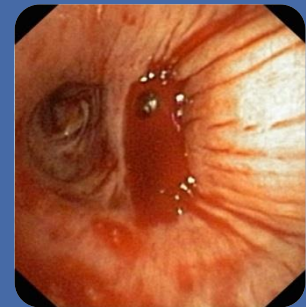


Endobronchial treatment and follow up of malignant central airway obstruction

New frontiers in endoscopy– 14. April 2016

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Central Airway Obstruction

- **Indications for Intervention**
- **Methods**
- **Follow up**
- **Future Perspectives**

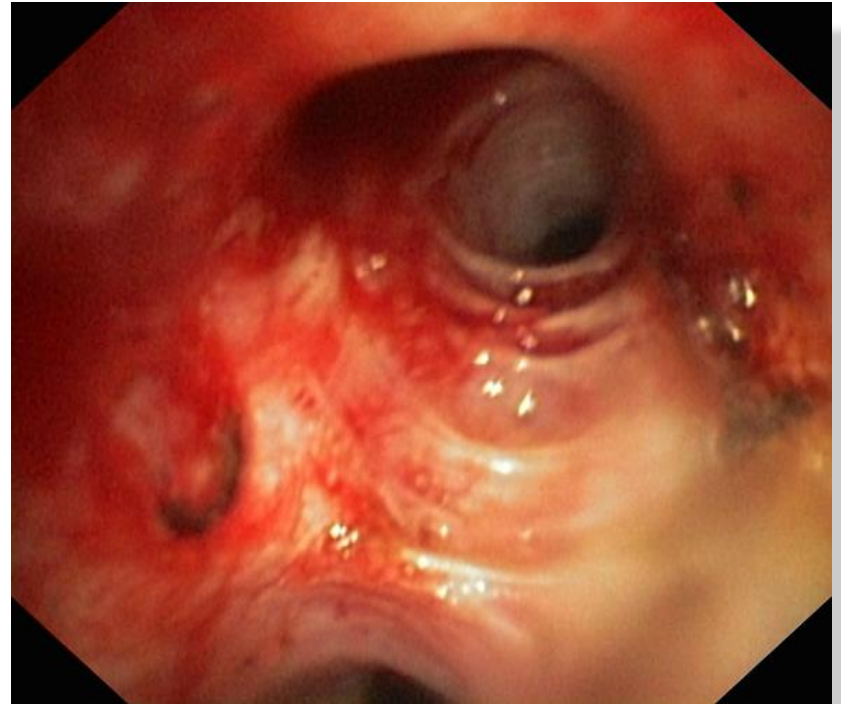
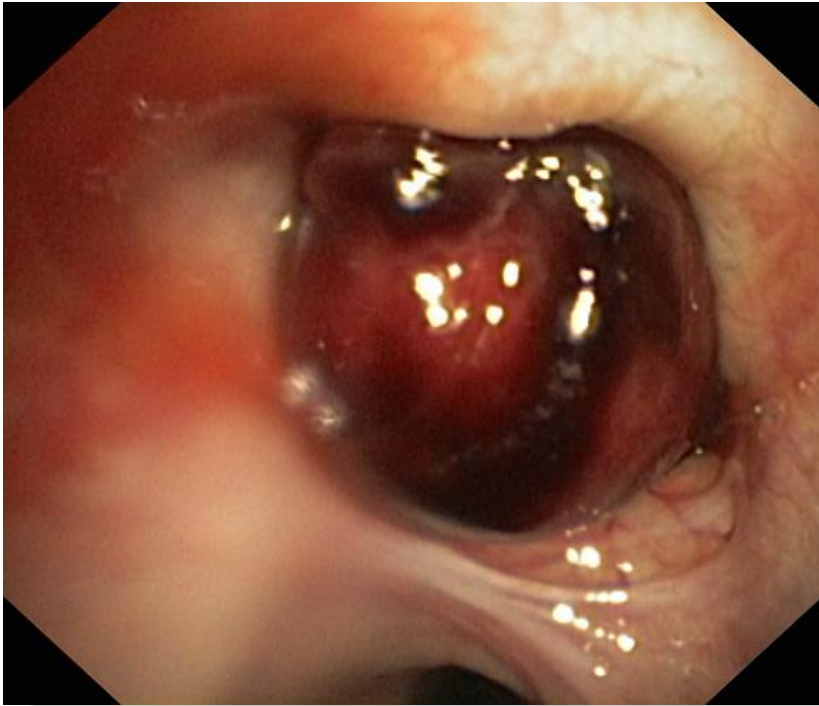


Lung Carcinoma

- **5-Year survival rate <20%**
- **Curative resection <30%**
- **30% present with central airway obstruction**
- **Symptoms**
 - Dyspnea
 - Infections
 - Hemoptysis



