The Concha Bullosa Crusher: a Novel Technique

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Abstract

Objective: To describe a novel technique for treatment of concha bullosa.

Background: There has been debate regarding whether or not concha bullosa requires debridement and removal because of respiratory epithelium within the concha. We describe a new minimally invasive technique of reducing concha bullosa without the need for surgical extirpation with favorable outcomes at one year.

Method: Charts of 4 patients who had this procedure performed were reviewed including endoscopic imaging, CT scans, and operative reports.

Results: After one year follow up, there has been no regrowth of the middle turbinate, no evidence of viable trapped respiratory epithelium within the concha bullosa.

Discussion: While long term outcomes still need to be evaluated, this minimally invasive technique shows promise as a procedure to reduce the size of the middle turbinate.

Introduction

Concha bullosa is a term used to describe an aerated turbinate which most commonly arises in the middle concha. In most patients, this anatomical variant remains asymptomatic and benign. However, this widened middle turbinate is associated with a decreased nasomucociliary clearance rate¹ and obstruction of the osteomeatal complex which can manifest into clinical complications including mucoceles, pyoceles, rhinogenic headaches, and acute or chronic sinusitis.

Since the majority of concha bullosa are discovered incidentally and are asymptomatic, this subset of patients are subsequently treated conservatively with observation. The percentage of cases which do result in the above listed complications or limit exposure during other sinus procedures require intervention. The current accepted management of concha bullosa is surgical resection of the lateral aspect of the concha while maintaining the medial aspect of the turbinate thereby preserving olfactory function.

With the advent of new technologies in endoscopic sinus surgery such as balloon sinuplasties, there has been a shift to performing more minimally invasive procedures thereby minimizing potential complications associated with surgical reduction of the turbinate. Debate remains regarding the necessity of resecting aspects of the concha and removing respiratory epithelium within the concha to prevent mucocele formation and recurrence of the pneumatized turbinate. Our review of 4 cases demonstrate these complications do not arise within one year post procedure.

Case Study #1

18 yo M with chronic sinusitis s/p treatments with antibiotics, oral steroids, nasal steroids and anti histamines. Patient received FESS which included crushing of the concha bullosa, balloon dilatation of the frontal sinuses, maxillary antrostomies, anterior ethmoidectomies, frontal sinusotomy, septoplasty, and inferior turbinate out-fracturing and coblation. The patient did well operatively and continues to breathe well clinically.

Figure 1: (A) Right middle turbinate pre treatment (B) Right middle turbinate post concha crushing (C) Right middle turbinate post medialization. (D) Left middle turbinate pre-treatment (E) Left middle turbinate post concha crushing and medialization

Case Study #2

21 yo F with recurrent acute sinusitis s/p treatments with saline irrigation, antibiotics, oral steroids, and nasal steroids. Patient received FESS which included crushing of the concha bullosa, maxillary sinuses antrostomies with resection of tissue, anterior ethmoidectomies, frontal sinusesotomies, septoplasty, and inferior turbinate out-fracturing and coblation. The patient did very well post operatively and continues to breathe well clinically.

Figure 1: (A) Right middle turbinate pre treatment (B) Right middle turbinate post concha crushing (C) Right middle turbinate post medialization. (D) Left middle turbinate pre-treatment (E) Left middle turbinate post concha crushing and medialization

Methods

Charts of 4 patients who had this procedure performed were reviewed including endoscopic imaging, CT scans, and operative reports.

Technique:

After proper anesthesia was applied, a Jansen-Middleton rongeur was used to crush the pneumatized middle turbinate from inferior to superior. The reduced turbinate is then medialized to provide improve exposure to the middle meatus.

Results

After a one year follow up, there has been no regrowth of the middle turbinate, no evidence of mucocele formation, and no clinical evidence of sinus disease or nasal obstruction.

Discussion

Simply crushing the middle turbinate in patients with concha bullosa shows promise as a potential minimally invasive procedure. Early findings of these reviewed cases showed no evidence of mucocele formation or regrowth of a pneumatized middle turbinate. This is further supported by another study that also followed patients for 2-10 months post-crushing of the pneumatized middle turbinate where no recurrence of concha bullosa was found upon CT imaging². These results are promising since some surgeons believe that crushing the pneumatized turbinate carries less risk of complications. By crushing, one avoids violating mucosa and removing bone thereby minimizing the risk of an unstable turbinate, mental adhesions, and csf leaks which are more commonly associated with more traditional turbinate resections.

On the other hand, it is inconclusive whether the benefits of crushing the concha bullosa are maintained in the long term. While there are no published studies reporting the incidence of recurrence of concha bullosa after crushing, a case series of ten patients with recurrence of a pneumatized concha after crushing did reveal a time range of recurrence to be 2-15 years post procedure. Recurrence was also associated with sinus or nasal obstructive symptoms. Therefore, it is currently unknown whether our patients would go on to develop recurrence of a pneumatized turbinate beyond our one year follow-up. We are continuing to follow 57 patients who had their concha bullosa crushed to further evaluate long term outcomes of the procedure.

Conclusions

Findings from our case reviews demonstrates that crushing the concha bullosa is an effective treatment with favorable short term results with minimal morbidity risk. However, it is inconclusive whether these therapeutic effects are maintained beyond one year. Long term follow-up is needed to further evaluate the efficacy of this procedure.

References