

Thoracoscopy one century later: The oldest interventional technique of modern pneumonology, with great future prospects

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Thoracoscopy is the oldest invasive diagnostic method applied in the recent history of pneumonology. One century has passed since 1910, when the Swedish physician Hanz-Christian Jacobaeus thought of inserting a cystoscope into the pleural cavity of patients with tuberculosis in order to lyse adhesions and to induce a therapeutic pneumothorax¹. Since that time, thoracoscopy has been abandoned as a therapeutic approach for tuberculosis, but it has been implemented in the diagnosis and treatment of a variety of pleural disorders. This method was developed in Europe particularly by the German physicians A. Sattler and H.J. Bradt after the Second World War, followed by Robert Loddenkemper in Germany (Berlin) and Christian Boutin in France (Marseille) in the 1980s, who perfected and disseminated their technique. Respiratory physicians who have introduced new refinements to the method are the professors Philippe Astoul in Marseille, Marc Noppen in Brussels, Henri Colt in Los Angeles, Jean-Marie Tshopp in Sierre, Francisco Rodriguez- Panadero in Seville and GianFranco Tassi in Brescia.

Thoracoscopy under local anaesthesia is a simple and safe procedure. It is performed by the respiratory physician in the endoscopy room, with the patient lying in a lateral decubitus position under cardiorespiratory monitoring². The diagnostic accuracy of thoracoscopy in patients with malignant pleural effusions is 95%^{2,3}, while their management with therapeutic talc pleurodesis and pneumothorax during thoracoscopy has an efficacy of 90%⁴ and 95%⁵, respectively. Until recently, thoracoscopy was performed only with a rigid endoscope. In the 1980s, the flexible bronchoscope was first used in patients with pleural effusions of unknown aetiology⁶. Although this type of bronchoscope ensured better access to the mediastinum and diaphragm, one significant disadvantage was the lack of control of the instrument during thoracoscopy and guided biopsy⁶.

At the end of the 1990s and the beginning of the new century a new instrument, the semiflexible (or semirigid or flex-rigid) thoracoscope, was successfully introduced for the management of patients with pleural effusions of unknown cause^{7,8}. This instrument was similar to a bronchoscope and therefore it was thought that it could be accepted by respiratory phy-

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sicians from countries, such as the U.S.A., who reported difficulty in using the rigid thoracoscope. The semirigid thoracoscope is considered to provide a major advance in thoracoscopy, as it allows full visualization of the pleural cavity with the distal flexible section, even at its least approachable sites, whereas its proximal section remains rigid during biopsy sampling^{9,10}. The operative mechanism remains the same as the flexible bronchoscope and it is considered easier to use by respiratory physicians⁹. Although only limited number (eight) of studies have been published regarding the semirigid thoracoscope, these report encouraging results, with an average diagnostic accuracy of 91%. All authors, however, note its inability to take large biopsy specimens, which are considered crucial for the diagnosis of mesothelioma and lung cancer, as its sample needle is the same as that of the flexible bronchoscope⁹. Furthermore, there is difficulty in inspection of the pleural cavity in the presence of adhesions, as their lysis is extremely difficult⁹.

Nowadays, thoracoscopy has become an established procedure in interventional pulmonology and it has a broad spectrum of diagnostic and therapeutic indications. It plays an important role in the staging of non-small cell lung carcinoma with pleuritis, as the documentation of pleural disease renders the patient inoperable due to presence of metastases (stage M1a) and guides treatment and prognosis¹¹. The modern staging of neoplastic diseases requires the use of molecular techniques¹² and biopsy with a rigid thoracoscope can contribute significantly, with the use of molecular markers such as EGFR, mainly due to the adequate number and volume of biopsy material¹³. This also applies for the histological differential diagnosis of mesothelioma into epithelial, sarcomatous or mixed types, which defines the prognosis¹⁴. It is common knowledge that these different histological types of mesothelioma can coexist, therefore a simple paracentesis, or a blind and/or guided biopsy are of lesser diagnostic and prognostic value than the thorascopic biopsy¹⁴.

Apart from its clinical utility, thoracoscopy is considered an important research tool for investigation of various pleural disorders^{10,15}. Fluorescein-enhanced autofluorescence thoracoscopy has contributed in the development of new theories about pleural permeability¹⁶. Recent studies of the pathogenesis of primary spontaneous pneumothorax provide evidence that it is a disorder of the entire pleura (pleural porosity) rather than a localized condition⁵. Newer diagnostic techniques, such as narrow banding imaging, have been used for the recognition of neoangiogenesis in patients with malignant pleuritis¹⁷.

Thoracoscopy makes a significant contribution in the field of molecular research in malignant pleural effusions, and predominantly in lung cancer and mesothelioma¹⁰.

The European Respiratory Society (ERS) has intensified its efforts for the implementation and homogeneity of training programmes in pneumonology, and especially in thoracoscopy, all over Europe. In this setting, two international teaching seminars are organized annually in Europe by the Departments of Respiratory Medicine of the Medical School of the University of Marseille, France and the Medical School of the University of Thrace, Greece, with the aim of training younger pneumonologists from all over the world in this technique. These seminars have contributed significantly to the worldwide expansion of thoracoscopy. More information and enrolment details are available from the ERS on the site <http://dev.ersnet.org/431-courses-2008.htm>. To celebrate the first hundred years of thoracoscopy in 2010, a series of seminars is being held under the name of "The Jacobaeus Day" in several European cities with a long tradition in the technique, such as Sierre, Switzerland (100 years of thoracoscopy: towards new horizons, February 18-20, Prof. Jean-Marie Tschopp), Cremona, Italy (Thoracoscopy over a century later, May 7, Dr. Gianfranco Tassi), Alexandroupolis and Marseille, as well as a round table in the forthcoming ERS convention in Barcelona.

In the 100 years of its application, thoracoscopy, the oldest interventional technique in Respiratory Medicine, has become an important diagnostic and therapeutic tool for pulmonologists, mainly in the management of patients with pleural effusions. Future advances in technology are expected to broaden its applications as a research tool in pleural disorders. For these reasons, training in thoracoscopy should be considered equally as essential for residents in Respiratory Medicine as bronchoscopy.

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