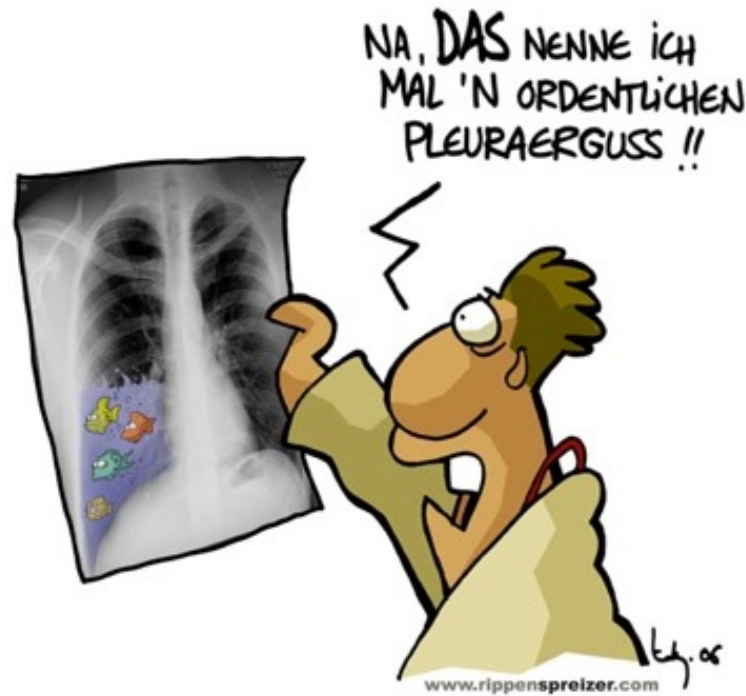
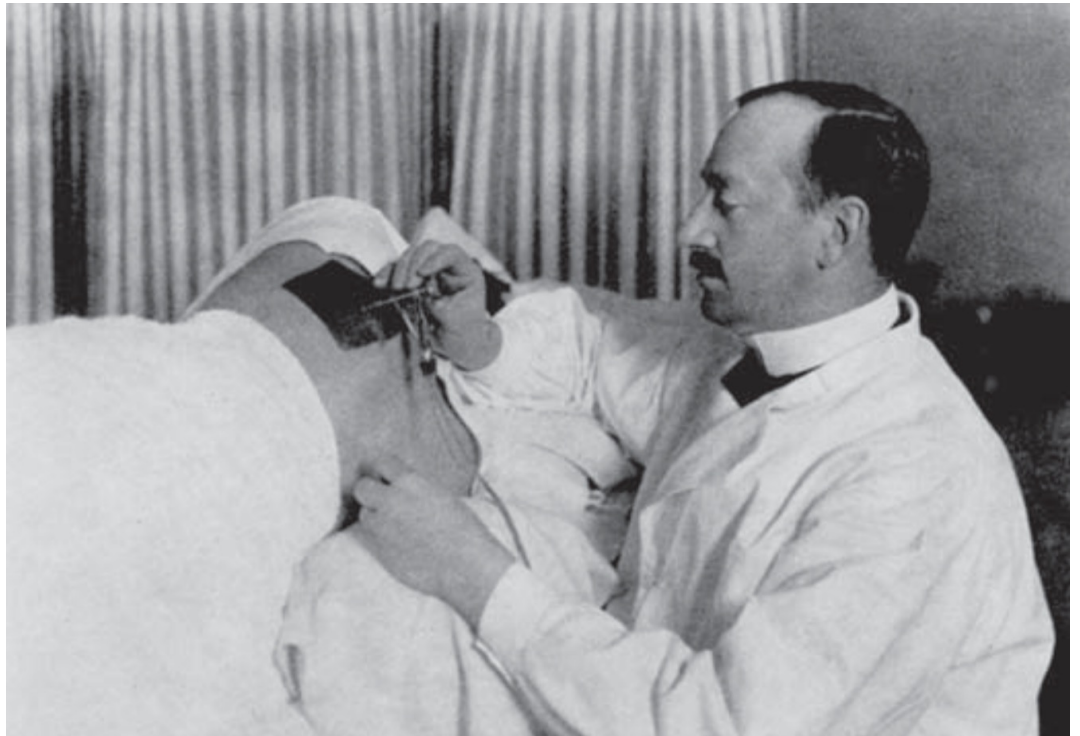


Mini-Thorakoskopie – warum nicht?

