Anatomical Landmark for Endoscopic Maxillary Sinus Surgery

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INTRODUCTION

Even using angled endoscopes, direct visualization of the maxillary sinus natural ostium (MSNO) in an unoperated nose is uncommon because it is usually hidden by the nasal septum and the mucosa. On the other hand, “accessory” maxillary sinus can be identified endoscopically by balloon dilation.

When anterior ethmoid sinus is inflamed, discomfort is common and prevented in 15 and 20° CT reconstructions (60% evidence). One cause of failure in maxillary sinus surgery is the lack of inclusion of the MSNO when performing an anterior or balloon dilation of this region.1,2,3 A critical and important approach for removal of the uncinate is to find the MSNO. With these findings, we have demonstrated that the identification of the MSNO can improve the performance of endoscopic sinus surgery.

METHODS AND MATERIALS

We performed an anatomical and radiological study to analyze the consistency of an anatomical landmark, the “m” line, by performing dissections of 10 cadaver heads (20 sides) and by analysis of virtual 30° (3D) reconstructions of 10 computer tomography (CT) exams (20 sides) of patients with sinonasal inflammatory problems. The dissections were performed by the same surgeons using anatomical instruments and endoscopes (90 and 30° degree). Dissection was done on both sides of each head, removing the uncinate process to expose the natural ostium of the MSNO. A picture was then taken of the dissection with the scope in the usual position for surgery at the MSNO. The picture was then sent using a computer program (Adobe Photoshop CS5) and a virtual horizontal plane was created perpendicular to the nasal lateral wall. A line was then drawn on the image from the most inferior aspect of the ethmoid bulla to the most superior aspect of the maxillary sinus.

RESULTS

The “m” line, a horizontal line drawn from the most inferior aspect of the ethmoid bulla to the maxillary sinus, is slightly superior to the MSNO. In 4 CT 3D reconstructions (40% evidence), the “m” line was slightly superior to the MSNO.

DISCUSSION

Maxillary sinus surgery is often the first important step in endoscopic sinus surgery. When performing traditional endoscopic antrostomy, the uncinate process is removed to expose the ethmoid bulla and the uncinate process to visualize the natural maxillary ostium (MSNO). However, when performing some minimally invasive procedures, such as balloon dilatation, the uncinate process is not removed, which makes it difficult to visualize and locate the ostium. Thus, the “m” line could be useful in avoiding one of the causes of failure of traditional endoscopic maxillary sinus surgery for MSNO and “m” (1,2,3). Furthermore, in cases in which an untreated uncinate process is not removed, this can lead to maxillary sinusitis. Thus, the “m” line could be useful in avoiding this problem. The “m” line could also be used as a reliable anatomical landmark to find the MSNO when performing endoscopic sinus surgery.

CONCLUSIONS

The “m” line may be a reliable anatomical landmark for the MSNO. It can help surgeons to perform the most effective endoscopic sinus surgery, whether using traditional, minimally invasive or uncinate preserving techniques.