Another Point of View

An Invited Commentary on The Preceding Article by Ibuki, Karnell and Morris

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I would like to thank Dr. Ross for extending to me the opportunity to comment on the article by Ibuki and his colleagues. Nasopharyngoscopy is a relative newcomer to the battery of diagnostic tools for the assessment of VPI. As such, there has been a bit of a lag in data reaching the literature from institutions in which research with the tool has been conducted. We have been utilizing nasopharyngoscopy for slightly over eight years now, and have done well over 3,000 examinations with a variety of nasopharyngoscopes. It is based upon this extensive experience and understanding of the procedure, instrumentation, and velopharyngeal physiology that I would like to offer some comments on the article in question. Though we have published some of our findings, we have not as yet addressed the basic principles of nasopharyngoscopy as we see them here, so this commentary offers us a brief opportunity to share some thoughts with the readership of the journal.

Ibuki et al state that they wish to assess the validity and reliability of nasopharyngoscopy. In attempting this difficult task, they have made two basic errors in procedure. The first error is centered around the choice of equipment. The second and more critical error is based upon an assumption about velopharyngeal physiology and how the endoscope can be used to observe it.

The problems with the instrumentation are several. The more basic problem is the selection of the endoscope, a side-viewing flexible fiber optic instrument. The overwhelming majority of flexible fiber optic endoscopes being used to view the pharynx are end-viewing (or forward looking), not side viewing. Therefore, showing the reliability of an instrument which is hardly used for its intended purpose would seem to be of limited value. Ibuki et al do not address the issue of why they chose this particular instrument or what its particular properties are which would be advantageous. In fact, in a recent publication, Pigott and Makepeace (1982) in comparing several types of endoscopes found the side-viewing flexible scope to have several properties which made its application to studying the velopharyngeal sphincter limited. For one thing, this particular scope has the smallest viewing field (or cone of acceptance). Therefore, in order to see the entire velopharyngeal portal within the field of the endoscope, it must be positioned far above the plane of closure, thus potentially dissipating light. When light saturation is reduced, information is lost. This may also be responsible for the exposure problems encountered by Ibuki et al as mentioned on page 12. Pigott and Makepeace (1982) also illustrated how flexing the tip of the endoscope up or down can alter the view of velopharyngeal closure sufficiently to provide misleading data. Such adjustments in angulation were apparently made by Ibuki et al, but were not discussed in terms of how they could affect the observation of velopharyngeal valving (page 9). I have personally used both side-viewing and end-viewing flexible endoscopes (as well as side-viewing rigid endoscopes) and I have chosen the end-viewing flexible instrument for routine use for a variety of reasons. In comparing the instrumentation available, one must consider optical properties, ease of examination, and the ability to see the physiology of velopharyngeal closure most effectively. While no single instrument is ideal, in my experience, the end-viewing flexible endoscope is clearly the superior instrument and the the side-viewing flexible instrument is the least valuable. The advantage of the side-viewing rigid scope

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(Storz-Hopkins) is the superior optical quality. The image is crystal clear and the field of view is extremely wide. Its disadvantage is its rigidity, for two reasons, one obvious, the other not. First, examination is difficult because even with surface anesthesia, many patients will experience pain or marked discomfort. Second, the rigid endoscope, even with optimal positioning, can only observe movements occuring from a point of constriction between the velum and pharynx and above. It can not be passed into the velopharyngeal sphincter, below the point of maximal velar elevation. This would lead one to conclude that the movements of the lateral pharyngeal walls observed at this plane of constriction and above are **the** movements, or the **maximal movements** of the lateral walls. In our use of the end-viewing flexible instrument, we have learned the value of passing the scope deep into the velopharyngeal portal during phonation. By so doing, we have learned that the full movements of the lateral walls usually do not occur at this uppermost plane, but rather well below the velar eminence, as does Passavant's ridge, when present. When any endoscope, side-viewing or end-viewing, is positioned above the level of the velar eminence, it is extremely difficult if not impossible to observe the full extent of lateral wall movement or a Passavant's ridge. We first realized this when we found that our endoscopies (at that time we were using the Storz-Hopkins system) were often not in agreement with our multi-view videofluoroscopies of the same patients. The frontal views were showing more lateral wall movement than the endoscopic examinations in over 30% of the patients. When we began using flexible endoscopes, we used both the side-viewing and end-viewing instruments. The side-viewing instrument had none of the advantages of the rigid scope (the optics were poor by comparison to the Storz-Hopkins) and the viewing position yielded numerous errors. When we began using the end-viewing Machida scope, we soon learned that by passing the scope in and out of the port, we got a better appreciation of the physiology and fewer disagreements between endoscopy and fluoroscopy. We are now firmly convinced that velopharyngeal closure occurs not only in the horizontal plane, but also over the full vertical area of the nasopharynx and oropharynx. No side-viewing instrument can assess the vertical extent of valving. Therefore, though the data collected from subject-to-subject may be replicable, they can not be construed as valid. In my opinion, the choice of the side-viewing flexible instrument for this study is perplexingly inappropriate.

Furthermore, because frontal view fluoroscopy was not utilized in the study of Ibuki et al, the inadequacy of the instrument could not be determined. The use of lateral view could only confirm the position of the endoscope in the vertical plane. It could not show any physiologic discrepancy between the radiographic and endoscopic data.

Finally, the use of still photographs for analysis further removes another value of endoscopy—motion. Using still pictures as a means of assessing validity for a procedure which has as a major advantage the ability to view the physiology of velopharyngeal closure during connected speech seems incongruous. I personally find that when single frames or still pictures of endoscopic studies are taken out of the context of motion, it is difficult to know exactly at what you are looking. This is the same argument provided by those scientists who decry the use of cephalometrics to assess velopharyngeal function.

The second weakness I mentioned above was the basic assumption of the authors as stated on page 6:

> **There are some problems, however, in using endoscopy for assessing velopharyngeal function that have not been addressed. One example is the question of whether there is such variance from one placement to another that different views of the mechanism are obtained.**

Because the authors present this as a problem does not in fact mean that it is a problem. As I discussed above, it is the very maneuverability of the fiber optic instrument that is its advantage. By keeping the endoscope in one place, whether on a single placement or on multiple or repeated placements, the complicated process of velopharyngeal closure (i.e. the appreciation of both the horizontal and vertical relationships) loses its complexity. Only the horizontal relationships are seen. While in a research sense validity and reliability can be shown, in the true sense, such statistical tests are responding to incomplete information. Validity is a test of **relevance.**

The article of Ibuki et al shows relevance to the experimental design, but not actually to velopharyngeal physiology. It seems to me that we must shake free of the concept of velopharyngeal closure occurring at a discrete place or plane. The pharynx is a muscular tube which can move during speech in numerous ways over both its horizontal and vertical dimensions. In other words, in dealing with velopharyngeal closure, we are not dealing with an **area**, but a **volume**.

I would like to commend the authors for advocating the use of nasopharyngoscopy and for attempting to scientifically show its value. But my criticism stems from their stating of problems which we think do not exist and their judging of the technique by standards which are not really applicable. I do hope that they will continue their research efforts and that my comments serve to stimulate them further.

References

PIGOTT, R. W. and MAKEPEACE, A. P. Some characteristics of endoscopic and radiological systems used in elaboration of the diagnosis of velopharyngeal incompetence. *Br. J. Plast. Surg., 35:* 19–32, 1982.