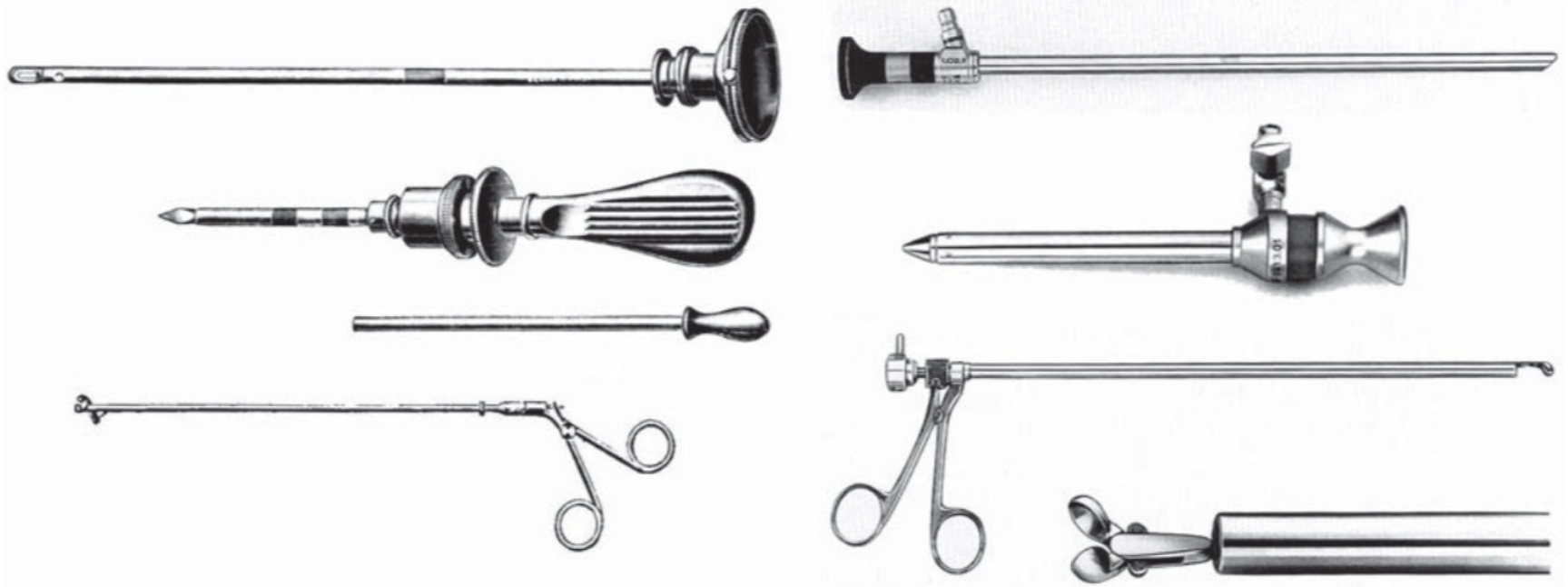
Tino Schneider

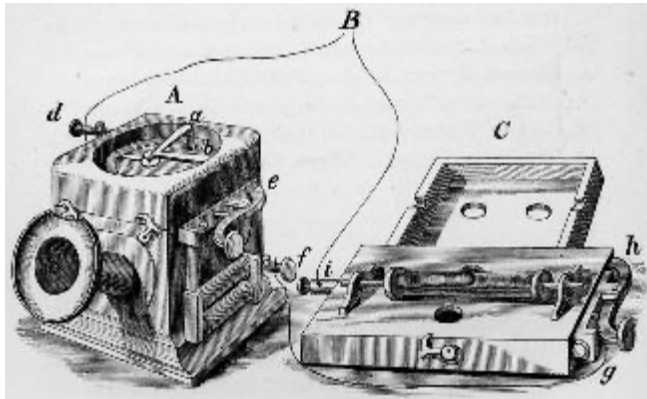


- ca.1910 Jacobeus

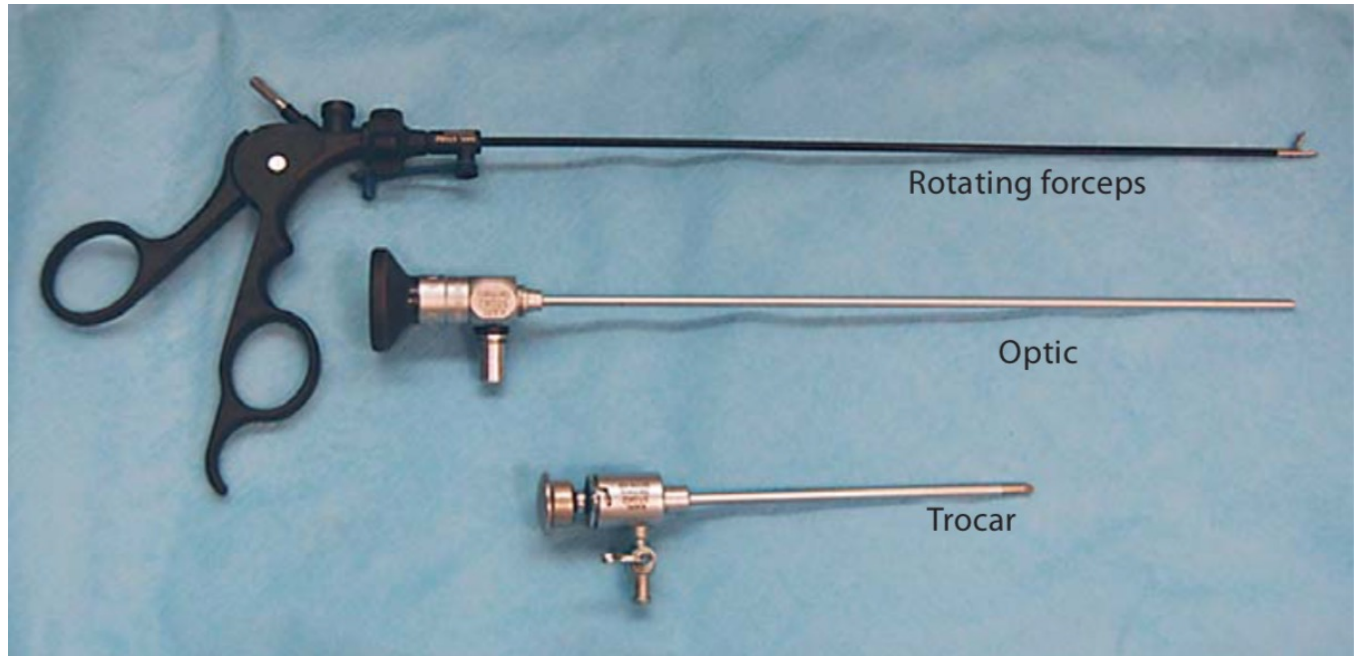


- ca. 1910 Jacobeus





- ca. 1998



- ca. 2000

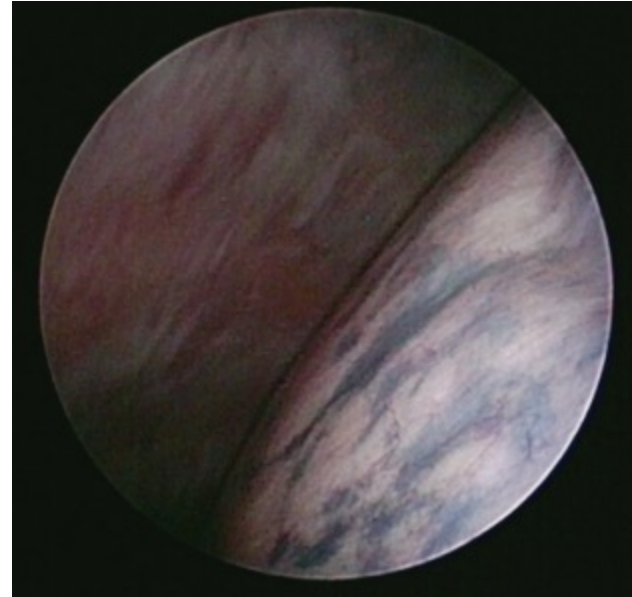


- Vorteile:
 - kleiner Erguss
 - schmaler Intercostalraum
 - Zugang bei multiplen Adhäsionen

