Chapter3 1. Turbinate Modification

- *Indications*: The turbinates should be examined at the time of the initial examination and then at each subsequent visit in addition to the day of surgery to note any changes in size and character. The three paired turbinates regulate fl ow (primarily the inferior) and humidify (primarily the middle) air within the nose (Figures 31-1 and 31-2). The meatuses that open near the turbinates drain the paranasal sinuses. Hypertrophy of the turbinates may interfere with normal nasal respiration. Chronic irritation and swelling acts in the nose as it does elsewhere in the body. A pattern of edema formation, gland enlargement, and fibrosis leads to hypertrophy of the underlying bone. The lifetime risk of eventual turbinate dysfunction approaches 100% as a person ages, whereas progression to persistent bothersome dysfunction is estimated to be 50%.[1]
- Etiologies of turbinate dysfunction are broad and numerous, including infections, allergies, and/or medications. Management is appropriate when clinical manifestations of turbinate pathology exist. A trial of medical management with steroid and/or antihistamine nasal sprays is a reasonable initial step and should be questioned. Often, this approach is successful for a fi nite period of time but then is less successful. In the instance of medication failure or contraindication, inferior turbinectomy for persistent hypertrophy of bone, mucosa, or both may be indicated. In the patient with concomitant septal deviation, replacing the septum in the midline where it now abuts a hypertrophied turbinate, may produce obstruction that was either present only on the contralateral side or nonexistent. The hypertrophy itself may also interfere with septal repositioning. Preoperatively, examination of the turbinates, especially the inferior turbinate, which is the easiest to visualize, should be performed with a nasal speculum and an adequate light source. Evidence of excessive hypertrophy should be documented.
- *Markings*: No external markings are required.
- *Approach*: Multiple techniques have been employed to address symptomatic turbinate dysfunction.
  - Cauterization with electrical current or cryotherapy with a cold agent have both been described to shrink the nasal mucosa overlying the enlarged turbinate. This may be as easy as applying the tip of the cautery into the turbinate mucosa and allowing the mucosa to coagulate. Newer techniques utilizing one of various lasers may produce less bleeding but may similarly result in recurrence of the hypertrophy.

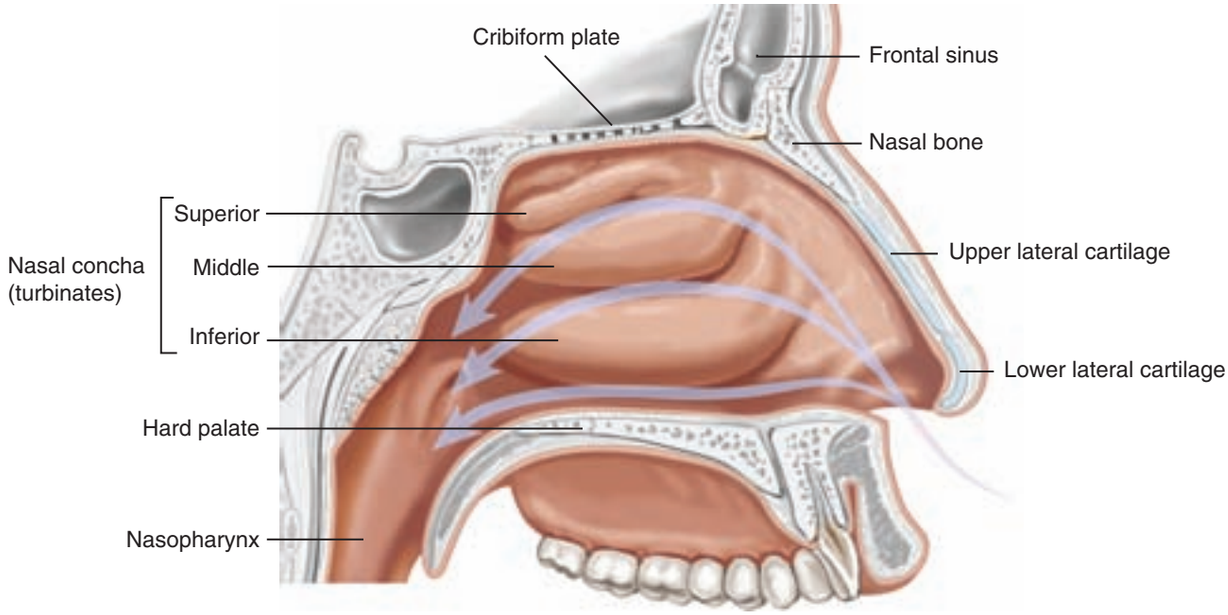

Figure 31-1. Pattern of nasal airflow across the turbinates.