Central Airway Obstruction

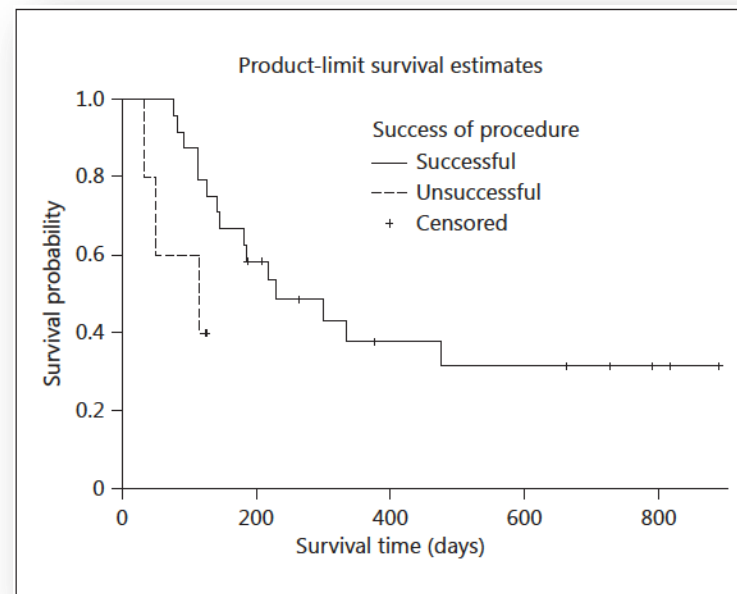
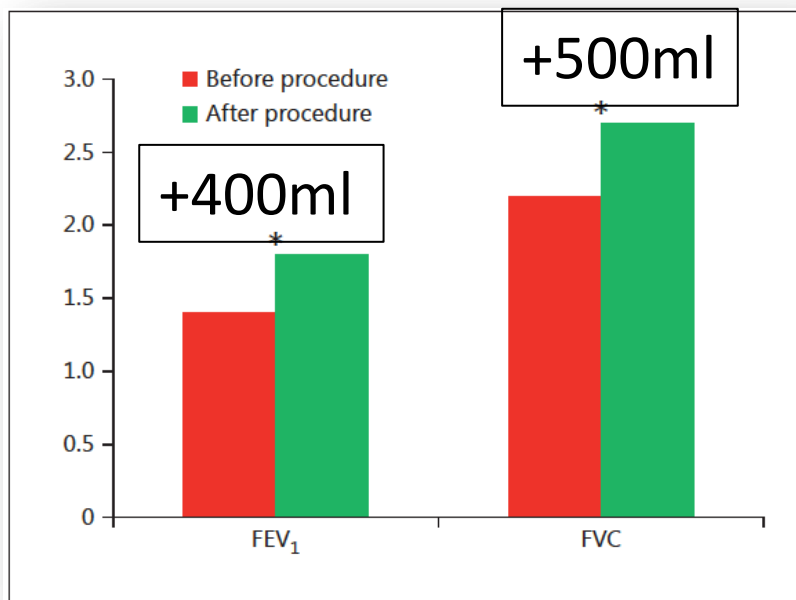


Central Airway Obstruction

- n=53, 58y, 29m/24f
- Prospective study
- 24 malignant, 29 benign Stenosis (many post LuTx)
- 40 Stents (19 SEMS, 10 Silicon, 11, Hybrid)
- Balloon-Dilatation, HF, APC, Laser, Debridement
- Lung function, SOBQ and SF-36 before and 6-8 weeks after Intervention



