



Pulmonology

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Further information, URLs

Erbe Website	www.erbe-med.com
Microsite	https://cryo.erbe-med.com/
Erbeplus academy / Further education	https://de.erbe-med.com/de-en/education/
Videos on pulmonology	www.medical-videos.com
Apps of Erbe Elektromedizin GmbH in the Apple App store	https://itunes.apple.com/de/developer/erbe-elektromedizin-gmbh/id642728983



Publication overview

Erbe technology in pulmonology

Cryosurgery

ENDOBONCHIAL BIOPSY

Hetzel J, Eberhardt R, Herth FJF et al. Cryobiopsy increases the diagnostic yield of endobronchial biopsy: a multicentre trial. *Eur Respir J* 2012; 39: 685–690

The study compares cryobiopsy with forceps biopsy in 593 patients. At 95 %, the diagnostic yield for endobronchial cryobiopsies is significantly superior to the diagnostic yield of 85.1 % for endobronchial forceps biopsies. No bleeding or minor bleeding was reported more frequently with cryobiopsies than with forceps biopsies, severe bleeding did not occur more frequently with cryobiopsies.

TRANSBRONCHIAL BIOPSIES

Raghu G, Remy-Jardin M, Myers JL et al. Diagnosis of Idiopathic Pulmonary Fibrosis. An Official ATS/ERS/JRS/ALAT Clinical Practice Guideline. *Am J Respir Crit Care Med* 2018; 198: e44-e68

Cryobiopsy has a diagnostic yield of 80 % for IPF, which could enable 80 % surgical biopsies for the diagnosis of IPF to be avoided. Conversely, the diagnostic yield of flexible forceps biopsies is merely 36.1 % for IPF. Surgical biopsies have a diagnostic yield of 89 %. The procedural mortality rate is 0.2 % for transbronchial cryobiopsies and 1.7 % for surgical lung biopsies. No recommendation was issued for or against forceps biopsies or cryobiopsies for the diagnosis of IPF.

Hetzel J, Maldonado F, Ravaglia C et al. Transbronchial Cryobiopsies for the Diagnosis of Diffuse Parenchymal Lung Diseases: Expert Statement from the Cryobiopsy Working Group on Safety and Utility and a Call for Standardization of the Procedure. *Respiration* 2018; 95: 188–200

In addition to latest information, the authors describe a possible procedure for the performance of transbronchial cryobiopsies. The article includes the recommendation of fluoroscopic guidance and a summary of the most frequently used methods, such as intubation, and the preference for or prophylactic use of a Fogarty balloon.

RECANALIZATION

Yilmaz A, Aktaş Z, Alici IO et al. Cryorecanalization: keys to success. *Surgical Endoscopy* 2012; 26: 2969–2974

Successful cryorecanalization was achieved in 72.5 % of 40 patients with stenosis. The restenosis rate was 12.8 %.

Schumann C, Hetzel M, Babiak AJ et al. Endobronchial tumor debulking with a flexible cryoprobe for immediate treatment of malignant stenosis. *J Thorac Cardiovasc Surg* 2010; 139: 997–1000

Retrospective study that included 225 patients. Successful cryorecanalization of tumors of various types was achieved in 91.1 % of cases.

Hetzel M, Hetzel J, Schumann C et al. Cryorecanalization: a new approach for the immediate management of acute airway obstruction. *J Thorac Cardiovasc Surg* 2004; 127: 1427–1431

Cryorecanalization/extraction enables the effective, safe, and economical treatment of endobronchial stenoses. 83% of the stenosis in 60 patients could be recanalized partially (22%) or completely (61%).

REMOVAL OF FOREIGN BODIES, BLOOD CLOTS AND MUCOUS PLUGS

Sriratanaviriyakul N, Lam F, Morrissey BM, et al. Safety and Clinical Utility of Flexible Bronchoscopic Cryoextraction in Patients With Non-neoplasm Tracheobronchial Obstruction: A Retrospective Chart Review. *J Bronchology Interv Pulmonol*. 2015 Oct;22(4):288-93

A total of 38 cryoextractions were performed in 30 patients. The indications for extraction included blood clots (26), mucous plugs (6), foreign bodies (4), and plastic bronchitis (2). Extraction was successful in 84.2 % of cases; in 24/26 (92 %) for blood clots, 4/6 (66.67 %) for mucous plugs, 2/4 (50 %) for foreign bodies, and 2/2 (100 %) for plastic bronchitis. There was only one complication (hypotony) related to sedation. The authors consider cryoextraction to be safe and effective.