- Vorteile:
 - kleiner Erguss
 - schmaler Intercostalraum
 - Zugang bei multiplen Adhäsionen



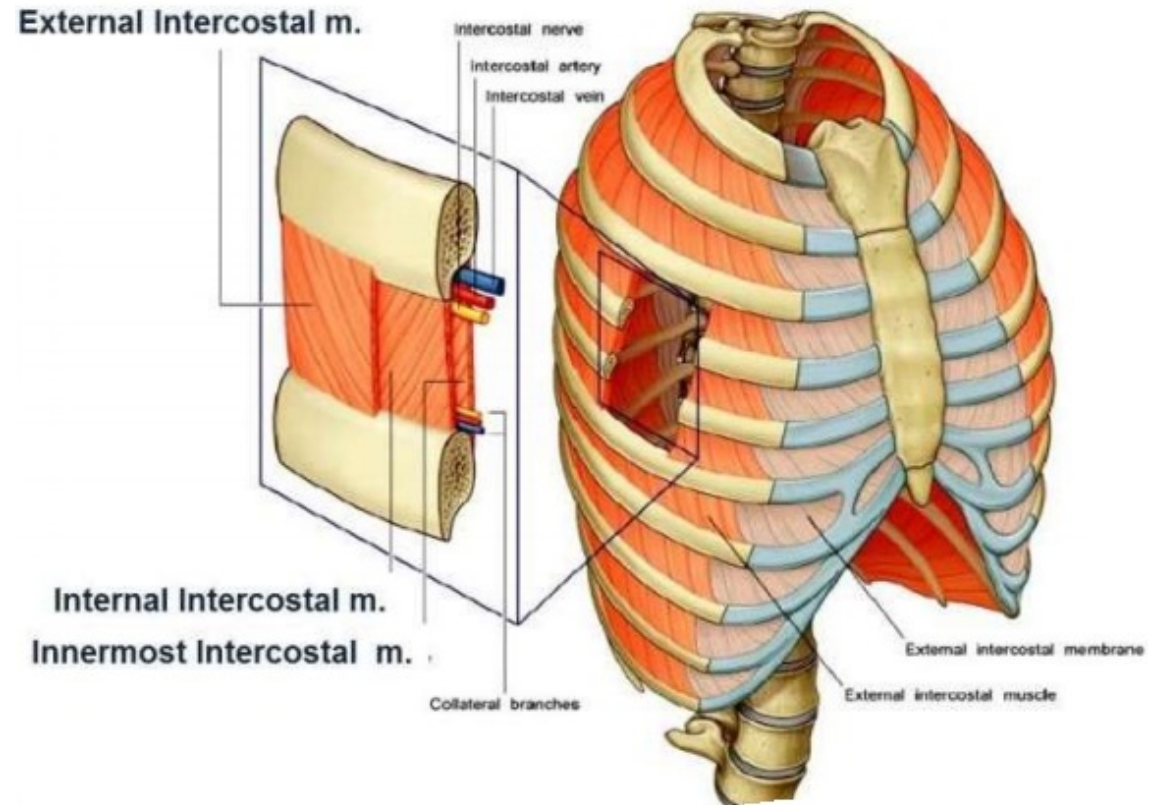
- Vorteile:
 - kleiner Erguss
 - schmaler Intercostalraum
 - Zugang bei multiplen Adhäsionen
 - erprobte Instrumente
 - leichte Handhabung
 - gute Sicht
 - weniger Lokalanästhesie
 - weniger Schmerzen
 - keine Hautnaht