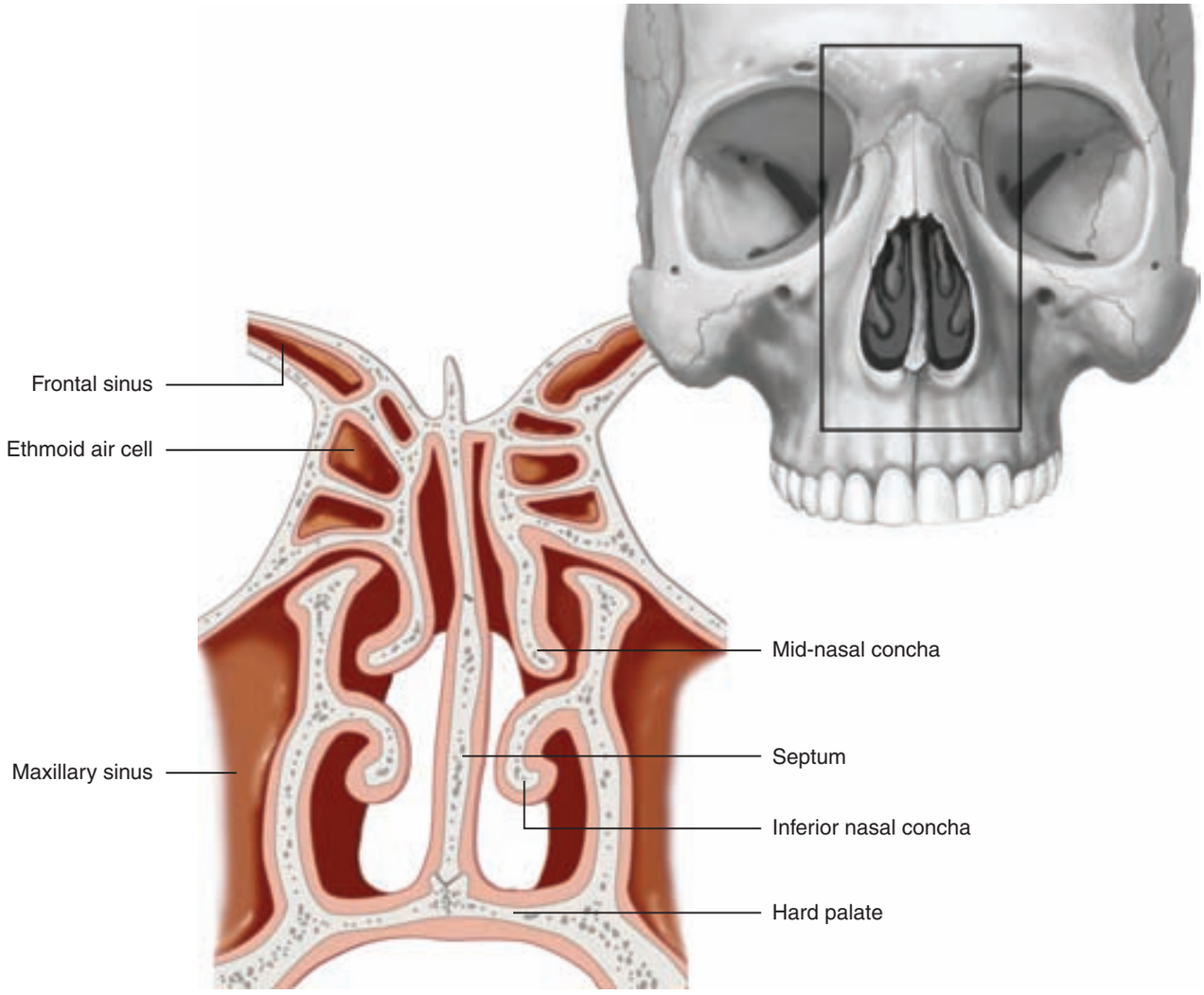

Figure 31-2. Cross-section through the nasal cavity highlighting the positions of the turbinates.

