Oral Histories in SENTAC: "The Posterior Cricoid Cartilage Graft"

INTRODUCTION

Figure 1: Dr. Robert "Bob" Ward, MD, Professor of Otolaryngology – Head and Neck Surgery, pediatric otolaryngologist, for New York Medical College.

Dr. Ward was a seminary school graduate. He was a school teacher when he was inspired to a career change by the work of his then girlfriend (now wife), Kenda. She was a nurse and working with pediatric patients, and he would accompany her to fill his time. "As much as one is called to a vocation within the church, I felt that I was called to a new vocation and determined to enter medical school."

1977, he started medical school at Cornell with aspirations to become a pediatrician. But on day two of an "easy" rotation in Otolaryngology, he was scrubbed on a maxillectomy for a 25-year-old woman, and it changed that trajectory.

He completed the Pediatrics Internship, then a General Surgery Internship, then the 3 years in Otolaryngology. There were only three institutions with pediatric otolaryngology fellowships available at that time: Boston, Pittsburg, Philadelphia. So, in 1986, he moved to Boston for fellowship with Gerald Healy, leaving his wife and three daughters in New York City for the year.

EARLY CAREER

In 1987, he started working at Cornell University School of Medicine, assuming the responsibilities of his mentor, Head & Neck Surgeon Dr. Self. This led to tremendous surgical experience with thyroid / endocrine surgery. At more than fifty cases per year, the experience was what is now considered the mandatory case load for thyroid specialty surgeon.

At that time, no one in New York was pediatric fellowship trained. The only other practicing pediatric otolaryngologist was Dr. Robert Ruben, whose clinical focus was not airway surgeries. Lasers and dilation were ruling airway management. Laryngotracheal Reconstruction (LTR)was about 15 years old, done with wired grafts and Teflon® Albouker stents. Dr. Ward then attended the 1992 International Airway Symposium in Cleveland, OH. William Montgomery, MD (Massachusetts Eye and Ear Infirmary) lectured on airway injured, grafts for reconstruction, and a technique with "tiny wire pins to snap in place". This was later published as a case series of twenty-one patients (2004). This inspired Dr. Ward's idea of designing the graft to snap into place without wires, as in the Japanese furniture technique called *Shashimono* or the Amish dovetail joints in woodworking.

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CAREER CONTRIBUTIONS

As was typical of the time, faculty surgeons were expected to be "triple threats" with strengths commanding the spheres of medical education, research, and clinical work. Dr. Ward, working through those contributions developed a novel surgical technique, completed a novel Triologic thesis with animal laboratory studies, developed a patented novel device, and has mentored many students, residents, and fellows. He has also traveled for over twenty years to underserved areas of the world to provide charity cleft lip and palate surgery.

Novel Technique

Dr. Ward Designed the posterior cricoid graft cartilage to snap into place. He started trying to share the information for the technique with a manuscript written for "How I Do It" for *The Laryngoscope*. Ironically, the reviewers were disclosed back then, and this manuscript was reviewed by Robin Cotton, MD, who rejected the manuscript. However in 1998, *Annals of Otology, Rhinology, and Laryngology* published, with practice partner Max April, MD, his case series of 20 subjects using the novel posterior graft technique. Then he presented it at several meetings, whereupon Andy Inglis, MD, picked up the technique and started using it endoscopically, referencing Drs. Ward and April for their work. Concurrently, Jean Michel Triglia, MD was in the US as a fellow, and he spent one month in NYC. He carried the technique home to Marseilles, France, and hence the French surgeons became early adopters of the technique. Then in 2008, the two published with then resident Tali Lando in *Otolaryngology Clinics in North America*; in summary this was now a standard practice in LTR.