Central Airway Obstruction



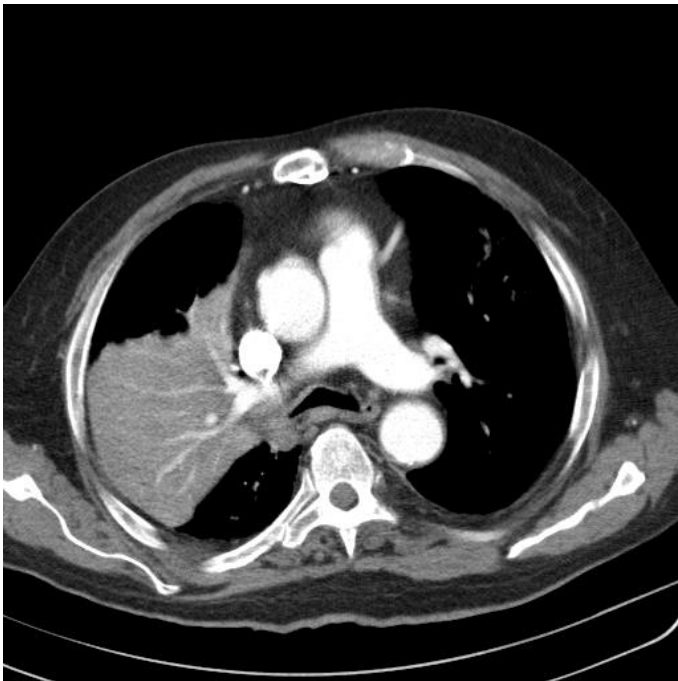
Significant Improvement

- Lung Function
- Dyspnea (SOBQ 55.8 to 37.9)
- Quality of Life

Successful intervention of malignant Stenosis

- Improvement of Survival

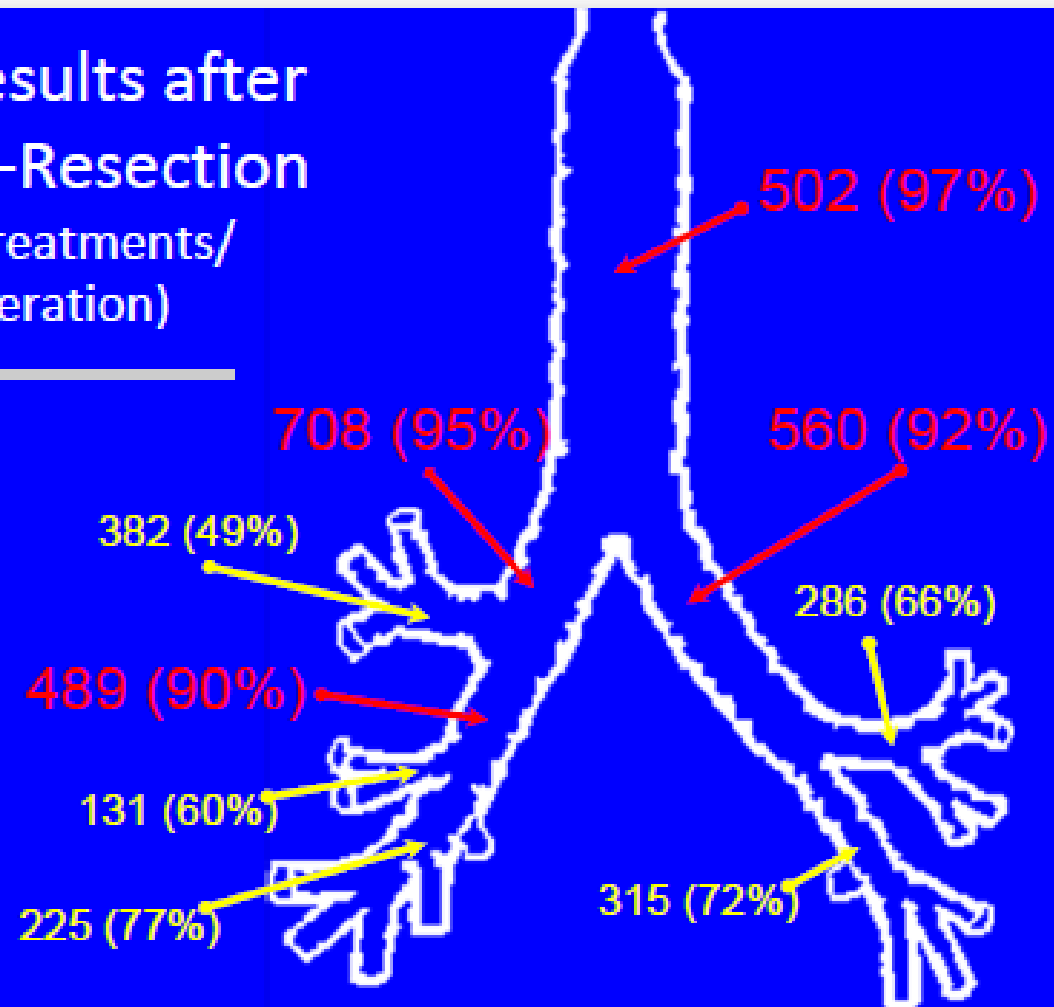
Indication of Intervention?



- Symptomatic stenosis?
- Secretion retention?
- Viable lung tissue?
- Oncologic Concept?

