

Olfactory dysfunction caused by superior concha bullosa in a teenager*

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Dear Editor:

A 14-year-old girl complaining of a gradual decrease in her sense of smell over 3 years visited our department; there was no history of head trauma, infection, or prior drug use. Nasal endoscopy revealed no obvious abnormality. T&T olfactometry showed detection and recognition thresholds of 5.8, indicating anosmia. The score for the Open Essence (OE) card-type odor identification test was 4 out of 12. An intravenous olfactory test revealed latency and duration times of 34 and 72 seconds, respectively. Self-Assessment of olfactory dysfunction was performed through a Self-Administered Odor Question (SAOQ). SAOQ score was 25%. VAS score was 26% for odor. Her serum IgE level was 94 IU/ml, and positive for both cedar and cypress.

Computed tomography (CT) revealed narrowing of the olfactory cleft due to a concha bullosa of the superior turbinate (Figure 1). To exclude congenital olfactory dysfunction, the olfactory bulb was evaluated by magnetic resonance imaging and was found to have no abnormality. The gonadal hormone levels were within the normal range (Figure 2).

We suspected conductive olfactory dysfunction and performed decongestion tests of the olfactory cleft. A decrease in the detection and recognition thresholds (3.2/4.0) was found. After consulting the patient's family, we decided to widen the olfactory cleft on the right side. During the surgery, the ethmoid sinus, maxillary sinus, and frontal sinus and the superior concha bullosa were opened. To prevent adhesions, a triamcinolone-coated gelatin sponge was placed in the olfactory cleft (Video 1 – Online only).

Olfactory test scores improved significantly 3 months after the surgery. Both detection and recognition thresholds were 0.6, and the OE score was 7/12. SAOQ and VAS improved to 60% and 90%, respectively. After 5 years, the patient's sense of smell was maintained, with both detection and recognition thresholds

being 0.6 and an 8/12 OE score.

CT revealed that the right olfactory cleft and upper nasal canal were adequately patent (Figure 3).

We observed a case of olfactory dysfunction caused by olfactory cleft narrowing due to a superior concha bullosa. Olfactory test scores improved significantly after the olfactory cleft was widened by surgical removal of the superior concha bullosa. A decongestion test was useful in determining the effectiveness of the surgery.

The superior concha bullosa is an anatomical variant that can



Figure 1. Narrowing of olfactory cleft because of the superior concha bullosa.

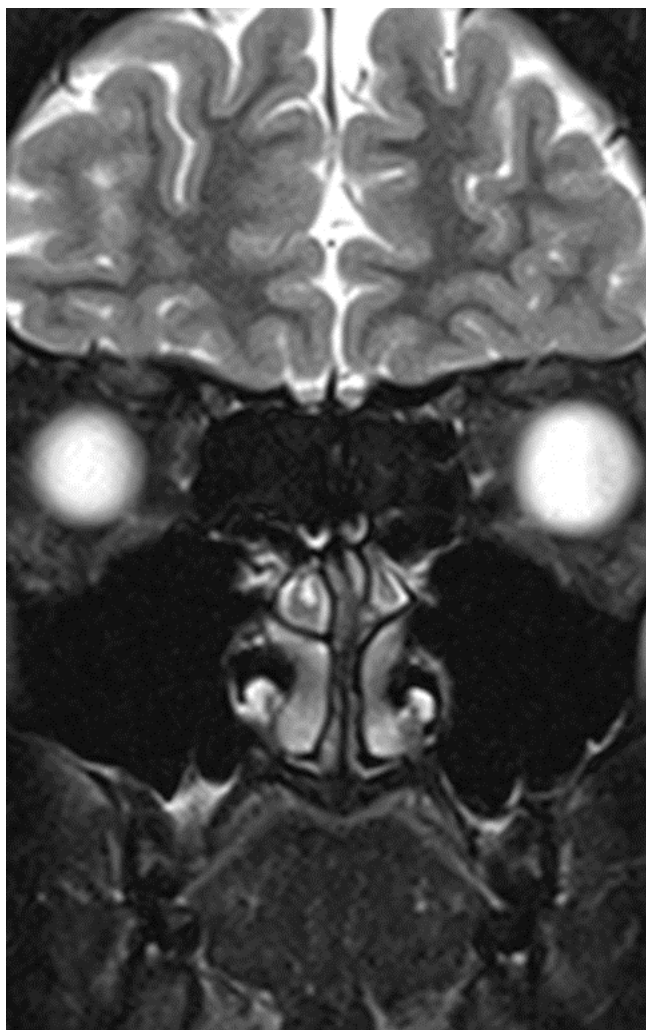


Figure 2. The olfactory bulb, olfactory tubules, and olfactory groove were normal, and there were no signs of inflammation in the sinus.

cause olfactory dysfunction due to narrowing of the olfactory cleft. The incidence of unilateral and bilateral forms of superior concha bullosa is not rare (11.3% and 27.4%, respectively) ⁽¹⁾. However, it is unclear when the superior concha bullosa develops. The most common symptom of superior concha bullosa is headache ⁽²⁾; however, olfactory dysfunction caused by narrow olfactory cleft due to superior concha bullosa has not been reported in children.

It has been reported that the duration of olfactory dysfunction for more than 7 years is a poor prognostic factor for endoscopic sinus surgery ⁽³⁾. Hence, early diagnosis and intervention is necessary to prevent permanent olfactory damage due to a superior concha bullosa.

Olfactory cleftoplasty for anatomical abnormalities, including the middle concha bullosa, reportedly has little effect on the sense of smell ⁽⁴⁾. However, duration of the disease or whether

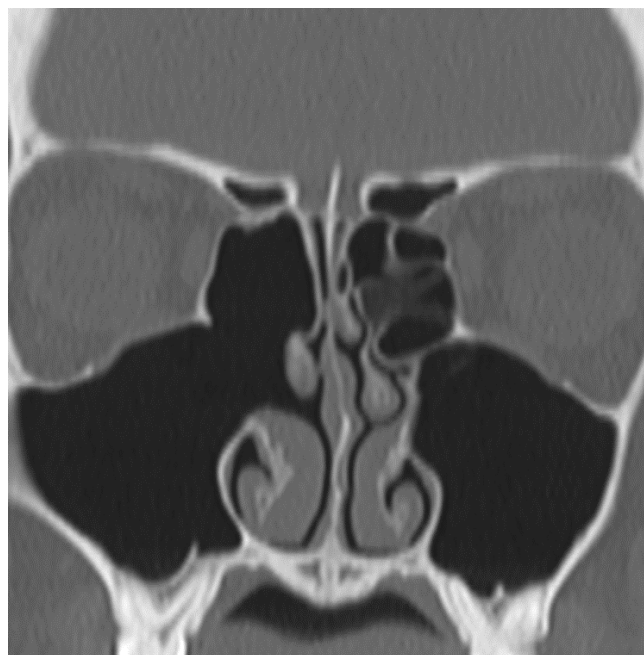


Figure 3. Several years after the surgery, the olfactory cleft is wide open.

the ethmoid sinus has been opened is not specified, it is possible that the olfactory nerve cells have degenerated, or the olfactory cleft has not been sufficiently opened.

Pediatric olfactory dysfunctions include conductive olfactory dysfunction occurring due to olfactory cleft closure caused by the superior concha bullosa, which occurs during the growth of the nasal sinuses. Although surgery in children with anatomical variants requires thorough consideration and the consulting the parents and the child about possible complications of such surgery, otorhinolaryngologists must consider narrowing of the olfactory cleft and opening the space to prevent permanent olfactory dysfunction in children.

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Conflict of interest

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