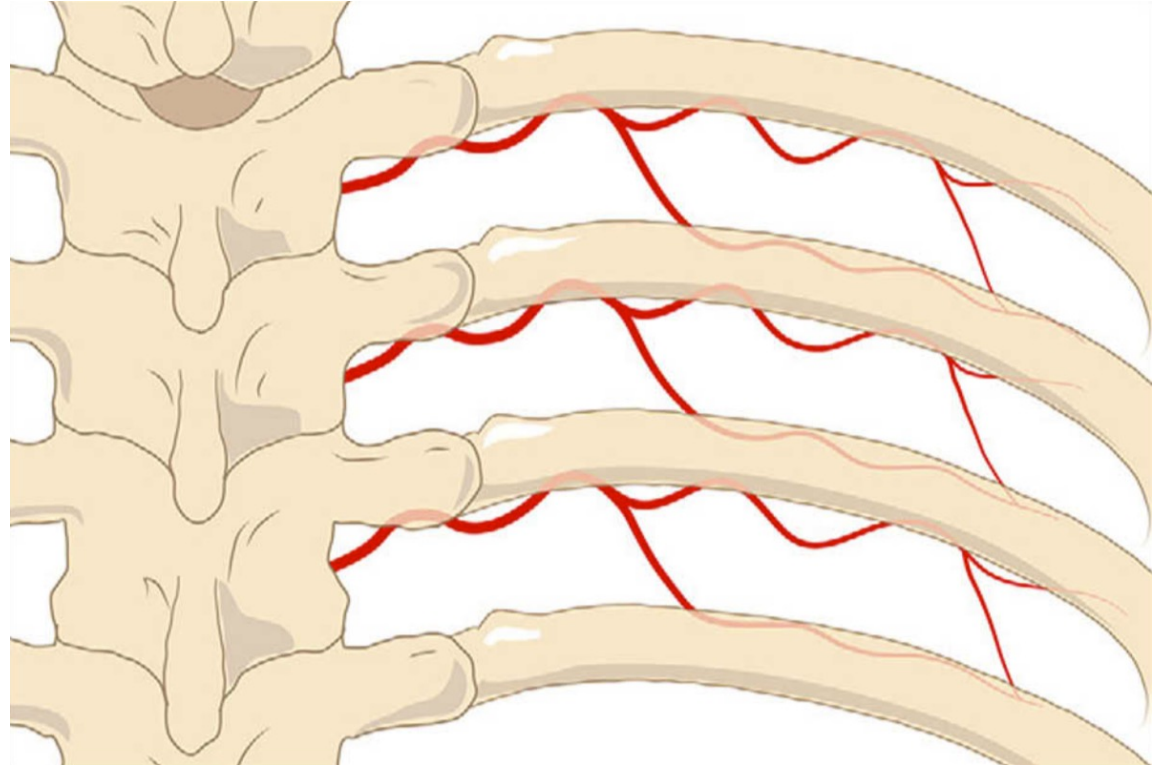
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- Technik

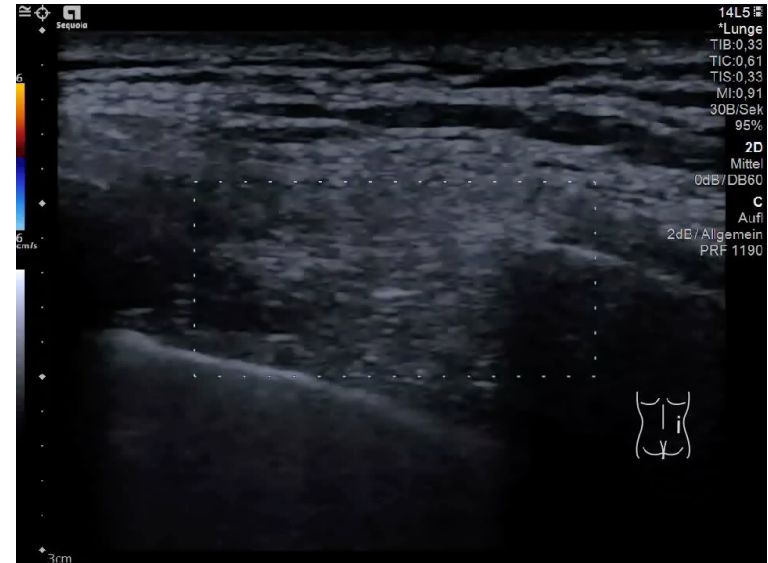


- Technik

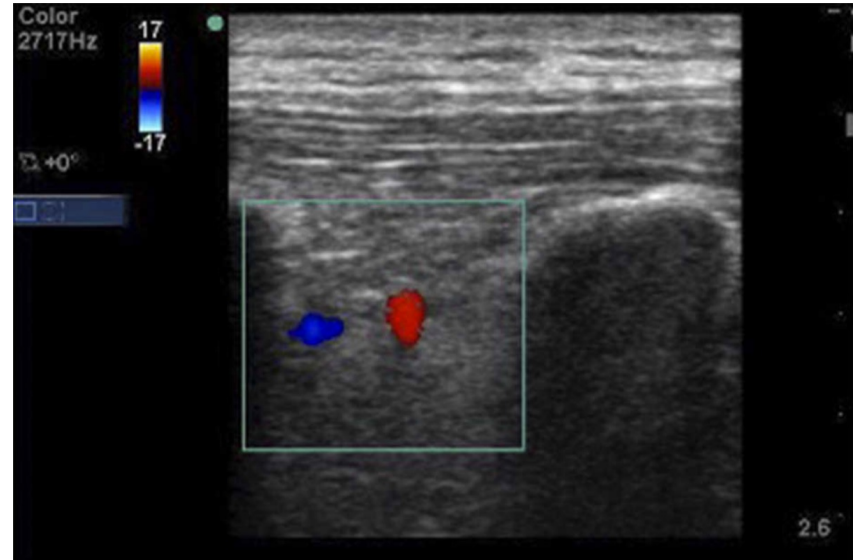


CHEST 2015; 147(1):e5-e7

- Technik
 - Thoraxultraschall
 - Zugang bei kleinem Erguss
 - atypisch verlaufende Intercostalarterie



- Technik
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 - atypisch verlaufende Intercostalarterie