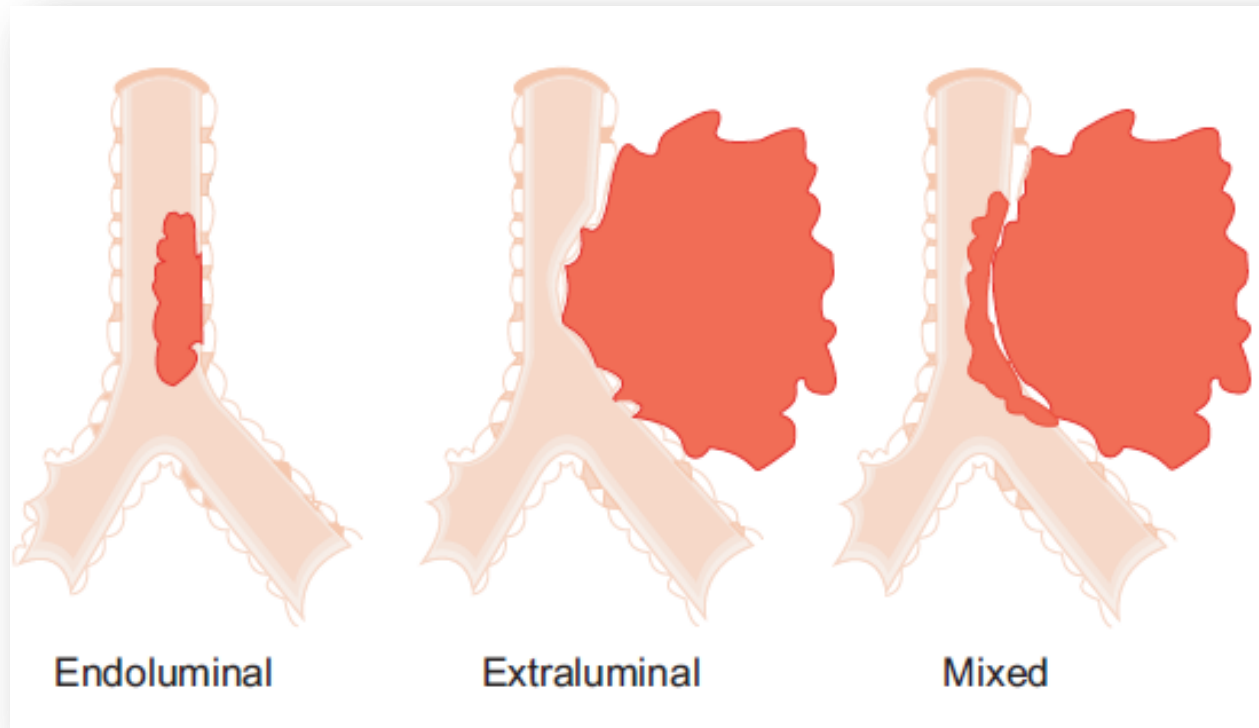
Central Airway Obstruction

Immediate Results after Nd:YAG Laser-Resection (Site/Number of Treatments/ Successful Disobliteration)



Endoscopic Treatment of Malignant Airway Obstructions in 2008 Patients
S. Cavaliere et al. Chest 1996; 110:1536-42

Malignant Airway Stenosis



Treatment Options in CAO

Immediate Effect

- **Mechanical Techniques**
 - Mechanical Debulking
 - „Coring out“
 - Cryorecanalisation
 - Stent
 - Microdebrider
- **Thermal Techniques**
 - Argonplasma-Coagulation
 - Laser
 - Electrocautery (Knife/Snare)

Delayed Effect

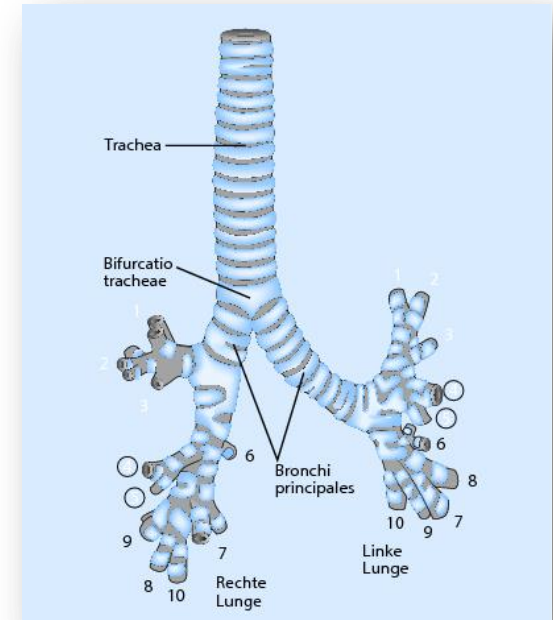
- Cryotherapy
- Brachytherapy
- Photodynamic Therapy

„Coring out“

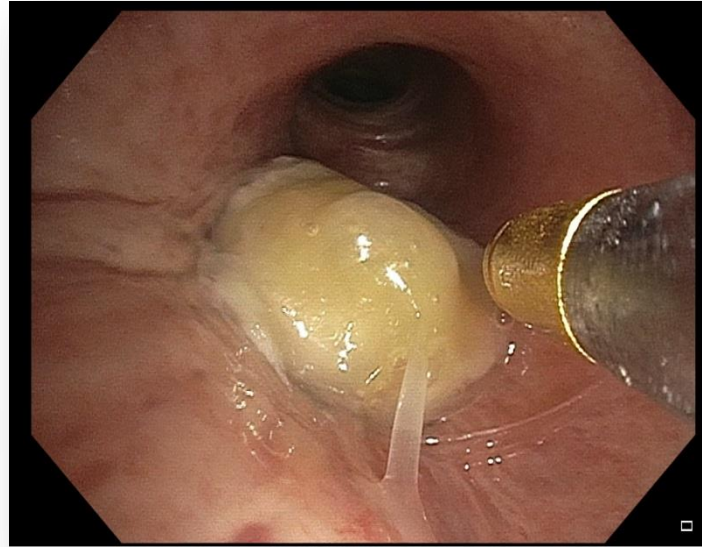


“Coring out”

- Rapid desobliteration
- Immediate symptom relief
- Only suitable for exophytic tumor growth
- Risk of bleeding
- Perforation

