UTILITY OF CURRENT SIALENDOSCOPIES IN THE SINONASAL CAVITY

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ABSTRACT

Objectives: 1) To describe the utility of current sialendoscopes in the paranasal sinuses in a cadaveric model. 2) To suggest the novel uses for sialendoscopes and potential improvements in design.

Methods: A cadaveric study was performed in a tertiary care academic setting. Currently available Marchal and Erlangen sialendoscopes were utilized for visualization and interventions in the paranasal sinuses. Four cadaver heads were studied pre- and post-dissection. Outcomes included identification of ostia, cannulation of sinuses, success of mucosal biopsy, and clarity of images.

Results: There were no significant differences in types of scopes. Both Marchal and Erlangen scopes were demonstrated to be effective in both visualizing and cannulating the sphenoid sinuses in pre- and post-dissected settings (8,10). Both types did not allow for adequate visualization of the maxillary ostia without dissection, but did allow for evaluation and cannulation of paranasal sinuses. Larger diameter scopes were associated with the least distortion of image during the assessment of the maxillary sinus. Mucosal biopsy within the sphenoid sinus was possible pre- dissection, but not in the maxillary sinus.

Conclusions: Sialendoscopes can be utilized for visualization and interventions in the sinonasal cavity but are limited mainly to the sphenoid sinus. They may be considered as a minimally-invasive method for drug delivery and/or biopsy in the post-operative setting for all sinuses. The design can be improved somewhat.

INTRODUCTION

Endoscopic evaluation of the nasal sinuses has a long history. The first written account of nasal endoscopy on record is from 1901 when a modified cystoscope was used to visualize the sinuses (1). Since then, endoscopic procedures, based on both rigid, semirigid, and flexible technology, have tremendously expanded the scope and breadth of our specialty. With regards to the paranasal sinuses, endoscopes are routinely used to treat diseases of the sinonasal cavity, and have expanded indications for treatment of midtine anterior and lateral skull base lesions (4,6). Sialendoscopes could be also utilized as a vehicle for drug delivery and/or biopsy in the paranasal sinuses. They may be considered as a minimally-invasive method for drug delivery and/or biopsy in the post-operative setting for all sinuses. The design can be improved somewhat.

METHODS AND MATERIALS

A cadaveric study was performed in a tertiary care academic setting. Four fresh-frozen cadaver heads were studied pre- and post-dissection of the maxillary and sphenoid sinuses. The Marchal 1.3 mm sialendoscope (0.4 mm working channel) and the Erlangen sialendoscopes (1.1 and 1.6 mm, 0.45 and 0.8 mm working channels) were utilized for visualization and interventions in the paranasal sinuses. Flexible grasping forceps with double action jaws for use with the respective sialendoscopes were utilized for mucosal biopsies. Images and video documentation were obtained using a standard Karl-Storz camera and video tower. Light was set to 100%.

Outcomes included identification of ostia, cannulation of sinuses, success of mucosal biopsy, and clarity of images and were graded on a 1-4 scale, with 1 being poor and 4 being excellent. Data were then tabulated.

RESULTS

There are numerous problematic aspects with the performance of surgical paranasal sinus endoscopy that limit its use. Among the most significant of these is the patient discomfort experienced with using the current standard rigid nasal endoscope. While the large直径 and rigid nature of the current endoscopes provide clear images, the interventional sialendoscope may allow for similar utility with increased patient comfort (7,8). This novel cadaveric study was performed to evaluate the potential of the interventional sialendoscope to this end for examination of the sphenoid and maxillary sinuses.

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EXAMINATION OF ERLANGEN AND MARCHAL SCOPES AT THREE DIAMETER SIZES—1.1 mm, 1.3 mm, and 1.6 mm, were evaluated to determine their ability to identify the maxillary sinus ostium, identify the sphenoid sinus ostium, cannulate the maxillary sinus ostium, perform mucosal biopsy, and produce a clear image.

Both Marchal and Erlangen scopes demonstrated efficacy in visualizing and cannulating the the sphenoid sinuses with no appreciable differences among them. These scopes were evaluated and found to be similarly effective in the sphenoid sinus in both pre- and post-dissection settings.

One principal weakness of the tested scopes was the lack of adequate visualization of the maxillary ostia without dissection. We found that this was mitigated by anteroposterior dissection as visualization was possible. Mucosal biopsy within the maxillary sinus was not possible prior to dissection, but this procedure was possible within the sphenoid sinus.

As expected, images of the maxillary ostia were appreciated with the least distortion when using the larger diameter scopes.

CONCLUSIONS

Sialendoscopes can be utilized for visualization and interventions in the sinonasal cavity but are limited mainly to the sphenoid sinus. They may be considered as a minimally-invasive method for drug delivery and/or biopsy in the post-operative setting for all sinuses. The design can be improved somewhat.

REFERENCES