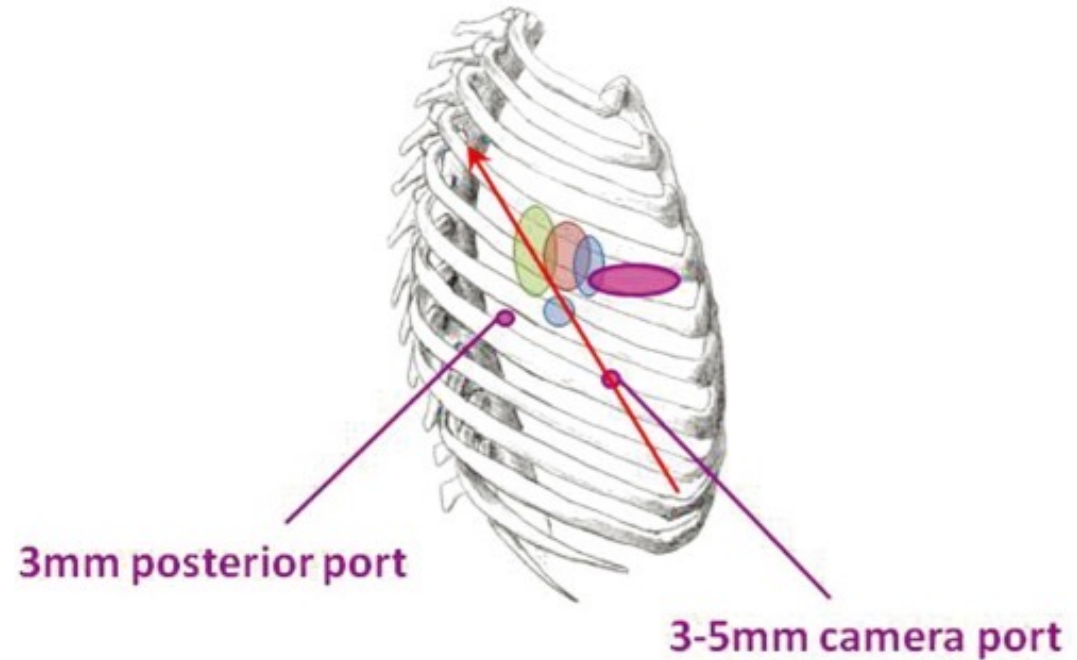
CHEST 2015; 147(1):e5-e7

- Technik



medizin.uni-halle.de

- Technik



- Technik
 - zwei Trokare
 - Sedation (Midazolam, Propofol)
 - Lokalanästhesie
 - erster Zugang
 - unter Sicht zweiter Zugang im benachbarten ICR
 - Inspektion/Biopsie/Pleurodese
 - Einlage Thoraxdrainage
 - SteriStrip™ für Wundverschluss



■ Vorteile:

- kleiner Erguss
- schmaler Intercostalraum
- Zugang bei multiplen Adhäsionen
- erprobte Instrumente
- leichte Handhabung
- gute Sicht
- weniger Lokalanästhesie
- weniger Schmerzen
- keine Hautnaht

■ Nachteile:

- fragile Instrumente
- Erfahrung mit Standardthorakoskopie
- Conversion manchmal notwendig
- kleinere Biopsate (konventionell vs. cryo)
- (etwas mehr Zeit)

- Vorteile:
 - **kleiner Erguss**
 - **schmaler Intercostalraum**
 - Zugang bei multiplen Adhäsionen
 - erprobte Instrumente
 - leichte Handhabung
 - gute Sicht
 - weniger Lokalanästhesie
 - **weniger Schmerzen**
 - **keine Hautnaht**
- Nachteile:
 - **fragile Instrumente**
 - Erfahrung mit Standardthorakoskopie
 - Conversion manchmal notwendig
 - kleinere Biopsate
 - (etwas mehr Zeit)

Rigid Mini-Thoracoscopy Versus Semirigid Thoracoscopy in Undiagnosed Exudative Pleural Effusion

The MINT Randomized Controlled Trial

Shweta Bansal, MD, DM, Saurabh Mittal, MD, DM,*
Pavan Tiwari, MD, DM,* Deepali Jain, MD,† Sudheer Arava, MD,†
Vijay Hadda, MD,* Anant Mohan, MD, PhD,* Prabhat Malik, MD, DM,‡
Ravindra Mohan Pandey, MD,§ Gopi C. Khilnani, MD,*
Randeep Guleria, MD, DM,* and Karan Madan, MD, DM**