Rubio E, Gupta P, le S, Boyd M. Cryoextraction: A novel approach to remove aspirated chewing gum. *Ann Thorac Med*. 2013 Jan;8(1):58-9

An aspirated chewing gum was successfully extracted using a cryoprobe without complications and risks to the patient. The authors determined, that apparently all materials that contain water, can be extracted with the cryo technology.

Schumann C, Kropf C, Rudiger S et al. Removal of an aspirated foreign body with a flexible cryoprobe. *Respir Care* 2010; 55: 1097–1099

An aspirated gold tooth was successfully extracted from the bronchus intermedius using a cryoprobe without complications and risks to the patient.

DEVITALIZATION

Lee S-H, Choi W-J, Sung S-W et al. Endoscopic cryotherapy of lung and bronchial tumors: a systematic review. *Korean J Intern Med* 2011; 26: 137–144

This systematic review evaluated the safety and efficacy of cryodevitalization. In total, 16 publications were included in the final assessment. Improved breathing was achieved with cryodevitalization in approximately 80 % of cases with a complication rate of 0 %–11 %. The authors found cryodevitalization to be a safe and effective procedure.

Electrosurgery

RECANALIZATION

Ernst A, Silvestri GA, Johnstone D. Interventional pulmonary procedures: Guidelines from the American College of Chest Physicians. *Chest* 2003; 123: 1693–1717

These ATS Guidelines describe various methods for the treatment of exophytic tumors. Tumor recanalization with electrosurgery is considered a cost-effective procedure. In particular, the authors emphasize the need to keep the oxygen concentration within the airways as low as possible (<40%).

Tremblay A, Marquette C-H. Endobronchial electrocautery and argon plasma coagulation: a practical approach. *Can Respir J* 2004; 11: 305–310

This review covers the application of coagulation probes, needle knives, hot biopsy forceps, and APC probes for the treatment of malignant airway obstructions. The reviewed studies found successful treatment of malignant airway obstructions in 53% to 100% of cases.

HEMOSTASIS

Tremblay A, Marquette C-H. Endobronchial electrocautery and argon plasma coagulation: a practical approach. *Can Respir J* 2004; 11: 305–310

Bleeding is quickly controlled with contact coagulation.

APC

RECANALIZATION

Morice RC, Ece T, Ece F et al. Endobronchial argon plasma coagulation for treatment of hemoptysis and neoplastic airway obstruction. *Chest* 2001; 119: 781–787

Improvement in the symptoms that occurred before recanalization was achieved in 98% (59/60) of cases. There were no complications related to APC.

Reichle G, Freitag L, Kullmann HJ et al. Argon plasma coagulation in bronchology: a new method – alternative or complementary? *Pneumologie* 2000; 54: 508–51

The reviewed data revealed successful recanalizations in 67% of cases with an additional 29%, in which a minor reopening of the airways was possible.

DEVITALIZATION

Bolliger CT, Sutedja TG, Strausz J et al. Therapeutic bronchoscopy with immediate effect: laser, electrocautery, argon plasma coagulation and stents. *Eur Respir J* 2006; 27: 1258–1271

This article describes the treatment of superficial squamous cell carcinoma with only a few cell layers. One of the advantages described is the ability to quickly ablate large areas with low penetration depth.

Jin F, Mu D, Xie Y et al. Application of bronchoscopic argon plasma coagulation in the treatment of tumorous endobronchial tuberculosis: Historical controlled trial. *J Thorac Cardiovasc Surg* 2013; 145: 1650–1653

The treatment of tumorous endobronchial tuberculosis with APC was 100% successful in combination with chemotherapy. The success rate was 85% in the chemotherapy group without APC. The APC group experienced more rapid disease remission.

HEMOSTASIS

Reichle G, Freitag L, Kullmann HJ et al. Argon plasma coagulation in bronchology: a new method – alternative or complementary? *Pneumologie* 2000; 54: 508–51

Reichle et al. describe successful control of bleeding in 118 out of 119 patients with the flexible as well as the rigid technique.

Morice RC, Ece T, Ece F et al. Endobronchial argon plasma coagulation for treatment of hemoptysis and neoplastic airway obstruction. *Chest* 2001; 119: 781–787

Morice et al. treated hemoptysis (coughing up blood) in a group of 56 patients with 100% successful bleeding control for a follow-up period of up to 97 days. One of the success factors for patient selection: Bleeding should occur in the central lung region accessible with the bronchoscope.

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