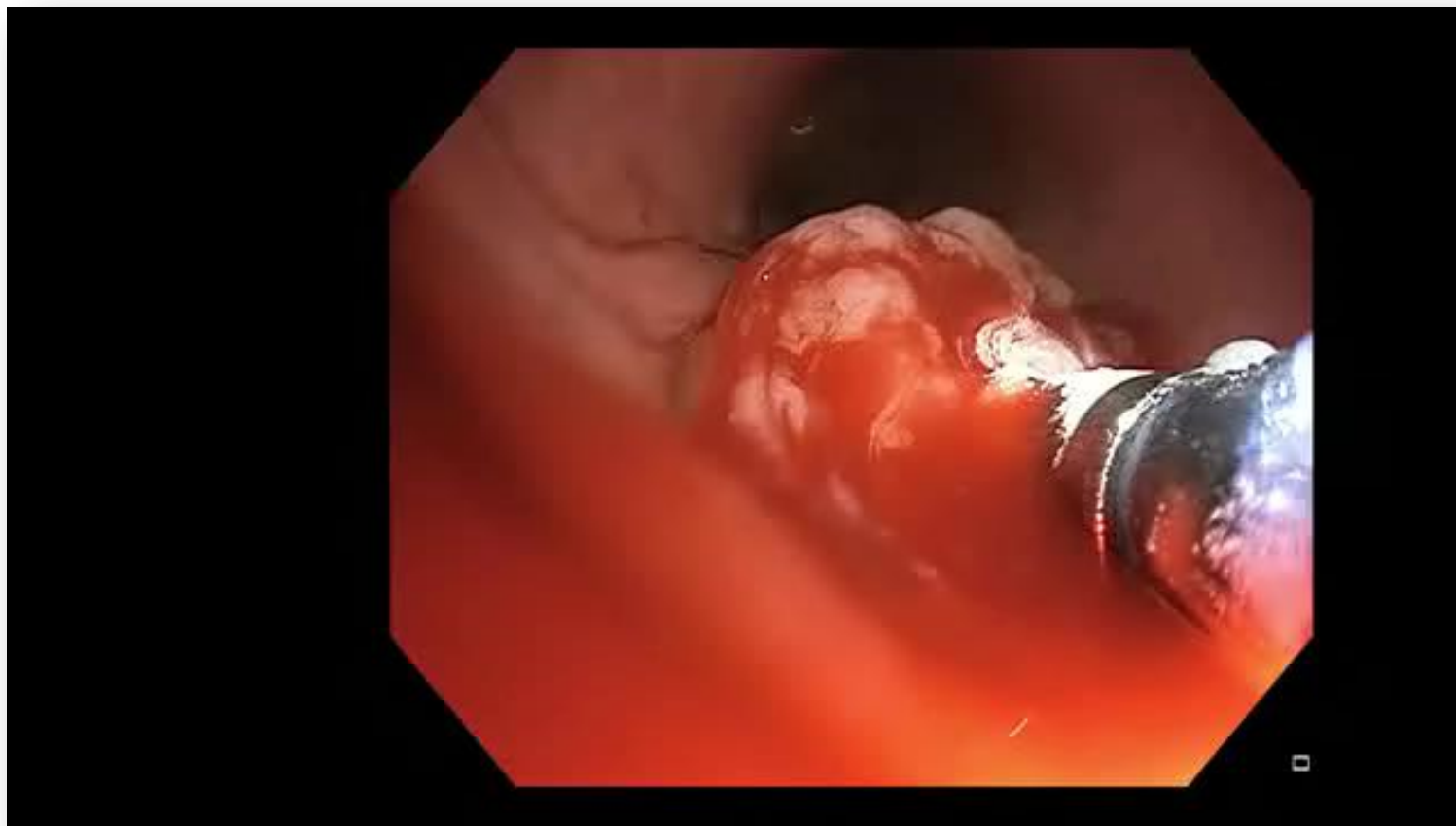


Cryotherapy/Cryorecanalisation



- Re-opening success rate of 91%
- Mild/moderate bleeding 12%
- Improvement of dyspnea, cough, lung function and QoL

Cryo-Recanalisation



What about Laser light?