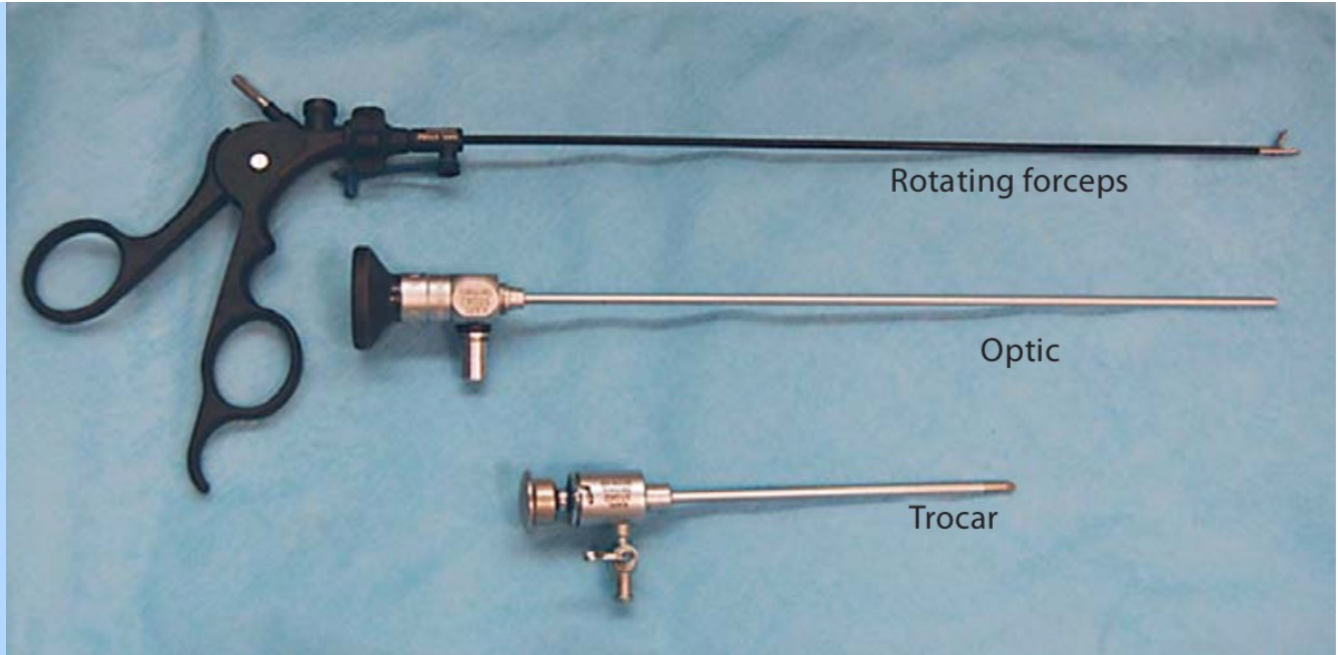
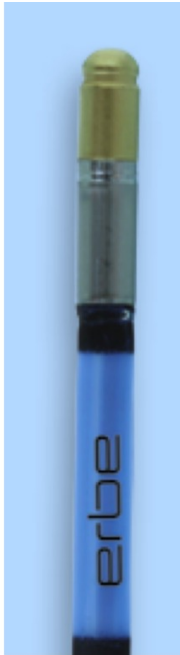
J Bronchol Intervent Pulmonol 2020;27:163–171

| | Mini-Thoracoscopy (N = 36) | Semirigid Thoracoscopy (N = 37) | Between Group Difference (95% CI) | P |
|---|-------------------------------|------------------------------------|--------------------------------------|---------------|
| Primary outcome | | | | |
| Diagnostic yield of pleural biopsy (intention-to-treat), n/N (%) | 25/36 (69.4) | 30/37 (81.1) | 11.4 (−9.9 to 30.5) | 0.25 |
| Key secondary outcomes | | | | |
| Diagnostic yield of pleural biopsy (as treated), n/N (%) | 25/33 (75.6) | 32/38 (84.2) | 8.4 (−11.9 to 29.0) | 0.30 |
| Diagnostic yield of pleural biopsy (crossovers excluded), n/N (%) | 25/34 (73.5) | 30/37 (81.1) | 7.5 (−13.6 to 28.5) | 0.46 |
| Dose of midazolam (mean ± SD) (mg) | 1.8 ± 0.8 | 1.8 ± 0.7 | — | 0.68 |
| Dose of fentanyl (mean ± SD) (µg) | 79.3 ± 25.4 | 73.1 ± 23.1 | — | 0.28 |
| Biopsy sample size (mean ± SD) (mm) | 16.1 ± 4.5 | 8.3 ± 2.9 | — | 0.0001 |
| Operator-rated overall procedure satisfaction, VAS (mean ± SD) (mm) | 84.5 ± 13.1 | 84.9 ± 7.4 | — | 0.87 |
| Operator-rated pain, VAS (mean ± SD) (mm) | 43.5 ± 16.7 | 31.7 ± 15.8 | — | 0.0001 |
| Patient-rated pain, VAS (mean ± SD) (mm) | 41.9 ± 17.3 | 32.1 ± 16.5 | — | 0.02 |
| Procedure-related complications, n (%) | 3 (9.1) | 6 (15.8) | — | 0.10 |
| Subcutaneous emphysema | 2 | 4 | — | |
| Fever | 1 | 1 | — | |
| Incision site infection | 0 | 1 | — | |
| Other outcomes | | | | |
| Adequacy of pleural biopsy, n (%) | 33/33 (100) | 38/38 (100) | — | |
| Quality of image, VAS (mean ± SD) (mm)* | 68.5 ± 20.1 | 71.5 ± 17.2 | — | 0.50 |
| Difficulty of scope maneuverability, VAS (mean ± SD) (mm)† | 54.2 ± 23.3 | 39 ± 21.9 | — | 0.003 |
| Operator-rated pain during scope manipulation, VAS (mean ± SD) (mm)‡ | 43.1 ± 19.6 | 33.3 ± 18.1 | — | 0.03 |
| Ease of taking biopsy, VAS (mean ± SD) (mm) | 44.6 ± 25.0 | 50.1 ± 22.5 | — | 0.33 |
| Expectation that biopsy will reveal histologic diagnosis, VAS (mean ± SD) (mm)§ | 83.9 ± 16.7 | 82.2 ± 14.9 | — | 0.64 |