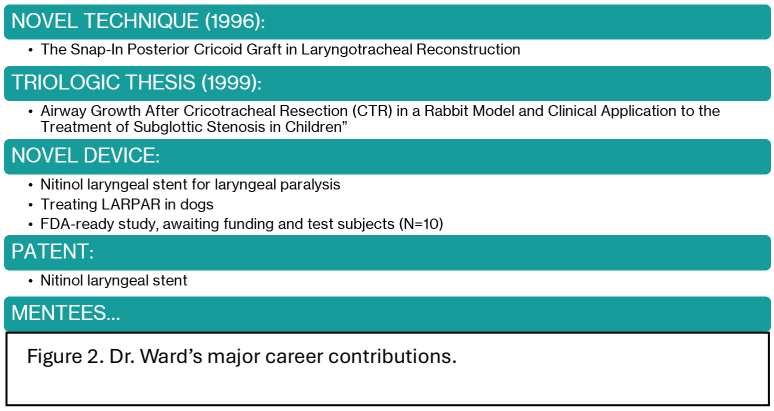

Figure 2. Dr. Ward's major career contributions.

Triologic Thesis

Hermes Grillo, MD of Mass General Hospital (The Grillo Stitch) - a Cardiothoracic surgeon - collaborated with William Montgomery, MD of Mass Eye and Ear Infirmary on cricotracheal resection techniques through the 1970s. This procedure was not used in children due to concern for the risk of growth failure of the tissues. So, Dr. Ward set out to determine if this was true or not. They studied a total of 30 New

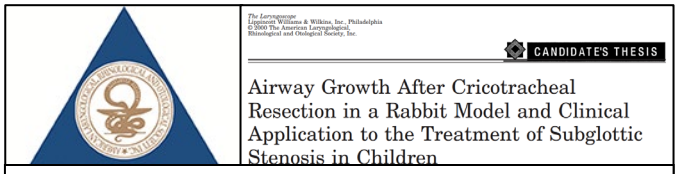

Figure 3. Dr. Ward's Triologic thesis was a study of airway growth in rabbits after cricotracheal resection.

Zealand White Rabbits (N=20 with surgery, 10 without as controls). What is important to know is that though perfectly sized, it is a fragile animal, prone to rapid development of cricoid-level fibrosing stenosis or even sudden death from a loud noise. (One rabbit in the control group did die after a lab noise created a startle.) The work demonstrated that growth with and without surgery was equivalent. (See thesis: "Use a rabbit model to determine growth versus growth failure after cricotracheal resection in consideration of application to infants/children.")

Novel Device and Patent

This began as a collaboration with John Bent, MD, to use nitinol stents in palliation for patients with tracheal cancer. They published as a case report in *International Journal of Pediatric Otolaryngology* in 2002, having use the stents for two children with tracheomalacia/tracheal stenosis. One of Dr. Ward's wealthy patients with a long public voice career with complications of the treatment for squamous cell carcinoma donated $250,000 and asked, why not make one to treat his bilateral vocal cord paralysis; he hated having a tracheostomy. So, he set to work to design the stent and then filed the patent application.

Figure 4: The laryngeal bilateral vocal fold paralysis stent, constructed of nitinol, in position in a dog with LARPAR.

Once designed, it needed testing in the pre-clinical FDA process. Funding sponsored a dog lab at Standford to test its use. For the studies, they would perform surgery to transect the recurrent laryngeal nerves and re-anastomose with stent placement at the same time. One of the university's Lab Veterinarians asked about treating LARPAR, laryngeal paralysis that affects many breeds of pet dogs (200,000 per year) resulting in aspiration and premature death, particularly affected is the beloved Labrador Retriever. Then, through his connections, one of the University of Pennsylvania academic veterinarians started working specifically for this cause, optimizing its use in treating pet dogs with LARPAR. Work remains in limbo due to the constraints of finances, estimated at approximately $1.2million for 10 subjects. However, the project has a pre-authorization for device testing in humans once the animal data supports it.

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MENTORSHIP, SENTAC, and MENTEES

MENTORSHIP

Dr. Ward says his true champion, the single most important Mentor on his journey was Bob Self, MD, who was Chair of Otolaryngology and a Head & Neck Surgeon at Cornell during his formative years. Dr. Self said, "Do your training, and when you return, I'll have a job for you." In 1986 as Dr. Ward was finishing his training, he received a call from Dr. Self, now diagnosed with AML at age 45 years, and sure he would not be there when Dr. Ward would return. He then passed away, leaving a void in partnership and guidance as Dr. Ward began his early surgical career. However, Dr. Self had left opportunity that was unmatched by providing the faculty position and a large case load for Dr. Ward's early clinical career.