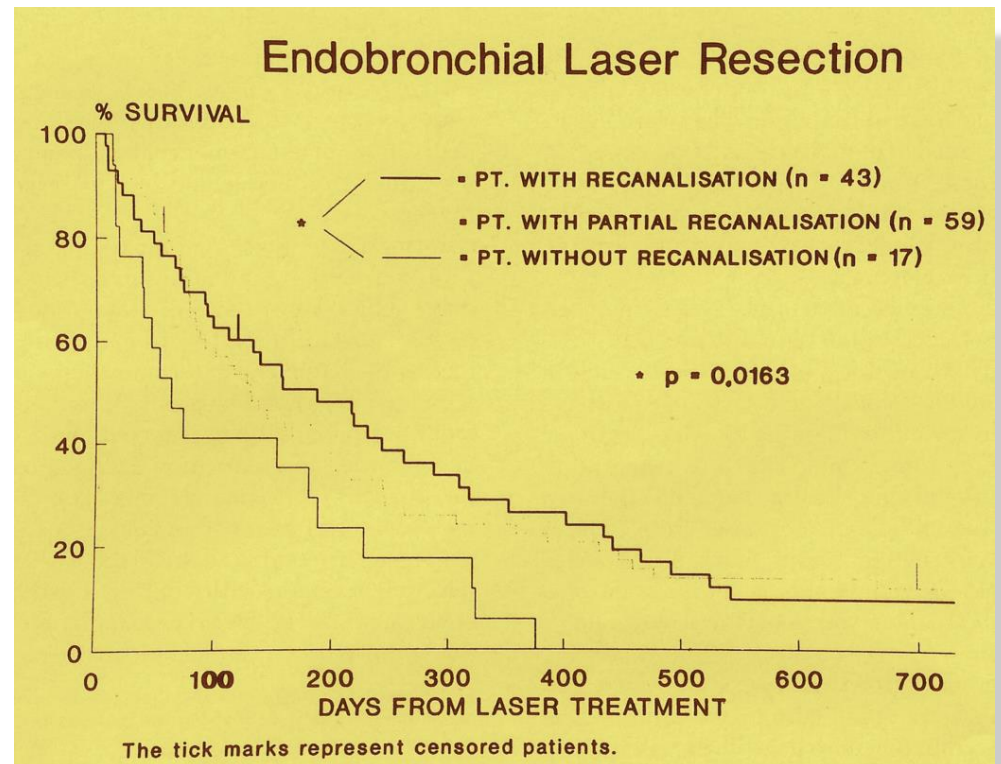


Macha et al, Chest 1994
Brutinel et al, Chest 1987
Cavliere et al, Chest 1996
Noppen et al, Ann Oncol 2002

Laser is cool!

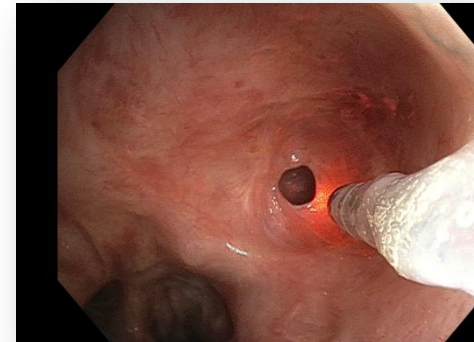
Endobronchial Laser Resection

- 75 Pat. with and 75 Pat. without laser resection
- matched pair analysis
- Successful laser resection improved OS by 4 month



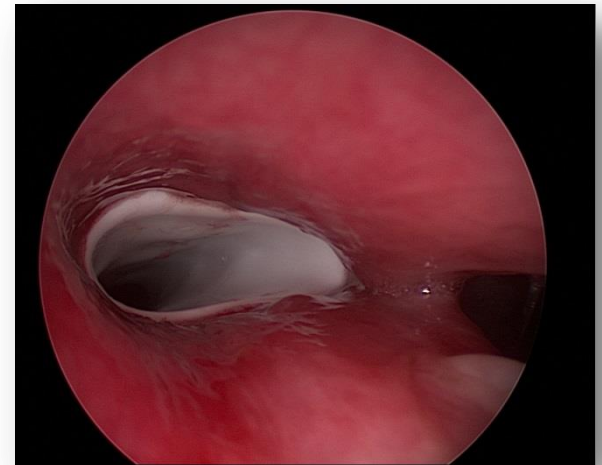
Endobronchial Laser Resection

- limited haemostatic properties
- financial resources
- legal requirements
- safety issues (wavelength-specific eyewear, etc)
- very precise instrument
- benign cicatricial stenosis
- diode laser > Nd-YAG-Laser



Stents

- 14 Pat. with CAO
 - 10 Tumor compression, 4 Post-therapeutic scar/malacia
 - 9 Trachea, 5 Main stem bronchus
- Silicone-Stents were placed in all patients
- Complications n=3
 - Granulation tissue, Tumor growth, Migration
- FEV1 improved from 1.27 to 1.72 l



Stents

- 60 Pat. with CAO
 - 50 Lung carcinoma, 3 Esophageal carcinoma, 7 metastases
 - 5 Trachea, 50 Main stem/Intermediate Br., 7 Lobar Br.
- Successful re-opening in all patients
- symptom relief in all patients
- Mean Survival 160 days
- Complications 23%:
 - Mucus plugging 8%
 - Granulation tissue 5%
 - Tumor ingrowth 5%
 - Stent migration 5%
- FEV1 improved from 1.45 to 1.78 l ($p = 0.003$)



Follow-Up Bronchoscopy after Intervention

- After Stent-Placement
 - High rate of complications
- Slow-growing lung cancer with CAO
 - Progress can be detected earlier
- Definite endoscopic treatment
- CAO after curative radiotherapy
 - Risk of cicatricial stenosis



