Sharing the Airway
The Importance of Good Communication Between Anesthesiologist and Surgeon

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KEYWORDS

• Airway surgery • Anesthesia • Anesthesiologist • Hypoxemia

KEY POINTS

- Coexisting pulmonary and cardiac diseases increase susceptibility to the detrimental effects of sympathetic stimulation, hypoxemia, and hypercarbia that may accompany airway procedures. As such, they should be thoroughly investigated and optimally managed preoperatively.
- Airway surgery often requires the use of alternative ventilatory strategies, including jet ventilation modes, use of ventilating rigid bronchoscopes, cross-table ventilation, and selective bronchial ventilation. Both anesthesiologist and surgeon must be knowledgeable regarding the use and limitations of these techniques.
- Respiratory insufficiency after airway surgery may result from technical errors, drug effect, intrinsic lung injury, or associated pathologies such as vocal cord dysfunction or tracheomalacia.

INTRODUCTION

The spectacular evolution of airway surgery that took place over the past 75 years would certainly not have occurred without the increasing competence of the anesthesiologists and, most importantly, the improvement in working relationships between anesthesiologists and thoracic surgeons.

While a young surgeon in 1975, one of the authors of this article (JD) was part of a case that illustrates the lack of good relations between surgeon and anesthesiologist, which were often the norm in that era. It was a case of extensive tracheal resection that the authors had elected to do under extracorporeal circulation, mostly because a tracheal prosthesis had to be used to replace the resected segment. At the end of the procedure, the patient could not be weaned off the extracorporeal circuit; the anesthesiologist was arguing that the patient needed more potassium, whereas, on the other hand, the surgeon was arguing that the patient had too much potassium and that some should be removed. After several minutes of forceful discussion between the 2 antagonists, it was elected to bring into the operating room the Director of the surgical division, a general surgeon without experience with this type of work but with excellent judgment. After listening to the arguments, the Director asked that the patient be given a blood transfusion and shortly thereafter, the patient was able to successfully come off bypass!

This article reflects on the importance of the good relationship, including mutual respect, which must prevail between anesthesiologists and surgeons during airway surgery.

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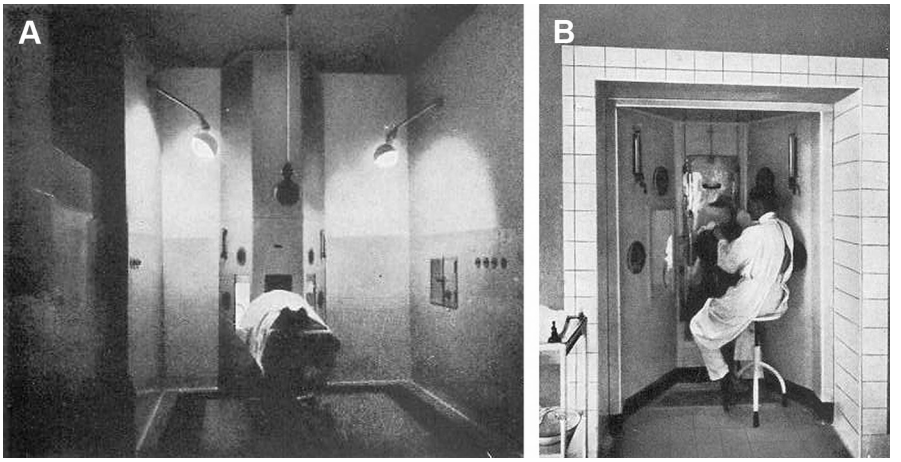

Fig. 1. Historical photographs. (*A*) Inside view of the negative pressure chamber used by Sauerbruch at the Munich University hospital. (*B*) Outside view of the chamber with the anesthesiologist sitting in that area. (*From* Nissen R, Wilson RHL. The problem of actual thoracotomy. Pages in the history of chest surgery. Springfield (IL): Charles C. Thomas; 1960; with permission.)

HISTORICAL PERSPECTIVES

During the eighteenth and nineteenth centuries, the surgical violation of the pleural space was considered hazardous and dangerous, because often associated with significant and generally fatal perturbations of the ventilation and circulation. In 1904, Ernst Ferdinand Sauerbruch (1875–1951), one of the leaders of German thoracic surgery at the beginning of the twentieth century, suggested to convert the operating room in an "enlarged pleural space" with the help of a powerful vacuum system (negative pleural chamber). With this system, the patient's head was outside of the "operating room" and exposed to ambient atmospheric pressure while the rest of his body was inside the chamber and exposed to negative pressures of 8 to 10 mm Hg. One of the problems related to the use of the negative pressure chamber was that the anesthesiologist had to work outside the chamber and was thus unable to communicate with the surgeon (**Fig. 1**). Sauerbruch is indeed often quoted as saying about anesthesia[1]:

> *I refuse to acknowledge that anesthesia might develop into a sub-specialty in its own right.*

Always in 1904, Ludolf Brauer proposed a completely different solution by bringing forward the concept of a "positive pressure chamber." With this system, the head of the patient was inside the chamber while the rest of his body was outside (**Fig. 2**). One of the problems with this system was that the patient had to breathe spontaneously and that the anesthesiologist had little or no access to the airway.[2,3]

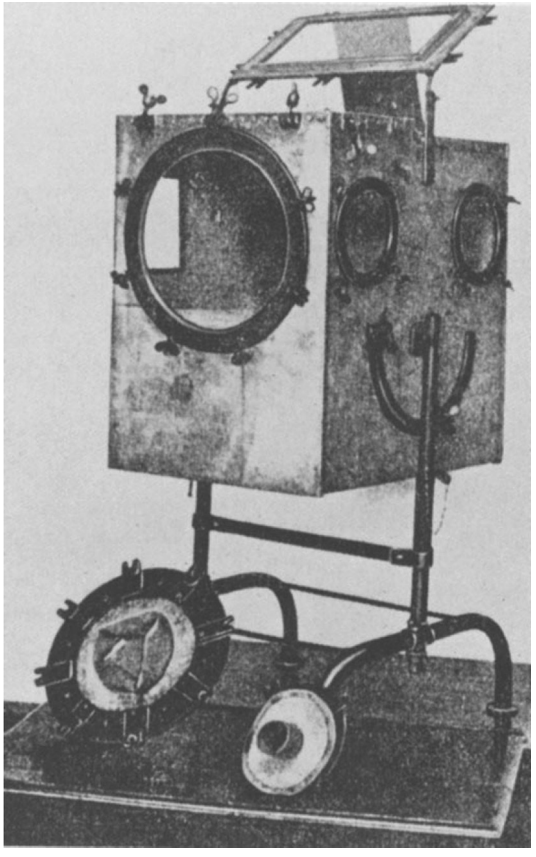

Fig. 2. Historical photograph of the positive pressure chamber as described by Ludolf Brauer. At the top is an area for the patient's head and at the bottom an area for the anesthesiologist's hands. (*From* Nissen R, Wilson RHL. The problem of actual thoracotomy. Pages in the history of chest surgery. Springfield (IL): Charles C. Thomas; 1960; with permission.)