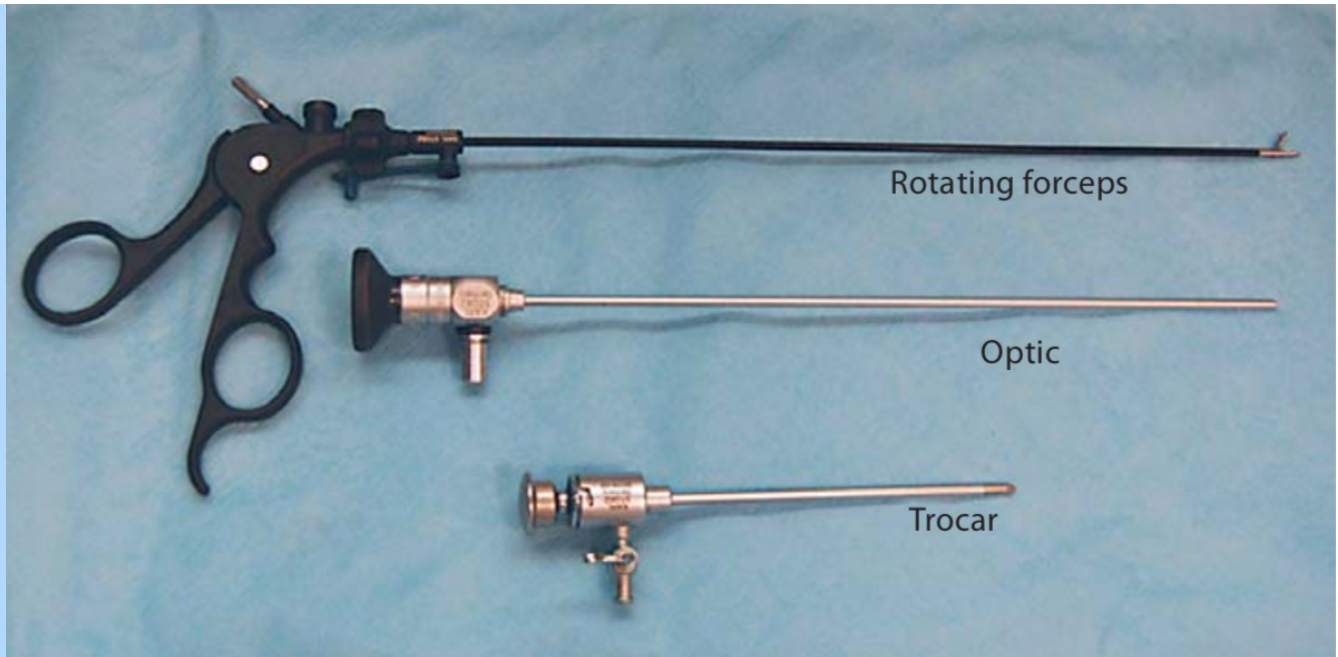
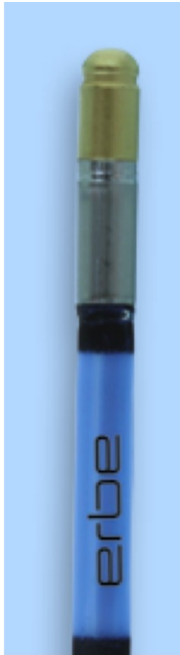
- ca. 1998



- ca. 2000

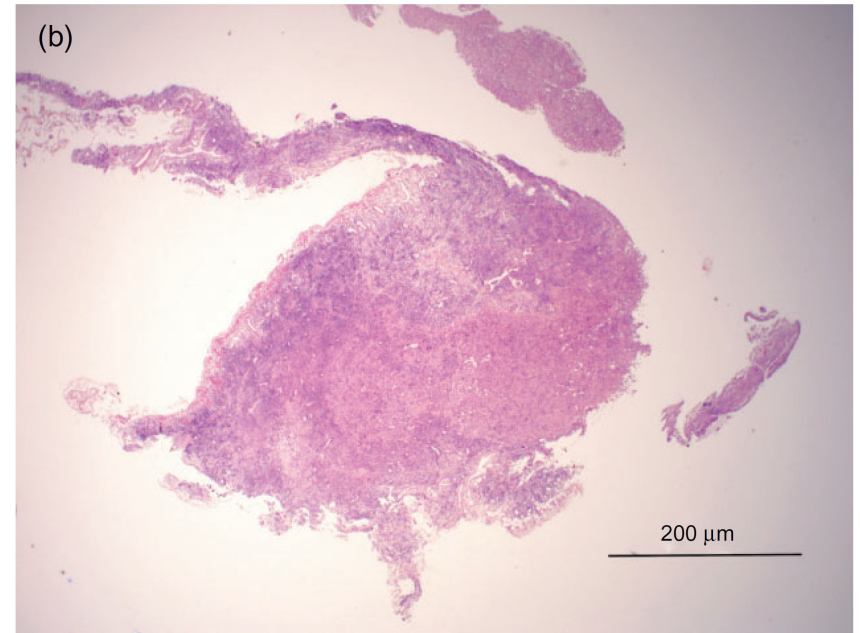
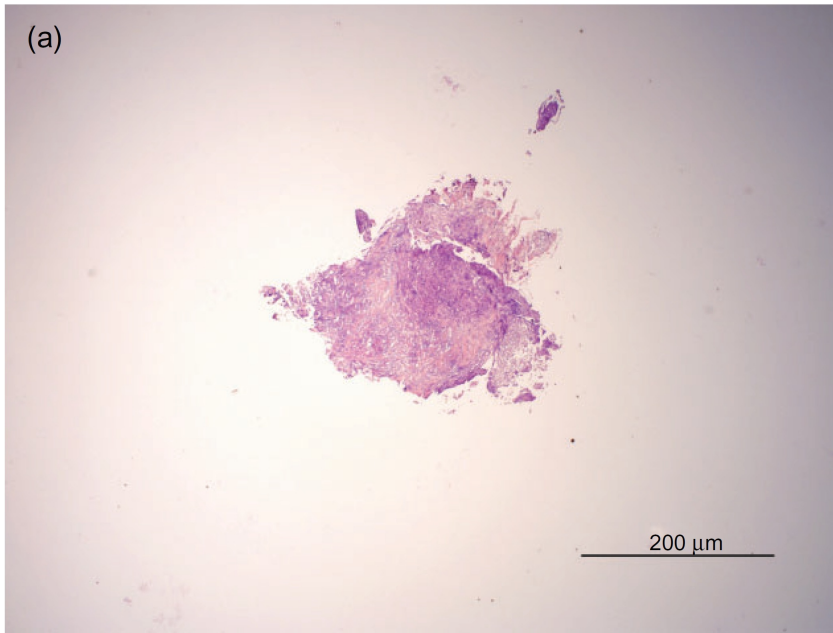


