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Preface

Vocal fold paralysis

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Guest Editors

The last two decades have brought about significant changes in the understanding of unilateral vocal fold paralysis (VFP). As this understanding has deepened, the means and methods of clinical assessment have changed and treatment options have multiplied. Our intention for this issue of *Otolaryngologic Clinics of North America* was to review these changes and, more importantly, to critically assess them against clinical evidence whenever possible. In practice, this proved more difficult than we imagined, for the body of evidence surrounding VFP is not uniform; studies are not easily compared with one another. Study populations are different and present variability in etiology and workup, and outcome measures are not standardized. Prospective randomized clinical trials that address VFP, and which form the bedrock of evidence-based medicine, are nearly absent. Finally, all investigation takes place against a natural history that is not as clear as, say, the natural history of idiopathic facial paralysis—there is no equivalent of Pietersen's study [1] in VFP. Despite all these difficulties, the sheer scope of the changes to our clinical conception of VFP warrants a summing up.

A principal change—perhaps worthy of Thomas Kuhn's term *paradigm shift* [2]—has been the dissemination of the notion that a paralyzed vocal fold is only rarely a denervated vocal fold. The vocal fold has a robust tendency for reinnervation, but that reinnervation is often dysfunctional. This includes not only ''crossed'' adductor and abductor innervation but changes in neural organization peripherally and centrally. Patterns of reinnervation

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are central to the question of treatment, and Drs. Zealear and Billante present an elegant exposition of the situation as currently understood, as well as insights into experimental work aimed at eliminating the problem of misdirected reinnervation.

The clinical presentation of VFP has shifted somewhat over the years as different surgical procedures placing the laryngeal nerves at risk are developed, existing techniques are improved, and diagnostic workup of noniatrogenic paralysis changes. The literature is reviewed in detail to update the "epidemiology" of vocal fold paralysis and to examine not only the incidence but the mechanisms of injury in specific circumstances.

Improved knowledge of the causes of VFP has changed the clinical evaluation as well. Drs. Bastian and Richardson present their approach, which stresses a careful but streamlined clinical examination that determines subsequent workup and decisions regarding treatment.

It has become evident that the laryngoscopic appearance of a given case of VFP does not reliably reflect the site of lesion, type of injury, or prognosis; the Wagner-Grossman hypothesis and Semon's Law have virtually disappeared from the discourse. Rather, glottal configuration in VFP is probably a result of multiple factors and a reflection of the denervation-reinnervation process. A detailed understanding of the capabilities of electromyography with respect to diagnosis and prognosis has become necessary not only to apply it to the benefit of the patient but to understand the pathophysiology of VFP and the directions its treatment are likely to take in the future.

Lack of standardized outcomes measures has been one difficulty preventing an integrated assessment of treatment of VFP. The absence of consensus exists in no small part because voice is a multidimensional and ultimately subjective phenomenon that is challenging to characterize. So-called "objective" criteria, such as airflow and acoustic measures, present only part of the picture. Dr. Behrman offers an evaluation of metrics used in VFP within the context of an exhaustive review of the treatment literature and makes a strong case for the adoption of a patient self-rating scale as the primary outcome measure.

Voice therapy has occupied an uncertain but potentially useful place in the treatment of VFP, be it as a primary intervention or as an adjunctive measure after surgical treatment. Dr. Miller summarizes the data as well as her personal experience in order to begin to define a role for behavioral intervention. Most importantly, she identifies large lacunae in the body of evidence toward which future inquiry must be directed.

Although injection medialization has been used to treat VFP since the early years of the twentieth century, the nature of the injected substances has changed repeatedly. Dr. Courey identifies two diverging goals for injection medialization today: the first is to mechanically shift the immobile vocal fold to midline, and the second is to replace missing tissue in or near the vibratory portion of the vocal fold. These have given rise to the use of injectable

substances of differing natures and viscoelastic properties, which he examines in depth, along with relevant anatomy and technique.

Medialization laryngoplasty has become a familiar and widely performed operation since the essentials of the modern procedure were laid down by Isshiki. Nevertheless, it remains a delicate one, and subtleties often distinguish an adequate result from an outstanding one. Dr. Bielamowicz reviews aspects of surgical planning for a primary operation as well as for revision and highlights the small changes that can make big differences.

Both injection and medialization laryngoplasty are mechanical solutions for what is at root a neurologic problem. Reinnervation, which appears to be a more apt solution, is not used as often. With increased understanding of laryngeal neurophysiology and improved microsurgical and neural transfer techniques, that is likely to change. Dr. Paniello reviews rationales and results of efforts at reinnervation as well as the suitability of various nerves for the task. He also provides a look into the future of this promising treatment that is likely to become a more important part of our armamentarium.

The superior laryngeal nerve continues to occupy an uncertain place in the neuropathology of the larynx. Much voice pathology has been attributed to superior laryngeal nerve dysfunction, but the relationship has not often been proved. As a result of diagnostic uncertainty, the clinical aspects, incidence, consequences, and treatment of superior laryngeal nerve paralysis remain poorly understood. Past perspectives on the problem are important, but diagnostic rigor is ultimately even more so in order to define this entity.

Finally, unilateral VFP in the pediatric population has been sparsely addressed in the literature. It has a different etiology and, to some extent, different symptomatology than in adults, and treatment concerns necessarily revolve around considerations of laryngeal growth and long-term complications. Dr. Parikh provides an introduction to the subject, including a review of these aspects.

Our understanding of the entity of VFP has not stopped changing; it continues to evolve. This issue is not a summary of "everything you need to know" but rather more of a milestone along the way. It is our hope that in addition to marking the distance traveled, it will provide a useful reference and, by highlighting gaps in knowledge, a springboard for the rest of the trip.

Our initial goal, as we have said, was to present a critical assessment of knowledge and practice regarding VFP, and it proved more difficult in execution than in conception. If we have succeeded to any extent, it is entirely due to our contributors. We are in their debt for their time, their good grace in the face of our editorial demands, and their expertise. In an environment of expediency for the sake of revenue in medicine, of "good enough" medical care, and of mounting pressure to produce clinical income, this issue stands as a testament of our authors' commitment to taking the time to share their knowledge and skills, and to set the standard for excellent patient care.

We would also like to express our gratitude to our colleagues at our respective institutions who have provided valuable input in the form of countless informal office or operating room conversations on the subject of VFP. We include our residents in this, for, not having been fully indoctrinated into the dogmas of our field, their questions are often the most difficult to answer.

If we have brought this issue together in anything like a timely fashion, credit belongs to Molly Jay, our editor at Elsevier. We thank her for her guidance, her professionalism, and, above all, her impressive composure in the face of difficulties.

Finally, we thank our patients who remind us always that we are treating people with a voice problem rather than simply VFP. When all is said and done, they have taught us as much about VFP as any book.

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