- For mild to moderate hypertrophy, the turbinate may be outfractured away from the septum if the hypertrophy will interfere with septal repositioning (Figure 31-3). This may be combined with any of the above techniques that shrink the nasal mucosa to minimize recurrence.
- For more severe hypertrophy, a portion of the turbinate can be excised (Figure 31-4). To minimize drying of inspired air, a medial mucosa flap is elevated and reflected before the turbinate bone is removed so that it may be preserved and replaced. The bone is then removed with a fine rongeur after which the mucosa is laid back down over the remaining conchal bone (Figure 31-5).
- Some authors have proposed a combination of coblation, which uses radiofrequency energy to ablate hypertrophied tissues, in conjunction with turbinate outfracture to relieve symptoms and maximize the nasal airway patency.[2]

- *Postoperative management*: Vaseline nasal packing can be used to moisturize and promote healing of any raw surfaces. The patient should be on antibiotics to minimize the risk of toxic shock syndrome. Thereafter, saline spray may afford some relief from drying and irritation.
- *Pitfalls*:
  - Lateral nasal osteotomies that impinge on the turbinates may push them too close to the septum and produce an iatrogenic obstruction.
  - The turbinates are highly vascular and can produce significant bleeding.
  - Cauterization may lead to prolonged irritation from scab formation and scab displacement leading to delayed epistaxis.
  - Excessive destruction of turbinate mucosa, especially the middle turbinate, can lead to drying as the ability of the nasal passages to heat and humidify the air is lost.
- *Tips*:
  - The area of nasal bone between the upper and lower lateral cartilages, known as Webster's triangle, should not be violated.
  - Care should be taken to maintain a low-to-low or low-to-moderate path of fracture.
  - Adequate measures should taken in the operating room to ensure that bleeding is controlled, including preoperative infiltration with a vasoconstrictive agent, allowing adequate time for it to work, nasal packing at the conclusion of the procedure, and keeping the patient's head elevated for a period of time postoperatively.

REFERENCES

1. Archer SM. Turbinate dysfunction. *http://www.emedicine.com*. New York, NY. 2006.
2. Wolfswinkel EM, Koshy JC, Kaufman Y, Sharabi SE, Hollier LH Jr, Edmonds JL. A modified technique for inferior turbinate reduction: The integration of coblation technology. *Plast Reconstr Surg*. 2010 Aug;126(2):489–491.

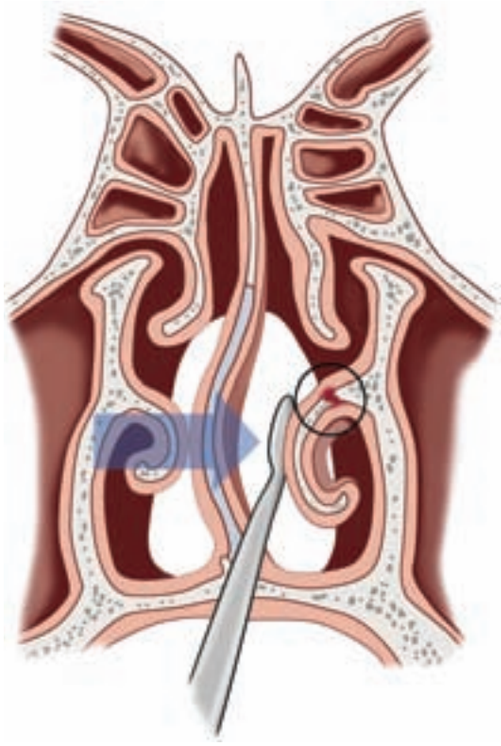

Figure 31-3. Outfracture of inferior nasal concha.

