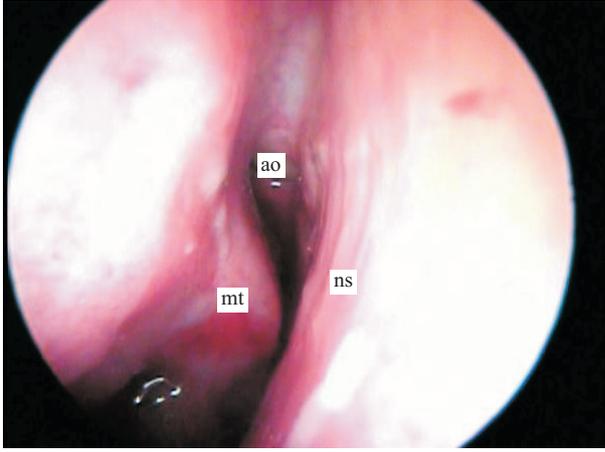


Figure 1: Endoscopic view of right nasal cavity; (ao) accessory ostium, (mt) middle turbinate, (ns) nasal septum

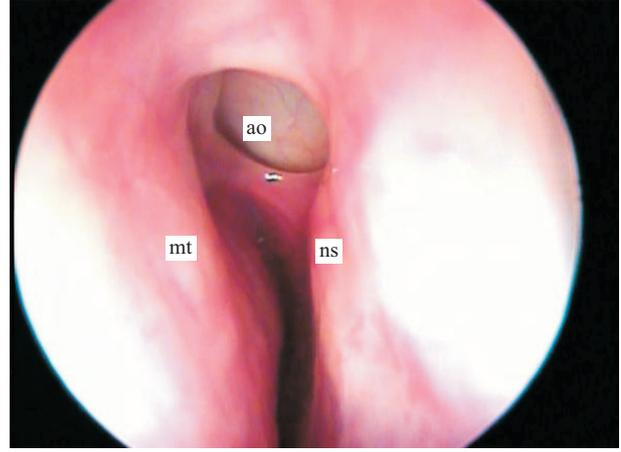


Figure 2: Endoscopic view of right nasal roof; (ao) accessory ostium, (mt) middle turbinate, (ns) nasal septum

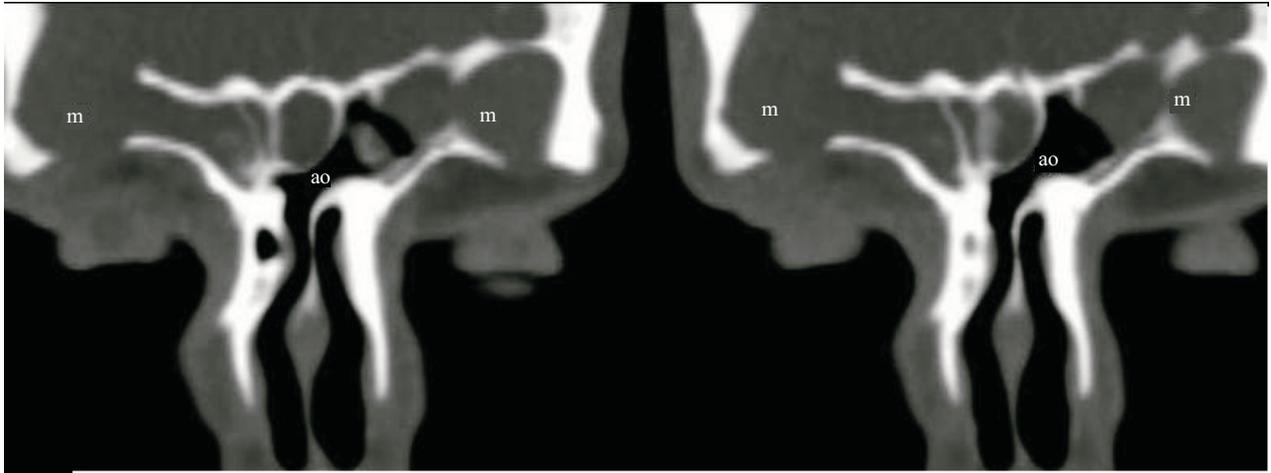


Figure 3: Coronal paranasal sinus CT scan (bone window) showing accessory ostium area; (m) mucocele, (ao) accessory ostium

The mucoceles of bilateral frontal sinuses were managed by endoscopic sinus surgery under local anesthesia. The patient is under follow up for 15 months, and there is neither complication nor recurrence during this period.

### Discussion

Frontal sinus development begins around the fourth or fifth week of gestation, and continues not only during the intrauterine growth period, but also in the postnatal period through puberty and even early adulthood. Primary pneumatization of the frontal bone occurs as a slow process up to the end of the first year of life. After 3 years of age, the frontal sinus may be seen in some CT scans. Significant frontal pneumatization is generally not seen until early adolescence, and continues until the child reaches 18 years of age (2).

The frontal sinus drainage has the most complex and

variable drainage of all paranasal sinuses. Each frontal sinus narrows down to an inferior margin designate the frontal ostium. The frontal ostium extends between the anterior and posterior walls of the frontal sinus, is demarcated by a variably shaped ridge of bone on the anterior wall of the sinus, and is oriented nearly perpendicular to the posterior wall of the sinus. It may be difficult to define when air cells marginate the ostium (6). In our case, the left frontal sinus ostium is narrowed by mucocele. Hereby, the drainage of left frontal sinus seems to be toward right nasal cavity.

The individual variations in origin, position, shape and size are due to constitutional (age, gender, hormones, and craniofacial configuration) and environmental factors (climatic conditions, local inflammations) (7). Present case demonstrates the possible effect of mucocele on the development of

some anomalies.

The mucocele is a chronic, cystic lesion of the paranasal sinuses, which is lined with pseudostratified or low-columnar epithelium containing occasional goblet cells. The increasing size of the mucocele, bony erosion occurs, and the mucocele extends outside the sinus (8). The most common clinically significant mucocele originate in the frontal sinus otherwise bilateral frontal involvement is extremely rare (9). In our case, bilateral frontal sinus mucoceles were operated endoscopically. This new defined anatomic variation may be a cause of mucocele development. Conversely, mucocele may cause this type of new drainage site. However, there is no relationship between mucocele and accessory ostium. This finding makes us to think that mucocele is not the cause of accessory ostium in mentioned case.

The etiology of mucoceles is multifactorial, which involve inflammation, allergy, trauma, anatomic abnormality, surgery and other pathologies such as fibrous dysplasia, osteoma or ossifying fibroma (10). In the present case, there was no anatomic deformation or an old fracture in bone structures. These findings made us to think that neither mucocele nor accessory ostium are the cause of his minimal trauma in childhood. Therefore we think that accessory ostium is a congenital anomaly or due to the development of the sinus. Besides this is the first case of frontal sinus draining to the contralateral nasal cavity.

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