

Outcomes of Therapeutic Bronchoscopy in Malignant Airway Obstruction Causing Acute Respiratory Failure

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The clinical question

How does therapeutic bronchoscopy for malignant central airway obstruction with respiratory failure affect outcomes in the modern era of treatment?

Take Home Message

Critically ill patients due to respiratory failure secondary to malignant central airway obstruction (MCAO) have potential for reversibility and should be assessed for consideration of therapeutic bronchoscopy. Cases should be evaluated by a multidisciplinary panel including an interventional pulmonologist before withholding or interrupting life supporting measures.

Background

Cancer treatment and therapies offered to patients is often based on function status and WHO performance scores. Mechanical ventilation needs among patients with cancer is a known poor prognostic factor. However mechanical ventilation secondary to malignant central airway obstruction is a potentially reversible condition. Therapeutic bronchoscopy has shown success in clinical outcomes and sufficient safety in malignant central airway obstruction. However, due to the heterogeneity of this patient population and advances in oncological treatment, it is challenging to draw conclusions from prior smaller studies on this topic. This study's aim was to collect data over a longer period from multiple centers to assess outcomes in this variable population in the current era. The goal of this paper was to help clinicians make appropriate decisions and provide the patient and families realistic outcomes.

Study Design

Study Design

- Prospective, Multicenter Study

Primary outcome

- Survival
- Weaning of oxygen requirements
- Eventual oncologic treatment

Secondary Outcome(s)

- Analyze factors affecting outcomes including performance status, previous oncologic treatment, level of obstruction and tumor histology.

Intervention(s)

- Therapeutic Bronchoscopy for management of malignant obstruction (mechanical debulking/dilation with or without stent insertion)

Population

Inclusion criteria

- Patients undergoing rigid therapeutic bronchoscopy for MCAO were enrolled into the EpiGETIF registry from January 2019 to November 2022
- Acute respiratory failure requiring mechanical ventilation (invasive or noninvasive) or high-flow nasal cannula (HFNC)
- MCAO defined as occlusion of 50% or more of the lumen of any central airway.

Exclusion criteria

- NA

Baseline characteristics

Patients: n (% or mean \pm SD)

- Total subjects: 177
- Study Duration: 47 months
- Age: (y) 63.5 \pm 9.7
- Females: 58 (32.8)
- BMI: 22.8 (\pm 4.8)
- Tobacco Exposure: 29.1 (\pm 24.8)
- Pre-procedure WHO score
 - 0 – 3 (1.7)
 - 1 – 40 (22.6)
 - 2 – 47 (26.6)
 - 3 – 61 (34.5)
 - 4 – 19 (10.7)

Histology

- Any bronchogenic – 115 (65)
 - Lung adenocarcinoma – 29 (16.4)
 - SCC – 56 (31.6)
 - SCLC – 11 (6.2)
 - Other – 19 (10.7)
- Non-bronchogenic – 43 (24.3)
 - Lymphoma – 4 (2.3)
 - Esophagus – 22 (12.4)
 - Sarcoma – 4 (2.3)
 - Melanoma – 1 (0.6)
 - ENT – 5 (2.8)
 - Urothelial – 1 (0.6)
 - Other GI – 2 (1.1)
 - Breast – 1 (0.6)
 - Prostate – 1 (0.6)
 - Endometrium – 1 (0.6)
 - Thyroid – 1 (0.6)

Lung Cancer Stage

- 2 – 1 (0.8)
- 3 – 49 (42.6)
- 4 – 54 (47.0)

New Diagnosis/Treatment-naive – 112 (63.3)

Outcomes

Primary outcome

- The median survival was 63 days in the whole cohort, but it was 216 days among patients who were able to receive further oncologic treatments.
- 79.7% of patients were weaned after a median of 1 day. Median hospital stay was 3 days post procedure.
- Oncologic treatments occurred in 48.6% of cases.

Secondary outcomes

- Preoperative factor associated consistently with favorable outcomes was a lower pre-procedure WHO score

Adverse events

- NA



Commentary

Respiratory failure due to malignant airway obstruction is a generally safe and potentially reversible condition and can qualify a patient for oncologic treatment. This prospective multicenter study complied a heterogenous group of patients with respiratory failure from critical malignant central airway obstruction who underwent therapeutic bronchoscopy. After the intervention roughly eighty percent were able to be weaned from invasive or noninvasive modalities of oxygen support after a median of one day. In that group, roughly fifty percent of patients underwent further oncologic treatment. Of the 177 patients included in this group a median survival of 63 days was noted, longer if able to receive further oncological treatments, 216 days. This study concludes that therapeutic bronchoscopy should be offered and discussed prior to withholding or withdrawing care in this patient population.

A limitation of this study is the heterogeneous nature of the population included, allcomers with MCAO and respiratory failure and the lack of a control group (those who elected not to proceed with treatment). It would be unethical to randomize this population. The study draws comparisons to the expected patient survival of mechanically vented patients with cancer noted to be roughly 70%. A challenging comparison as respiratory failure due to malignancy can be multifactorial. Further this paper does not comment on patients who may have fallen into this subset, but family/patient elected not to undergo therapeutic bronchoscopy. Finally, the decision on interventions planned, oncologic treatments offered where not standardized and based on the clinicians and family discussion.

Funding

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Suggested reading

(References in Vancouver style)

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Article citation

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