Editorial

Recording of endoscopy and fluoroscopy of the vocal tract with sound (or its absence): a disappointment

Robert J. Shprintzen,[1] Pablo Antonio Ysunza.[2]

There is an old say: "The devil knows more for being old than for being the devil". One of the advantages of being old and observing clinical practice and clinical research advance is that successful procedures and methods can be selected and put into practice. Indeed, it is possible to define when practices we thought could be used by our peers simply by being reported in the literature have proven to be doubtful hopes that leave us trying to find out what went wrong. Such is the case with imaging procedures of the vocal tract during speech tasks.

The authors of this editorial have more than 80 years of experience with flexible videonasopharyngoscopy (VNP) and multiplanar videofluoroscopy (MPVF) of the vocal tract. Literally, thousands of cases have been carefully analyzed. Over 200 reports have been published in high impact scientific journals and books that directly or indirectly address the use of these imaging procedures for assessing velopharyngeal insufficiency (VPI) and/or voice disorders. Time has afforded us the opportunity to see the application of VNP and MPVF from their beginnings to the current state-of-the-art practice. What we regard at the present time is actually disturbing.

The second author of this editorial was introduced to VNP and MPVF of the vocal tract in 1983, when I had the great opportunity and pleasure to meet my professor and friend Dr. Robert J. Shprintzen, who at that time was the Director of the Craniofacial Center of Albert Einstein College of Medicine in New York City. The endoscopic device in use in those days was just above 3 mm diameter at the tip. MPVF was not digital yet, digital fluoroscopy was globally introduced a few years later.

By the same token, narrow diameter end-viewing pediatric flexible scopes were available a few years later and they were immediately put into everyday practice.

With flexible VNP applicable for assessing speech, voice and swallowing being globally available, the market for the instruments expanded dramatically and improved optics and light carrying characteristics were rapidly developed by several different companies. It should be mentioned that the use of recording the examinations with video was almost simultaneously introduced by the pioneer works of the teams of Piggott and Miyazaki in Bristol and Osaka. Digital storage of MPVF studies was also quickly developed.

[1] President and Chairman of the Board, Virtual Center for Velo-Cardio-Facial Syndrome, USA.
[2] Ian Jackson Craniofacial and Cleft Palate Clinic of Beaumont Hospital Royal Oak, Michigan, Professor of Physical Medicine and Rehabilitation, Oakland University, William Beaumont School of Medicine, USA.

In our experience, the ability to record the examinations and use them for enhancing interdisciplinary discussions by clinical teams dramatically improved diagnostic and treatment techniques.

As a consequence, the complex normal and pathologic speech production mechanisms have become widely appreciated by different clinical disciplines.

MPVF has evolved as much as VNP. Digital imaging has made interpretation much easier and efficient. Recording procedures for MPVF can be performed with a video camera or even a smartphone, although modern clinical institutions already have an automated digital recording system. X-ray films have completely disappeared from modern health care institutions.

In the present time, flexible scopes are an essential tool of every ear, nose and throat physician. High definition video/sound recordings are easily and inexpensively performed. The equipment can be purchased as a package from clinical instrument companies. Also, clinicians knowledgeable about digital recording can perform simple and cheaper adaptations.

Because the information is often used for assessment of speech, voice and swallowing, the synchronous recording of speech and video is an utmost essential need. Nonetheless, many clinicians do not record office endoscopies, or they record video without sound, which makes interpretation extremely difficult or even practically impossible.

Modern computer equipment is the perfect platform for recording endoscopic studies with sound and high-quality digital images (high-definition video with 1080p or higher resolution). Why would it be essential to record endoscopic and fluoroscopic examinations? That the question has to be asked is most disappointing.

Just consider that you have shortness of breath, cough, fever, feeling asthenic and adynamic. You consult with a physician. The doctor diagnoses pneumonia. An imaging procedure is indicated for visualizing the lung fields. The doctor does a fluoroscopy but does not record it or saves a still image.

After some thought you feel that you need to look for a second opinion. The second physician diagnoses a severe allergic reaction and wonders why pneumonia was diagnosed. Thus, copies of the imaging procedure are requested. The first doctor replies that there are no recorded images and assures that there were signs of pneumonia. The second physician is now concerned because of the distinct diagnoses. Should a single verbal report of the imaging procedure be trusted? Obviously, there is no need to ask this question.

Another issue is that when VNP and MPVF are being performed for assessing speech, an appropriate speech sample must be used. The interpretation of these procedures can be variable leading to possible false positive/negative findings affecting diagnosis and perhaps more importantly treatment indications or plan.

When imaging procedures of the vocal tract are not recorded with sound and during an appropriate

repetition of an adequate speech sample, findings become highly questionable.

In previous reports, the reviews of VNP and MPVF by a panel of two or three independent experienced examiners have demonstrated disagreements in over 40% of the cases. It is not until a joint discussion by the clinicians that a useful consensus can be reached.

The inability to review appropriately recorded studies with sound can lead to diagnosis and treatment errors. Not recording with sound imaging procedures that are aimed to assess the vocal

tract during an extremely complex and coordinated mechanism which takes place during speech production is totally unacceptable.

It is time for clinicians to stop performing imaging procedures that cannot be reviewed by more than one examiner. VNP and MPVF studies without video and sound recording are totally obsolete and inadequate. Such procedures are not clinically useful and should not be trusted.