- ca. 2000



Rozman et al.: Clin Respir J 2016; 10: 574- 578

Thomas et al.: Respiriology (2015) 20, 327–332



Rozman et al.: Clin Respir J 2016; 10: 574- 578
Thomas et al.: Respiriology (2015) 20, 327–332

| | Flexible biopsy | Cryobiopsy |
|-------------------------------|--------------------|---------------|
| Histological details | <i>n</i> = 22 | <i>n</i> = 22 |
| Size (median, 25–75 IQR) (mm) | 4, 3–8 | 10, 7–15.8 |
| Crush artefacts | | |
| Nil | 1 | 20 |
| Mild | 19 | 1 |
| Moderate | 2 | 1 |
| Severe | 0 | 0 |
| Tissue present | | |
| Fibrotic pleura | 21 | 22 |
| Adipose tissue | 5 | 14 |
| Skeletal muscle | 2 | 10 |
| Lung [†] | 1 | 1 |
| Fragments | 1 | 0 |
| Definitive diagnosis | 20 | 20 |
| Bleeding | | |
| Nil | 18 | 17 |
| Mild | 4 | 5 |
| Moderate-severe | 0 | 0 |

Rozman et al.: Clin Respir J 2016; 10: 574- 578

Thomas et al.: Respirology (2015) 20, 327–332

Feasibility and Safety of Outpatient Medical Thoracoscopy at a Large Tertiary Medical Center

A Collaborative Medical-Surgical Initiative

*Zachary S. DePew, MD; Dennis Wigle, MD, PhD; John J. Mullon, MD, FCCP; Francis C. Nichols, MD, FCCP;
Claude Deschamps, MD; and Fabien Maldonado, MD, FCCP*

CHEST 2014; 146(2):398- 405

| Patient Characteristics | Value (N = 51) |
|-----------------------------|----------------|
| Age, y | 68.1 ± 12.3 |
| Sex | |
| Male | 38 (74.5) |
| Female | 13 (25.5) |
| ECOG performance status | |
| 0 | 27 (52.9) |
| 1 | 19 (37.3) |
| 2 | 5 (9.8) |
| Previous thoracenteses, No. | 1.9 ± 1.2 |
| Thoracentesis results | |
| Exudative lymphocytic | 44 (86.3) |
| Malignant cytology | 3 (5.9) |
| Suspicious cytology | 2 (3.9) |
| Exudative eosinophilic | 1 (2) |
| None | 1 (2) |

| Procedural Details | Value (N = 51) |
|--|----------------|
| Procedure time, min | 40.2 ± 12.4 |
| Procedurally related health-care visit time, min | 294 ± 73 |
| Sedation/analgesia | |
| Midazolam, mg | 4.1 ± 1.7 |
| Fentanyl, µg | 164 ± 87.5 |
| Pleural fluid removed, mL | 1216 ± 1007 |
| Parietal pleura biopsies, No. | 7.5 ± 2.6 |
| Lung re-expansion | |
| Concurrent TIPC insertion | 38 (74.5) |
| Small-bore pigtail thoracostomy tube | 12 (23.5) |
| TIPC already in place | 1 (2) |
| Endoscopic findings | |
| Parietal pleural inflammation | 26 (51) |
| Diffuse parietal pleural studding | 19 (37.3) |
| Normal | 3 (5.9) |
| Diffuse parietal pleural thickening | 2 (3.9) |
| Diaphragmatic defect | 1 (2) |

| Results | Value (N = 51) |
|-------------------------------|------------------|
| Malignant | 24 (47.1) |
| Mesothelioma | 14 (27.5) |
| Epithelioid | 8 |
| Sarcomatoid | 3 |
| Undifferentiated | 2 |
| Biphasic | 1 |
| Non-small cell lung cancer | 7 (13.7) |
| Adenocarcinoma | 6 |
| Squamous cell carcinoma | 1 |
| Diffuse large B-cell lymphoma | 1 (2) |
| Small cell lung cancer | 1 (2) |
| Renal cell carcinoma | 1 (2) |
| Nonspecific pleuritis | 23 (45.1) |
| Cellular atypia | 2 (3.9) |
| Sarcoidosis | 1 (2) |
| Empyema | 1 (2) |

| Procedure Detail | Pigtail Catheter (n = 12) | TIPC (n = 39) |
|--|---------------------------|---------------|
| Procedure time, min | 40.9 ± 10.5 | 39.9 ± 13.1 |
| Procedurally related health-care visit time, min | 329 ± 86 | 283 ± 69 |
| Reason for no TIPC | | NA |
| Minimal dyspnea | 3 (25) | |
| Dyspnea not improved by thoracentesis | 3 (25) | |
| Patient preference | 3 (25) | |
| Minimal effusion | 2 (16.7) | |
| Trapped lung | 1 (8.3) | |
| Subsequent procedures | 6 (50) | 8 (20.5) |
| Thoracentesis ^a | 2 (16.7) | 2 (5.1) |
| Pleurectomy/decortication ^b | 2 (16.7) | 1 (2.6) |
| Surgical pleural biopsy ^b | ... | 2 (5.1) |
| Extrapleural pneumonectomy ^b | ... | 2 (5.1) |
| Talc pleurodesis ^b | ... | 1 (2.6) |
| TIPC insertion ^a | 1 (8.3) | ... |
| Thoracentesis ^c | 1 (8.3) | ... |

CHEST 2014; 146(2):398- 405



