

Minimally-invasive tubeless thoracic surgery constitutes a holistic approach aimed at treating our patients in as gently a fashion as possible by circumventing unnecessary trauma of any kind. This includes avoidance of superfluous catheters—from iv lines to chest tubes and bladder catheters—and even foregoing orotracheal intubation and mechanical ventilation. Aim of this book is to provide a comprehensive overview of current non-intubated and even tubeless concepts and thus improve the delivery of medical care. The road towards tubeless surgery has been long and even arduous, but certainly worthwhile.

Milestones of thoracic surgery, like the first successful complete pneumonectomy by Macewen (1), Heidenhain's (2) and Glück's (3) first lobectomies for bronchiectasis or the initial description of thoracoscopy by Cruise (4), date back more than 130 years. At that time no true consensus on optimal ventilation strategies, patient positioning or secretion controlling existed, all procedures came at an exceptionally high risk for the patient and were usually performed in a staged approach. Improved mortality rates in single-stage lobectomy with complete chest closure and placement of intercostal catheters for secretion drainage were subsequently reported in 1929 by Brunn (3,5). In conjunction with Carlen's (6) invention of the double lumen tube in the 1950s and introduction of rechargeable stapling devices improving on Huelzl and Fischers (7) original design from the 1920 by Androsov (3) during the same period, an era of modern, albeit tube-dependent, thoracic surgery begun.

Relay lenses and fiber optics were first introduced in the 1960ies by Hopkins and Storz (8) respectively, but it took modern video technology to allow Semm (9) to perform the first laparoscopically assisted appendectomy on Sept. 12th 1980, thus effectively starting the era of minimally-invasive surgery. After Roviario's first successful video-assisted thoracoscopic surgery (VATS)-lobectomy in 1992 (10), minimally-invasive thoracic surgery gradually developed into the standard of care. Remembering the teachings of Jacobaeus, who performed thoracoscopic surgery in spontaneously breathing patients since the 1920s (11), non-intubated VATS (niVATS) procedures were gradually (re)-introduced in the late 1990ies. Tschopp presented a series of 98 patients undergoing talc pleurodesis for pneumothorax in 1997 (12), Pompeo published minor procedures under spontaneous ventilation in 2004 (13) and Al-Abdullatif was the first to report major niVATS procedures in 2007 (14). Gonzales-Rivas first uniportal niVATS-lobectomy in 2014 (15) finally sparked major interest in this technique all across the globe, and since then numerous groups reported various successful major niVATS procedures. True tubeless thoracic surgery additionally requires foregoing chest tube placement at the end of a procedure, something routinely done for the past 70 plus years. A systematic approach to avoiding indwelling tubes was first proposed by Nakashima in 2011 (16), and since then a lot of effort has been made to establish entirely tubeless procedures. This currently culminated in an expert consensus on tubeless VATS published in 2019 (17), that incidentally constitutes the first chapter of the book you are about to read. Nowadays tubeless thoracic procedures are a reality and potential backbones of modern enhanced recovery after surgery (ERAS) programs that any dedicated thoracic surgery unit should provide to their patients.

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