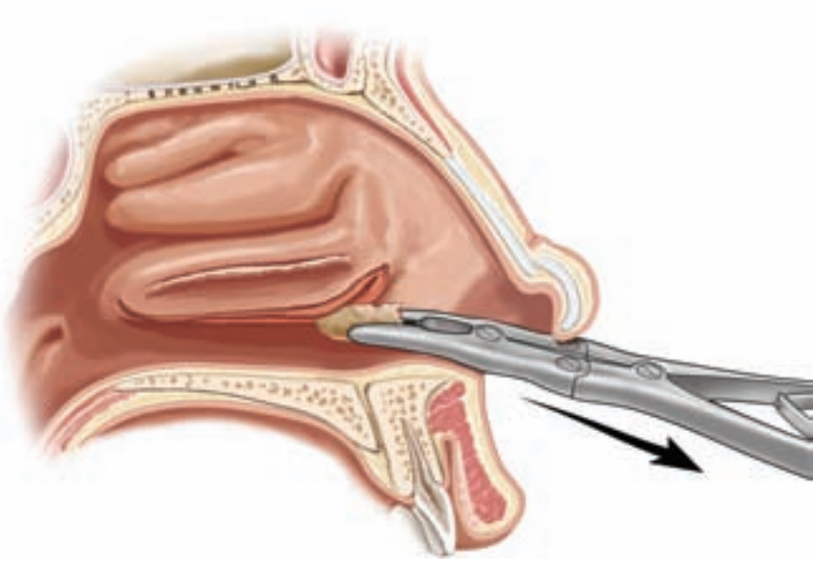

Figure 31-4. Removal of turbinate bone using a rongeur.

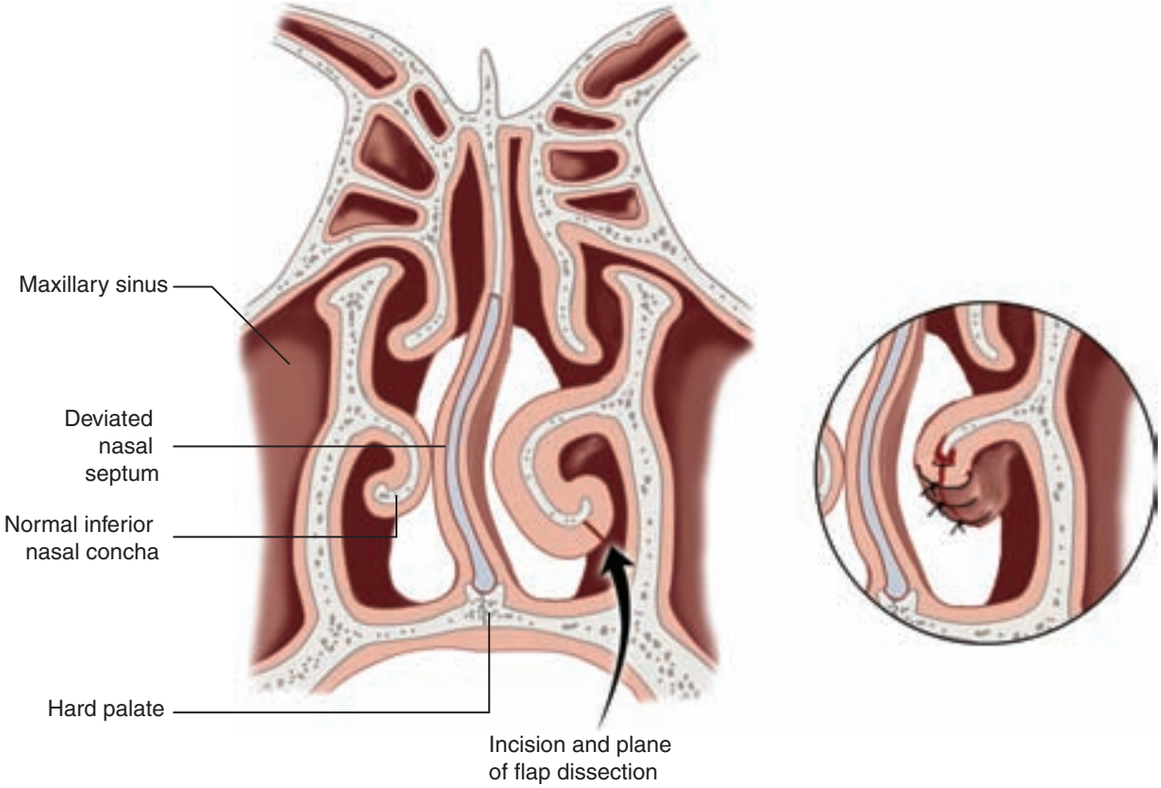

Figure 31-5. Septal deviation in the presence of an enlarged contralateral turbinate. After bone removal, the mucosal flap is re-sutured (inset).