Photodynamic Therapy



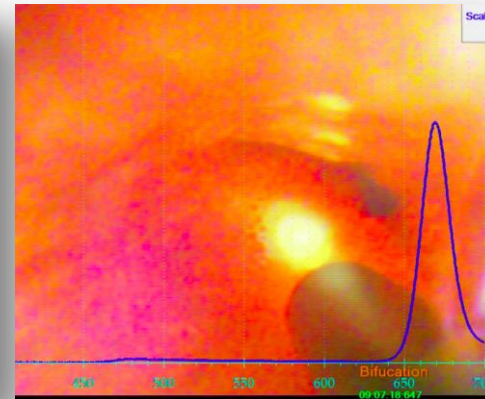
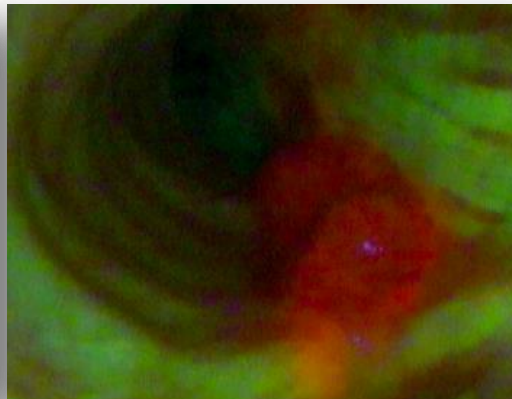
- Injektion of a sensitizer
- Activation with Laser
- Cytotoxic reaction
- Selective destruction of tumor cells

White light

AF

PDT

24h



PDT with Photofrin

Response Rates in Early Lung Cancer

110 patients, 123 lesions

| | |
|----------|---------|
| < 0,5 cm | CR 95 % |
| < 1 cm | CR 88 % |
| < 2 cm | CR 45 % |
| > 2 cm | CR 43 % |

≥1,5 cm + Brachytherapie CR 84%

Furuse K et al. J Clin Oncol 1993
Sutedja TG, J Bronchol 1994



An open-label phase IIb study to evaluate the safety, tolerability and efficacy of Fotolon® as a photosensitising agent for the local treatment of airway-obstructing non small cell lung cancer (NSCLC) with photodynamic therapy (PDT)

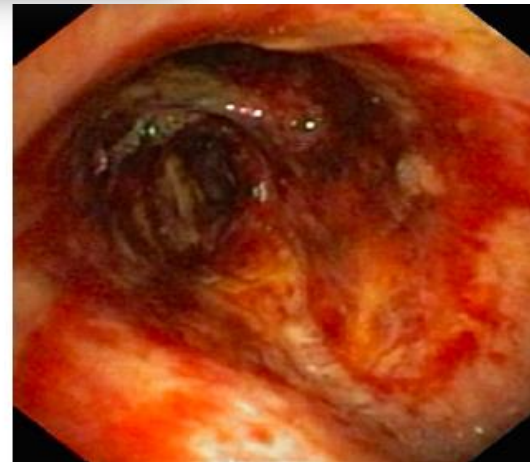
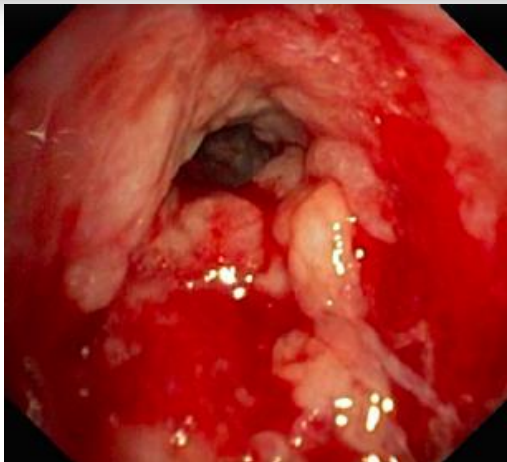
Study Code: AC_PDT_Lung_01