SENTAC

Dr. Ward was introduced to SENTAC by Gerald Healy, MD and Robert Reuben, MD. It was 1987, the beginning of his faculty career. At the time, Dr. Healy was heavily involved with the cultivation and growth of ASPO, and he felt strongly that SENTAC would be an important part of the pediatric otolaryngologist's practical realm.

Figure 5. Dr. Ward's SENTAC family tree.

MENTEES

There are many students, residents, fellows, international collaborators, traveling surgeons, who have worked with Dr. Ward and would consider him their mentor. However, he named four SENTAC members who highlights as mentee: Eli Grunstein, MD, Tali Lando, MD, Scott Richert, MD, Jean Michel Triglia, MD.

PITFALLS, BARRIERS, and OBSTACLES

Dr. Ward describes his first major barrier to his career development was his academic background. Seminary school was not a classic college education with pre-med prerequisites. So, his response to that was to build a post-baccalaureate year to complete all the pre-requisites. This was unheard of at the time. His academic advisors all told him that there was no chance of getting into medical school. However, his self-determination and perseverance yielded not only acceptance into school but the financial support to make Cornell University School of Medicine reality.

The second major barrier was the early and unanticipated loss of his faculty mentor, Bob Self, MD. Dr. Ward was away at Boston Children's Hospital in fellowship. However, he responded with determination to return to the promised job and carry Dr. Self's torch while career-building. At that time, Pediatric Otolaryngology was still a novel specialty, with only one other in NYC who did not do airway. This created tremendous opportunities for growth, but it did not afford an opportunity for collaboration or guidance. Therefore, he developed a strong collaboration with his clinical practice partner and dedicated his efforts to research and teaching.

The third major obstacle was the Triologic thesis itself. This prestigious opportunity requires two nominators who must propose the candidacy and then must serve as "mentor" to guide the candidate through the process. This includes study design, review of the results, manuscript and revisions reviews, and official endorsement of the final product. The thesis was 120+ pages in length; the study was designed from the outset with a biostatistician (uncommon in that era); the research was monitored by the ethical review board for animal subjects; the study was sponsored; the time used with discretionary time alongside parenting three little girls with a working wife and a clinical career in a private practice. At completion of the project, one of the "mentors" pulled out his support, saying more work was needed before submitting. The other "mentor" said to go "all-in" and submit, move it along, it was complete. So, Dr. Ward proceeded to submission. It was accepted upon first application, and it was published within the year.

Mitigating Academic Frustrations

Dr. Ward says that he had the great fortune to practice at the end of the wave of the ideals in research and clinical support, the importance of teaching, engaging, and completing research. He says that had his career started ten years later, he might not have had the opportunity that would enable his career growth, his medical missionary work, his research interests. People allowed him to carry forward, from supervisors to family members. His capacity for always seeing the potential for the future of each project has illuminated the path forward with each project, even during adversity.

FUTURE DIRECTIONS

PERSONAL

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Dr. Ward credits resident experiences, for himself and for his mentees, to the big, exciting cases that created the necessary exposures to the specialty and also mentorship opportunities. He offers, it is much harder to achieve this now, but it is no less important.

Now 75 years old, Dr. Ward says that his laryngeal stents remain ready for a formal FDA trial in human subjects. “I would like my work and my efforts to have one lasting impact, and if that impact is ultimately to save beloved family pets from LARPAR… then I will know I accomplished something.”

SENTAC

When asked about the future of the field, Dr. Ward says, “Today’s professional clinical careers are driven by demand for RVU generation, absent of the time needed for teaching and for personal career / academic development. I don’t know how to regain that, but it is something that our next generations must demand, for their future.” This is the role for SENTAC.