

Quality of Life and Functional Recovery After Complicated Pleural Infections Treated with Intrapleural Fibrinolytic Therapy (IPFT) vs. Surgery – Is One Clearly Better?

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The clinical question

How do quality of life and functional ability compare after complicated pleural infections (CPI) treated with intrapleural fibrinolytic therapy (IPFT) versus surgical interventions?

Take Home Message

- Patients with complicated pleural infections (CPIs) have a lower quality of life (QOL) compared to the general U.S. population, regardless of the treatment received.
- On average, patients returned to work within four weeks after CPI treatment.
- Nearly half of the patients experienced a negative impact on their work during recovery, and 10% reported a need to change occupation.
- Patients who underwent surgical management had better post-recovery functional ability.
- Patients treated with intrapleural fibrinolytic therapy (IPFT) reported less pain during treatment.

Background

The standard of care for complicated pleural effusions includes antibiotics and chest tube drainage. More aggressive measures are often needed when initial management fails. There is ongoing debate regarding the efficacy of surgical versus medical management in patients who fail initial treatment. Medical management with intrapleural fibrinolytic therapy is becoming increasingly popular, as surgery, historically the standard, is associated with longer hospital stays and higher costs.

While most available data focus on the clinical outcomes of different management strategies, limited research exists on patient-reported quality of life and functional ability, particularly when comparing surgical versus medical management. This study aims to assess the quality of life and functional ability of patients after intrapleural fibrinolytic therapy versus surgical management in a multistate, community-based hospital setting.

Study Design

Type of study:

Multi-center questionnaire-based study

Outcomes:

Quality of life and, and employment and functional ability outcomes following CPI

Data collection:

Patients who met the inclusion criteria were contacted telephonically or via mail to complete the questionnaires.

- Questionnaire for QOL: RAND* Patients completed a 36-Item Short Form (SF-36) Survey Instrument that measured scaled scores for physical functioning, physical role limitations, emotional role limitations, energy/fatigue, emotional wellbeing, social functioning, pain, and general health within the 30 days before completing the survey. Responses were therefore related to the time around the questionnaire's completion.
 - Widely validated research tool.
- Questionnaire for employment and functional ability: The assessed parameters included employment status, hours worked, time to return to work, and change in occupation or work effectiveness due to CPI. Assessment time points were before infection, following discharge, and while responding to the questionnaire.
 - Novel, unvalidated research tool designed by the authors.

Intervention(s):

Medical (intrapleural fibrinolytic therapy) versus surgical (video-assisted thoracoscopic or thoracotomy decortication) management of CPI

Statistical analysis:

Chi squared, Wilcoxon tests, and generalized linear mixed modeling.

Population

Inclusion criteria:

Patients with CPI (n=565) who underwent IPFT and/or surgical CPI management between 1/1/2013 -3/3/2018 at Swedish Medical Center and Providence Health and Services which spans 5 states including Alaska, California, Montana, Oregon and Washington.



Exclusion criteria:

Exclusion at baseline:

- Since IPFT cohort was created using a pharmacy billing database for inpatient dornase administration, patients with cystic fibrosis (who frequently receive DNase alfa for treatment) were not included in the initial cohort of 565 patients.

Exclusion before interview:

- Deceased (n=82)
- Bilateral effusions (n=23)
- Of the 565 patients included in the initial cohort, 82+23=105 were thus excluded, and 460 qualified for the interviews

Exclusion following interview:

- Non-responders (n=301)
- Responded but declined participation (n=61)
- Failed to answer >50% of questionnaire (n=5)
- Non-English speakers (n=3)
- Of the 460 patients included for interviews, (301+61+5+3=370) were thus excluded. Only 90 (20%) patients qualified for the final analysis, 45 each in the medical and surgical management arms.

Baseline characteristics:

Median age: 61 (50-66)

Sex: 63% male (n=57)

Race: 89% White (n=80), 3% Asian (n=3), American Indian /Alaska Native 1%(n=1)

Employment information: 63% were employed before CPI with median 40 hours per week (IQR:30-40).

Median body mass index: 27 kg/m² (IQR:24-31)

Median RAPID score: 3 (IQR:2-4)

Phase of infection: 58% Complicated parapneumonic effusion (n=52) Vs 42% Empyema (n=38)

Source of infection: 92% Community (n=83) Vs 8% Hospital (n=7)

Time to follow up from hospital: 43 months (IQR: 31-55)

Location: 61% in Washington State (n=55), 23% in Oregon (n=21), 7% in Montana (n=6), 6% in Alaska (n=5) and 3% in California (n=3)

Outcomes



Quality of Life:

- Patients managed with surgery had higher median physical functioning scores than IPFT patients (Surgery: 80, IPFT: 70, $P=0.040$)
- Patients managed with IPFT reported less pain than those managed surgically (Surgery: 58, IPFT: 68, $P=0.045$)
- Physical limitations, energy/fatigue, emotional well-being, social functioning and general health in total patient cohort were not different in IPFT vs Surgery group and were lower than US normal scores with the exception of emotional limitation, which was equivalent.

Work and functional ability:

- Following discharge, 93% of patients returned to work/regular activities within 4 weeks (IQR: 2-8).
- At the time of questionnaire completion, 81% of patients who had returned to work were still working.
- Among those who returned to work, 48% reported decreased work effectiveness and 10% reported a need to change careers after CPI.
- Return to work and functional ability were similar between IPFT and Surgery groups.
- Median work hour before and after CPI was 40 hours per week (IQR 30-50).

Commentary

Study Strengths:

The focus on QOL and functional ability of patients following CPI treatment, which was not studied before.

Providing a comparison between medical and surgical management.

Reporting time to return to work and the impact on employment.

Multi-state setting, covering a large demography that strengthens the generalizability of the study findings.

Study Limitations:

- Participation bias (participation rate only 20%)
- Concerns for selection bias (patients with poor outcomes might be more motivated to share their negative experiences).
- Recall bias (due to a long follow-up period and patient's clinical status during hospitalization)

Study Limitations continued...

- Limited objective baseline health assessment, hence patients may have overestimated their pre-hospitalization QOL
- Lack of racial diversity (89% white patients)
- Overlap with the COVID-19 pandemic, which could have influenced the patient's QOL independently
- The reference US population data used was published in 1993, 30 years ago, and may have substantially changed now

Additional comments:

- Differences in the schedule/frequency of tPA/Dornase instillation were not mentioned in the IPFT group, so the variability thereof cannot be assessed.
- Potential referral bias in sending fitter patients to surgery and protocolized physical therapy after surgery could have benefited the surgical cohort in regaining functional abilities.



Funding and Institutional Review

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Suggested reading

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