EudraCT number: 2013-001876-39

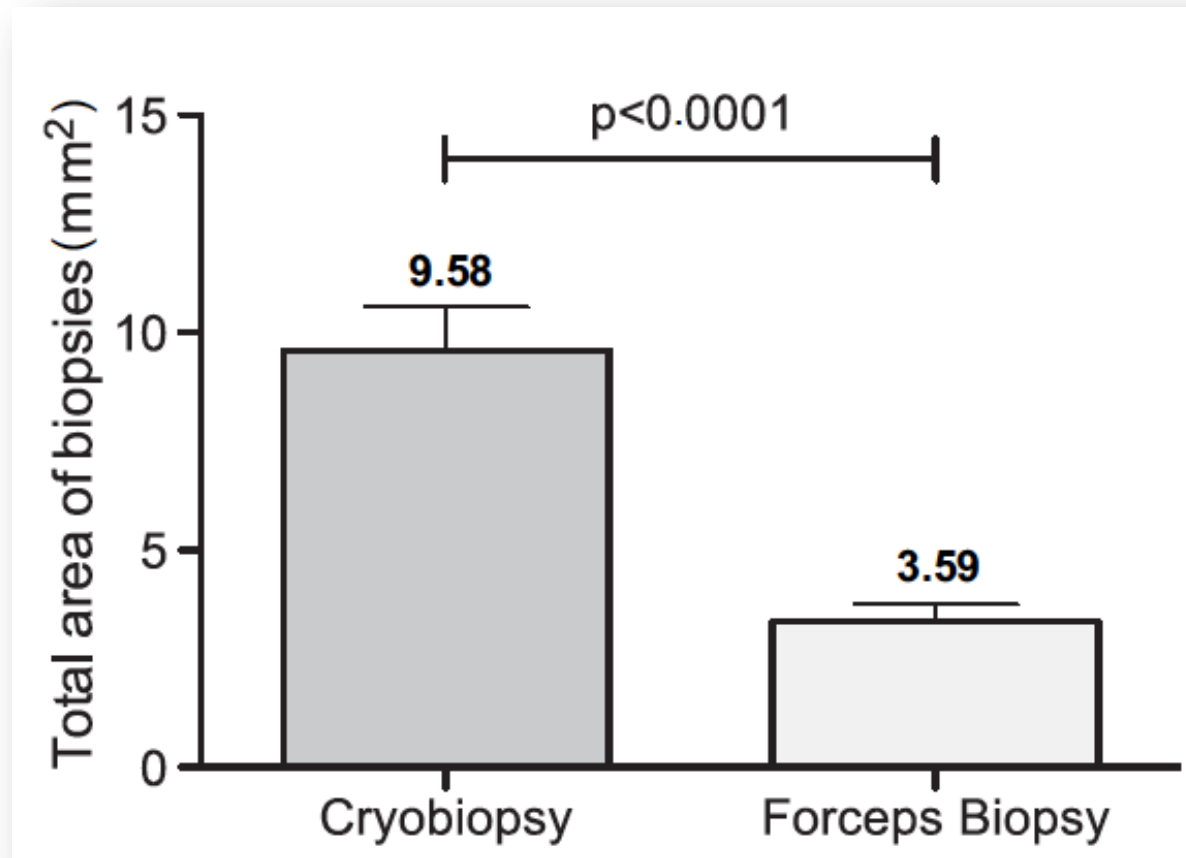
Previous version Number: Final V1.0

Final version date: 2014-03-17

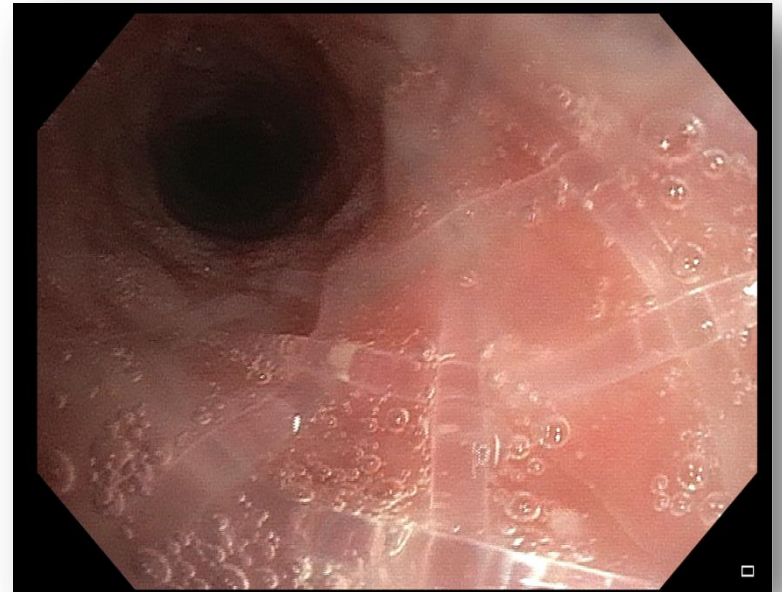
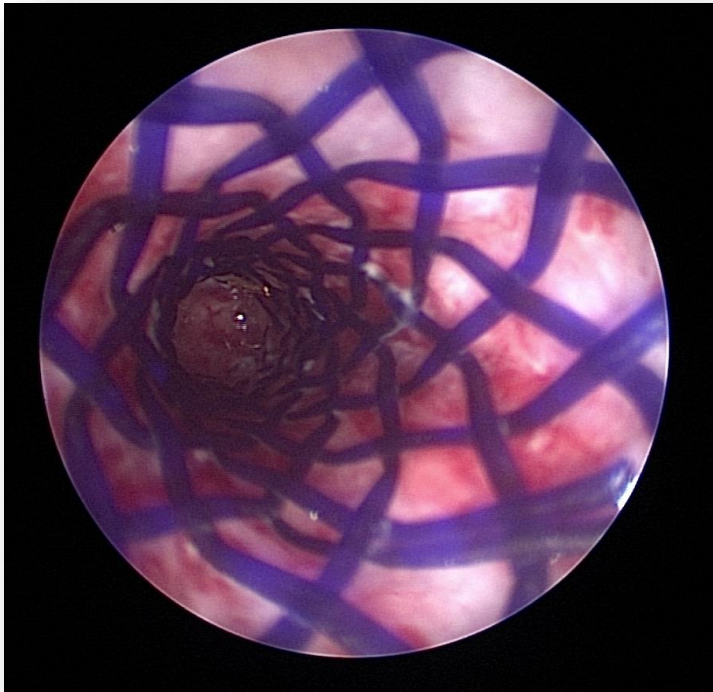
Last patient included
two weeks before



Cryobiopsy for genomic profiling



Biodegradable Stents



after 3 months

Conclusion

- Interventional Bronchoscopy improve lung function, dyspnea and Quality of Life in patients with malignant CAO
- This treatment should be part of standard palliative strategy for patients with CAO
- Follow-up bronchoscopy is recommended in patients after stent placement and if relaps/progress of CAO is probable

Thank you for your attention

