

# Use of Cryotherapy to Treat Obstructing Papilloma of an Accessory Tracheal Bronchus - Case Report

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## Research Article

**Keywords:** Bronchoscopy/Bronchus, Cryotherapy, Tracheal Tumor, Case Report

**Posted Date:** June 14th, 2022

**DOI:** <https://doi.org/10.21203/rs.3.rs-1332885/v1>

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# Abstract

## Background:

Tracheal papillomatosis is a relatively rare condition with limited data on successful treatment modalities. To our knowledge, this is the first report to describe a papilloma arising from an accessory bronchus. Furthermore, this case report demonstrates successful treatment with clinical and patient-centered improvements after use of Spray Cryotherapy

## Case Presentation:

A 71-year-old woman presented with one year history of recurrent fevers and intermittent hemoptysis. Imaging and video bronchoscopy revealed an obstructing papilloma of an accessory tracheal bronchus to the right upper lobe. She was treated with debridement followed by multiple cryotherapy treatments resulting in resolution of her symptoms and post-obstructive pneumonia on imaging.

## Conclusions:

This case report not only supports existing literature on the use of cryotherapy for airway diseases but also presents a unique form of obstructing papilloma confined to an accessory bronchus.

## Introduction:

Tracheal papillomatosis is characterized by papillomatous growth of the bronchial epithelium associated with Human Papilloma Virus (HPV). Occurring in either the larynx or trachea, this is a relatively rare condition with bimodal expression in children and adults in their 5th -6th decade<sup>1</sup>. In the adult population, incidence is estimated at about 18 in 1 million and are at risk for transformation to squamous cell carcinoma (2%)<sup>1</sup>. Symptoms of tracheal papillomatosis are largely non-specific, ranging from dyspnea to hemoptysis. Several treatment modalities have been suggested in the literature including probe-directed cryotherapy, CO2 laser ablation, interferon- $\alpha$  injection, and surgical excision<sup>1-4</sup>. In this particular case, cryotherapy was elected as the preferred treatment modality using a novel approach of trufreeze® Spray Cryotherapy ablation technology (Steris, Mentor, OH, US). This method of cryotherapy differs from traditional probe application, where direct contact with the probe is required and tissue removal is often the end result. Spray cryotherapy allows for even application of cryogen without requiring direct contact with the probe, resulting in evenly distributed tissue damage and cell death. The resulting even distribution of treatment is desirable in dysplastic tissue. Furthermore, this patient's anatomy was of particular interest, as she had an accessory tracheal bronchus, a congenital tracheobronchial anomaly and variant of *bronchus suis*, which is defined by a bronchus that arises superior to the carina, and has a reported incidence of 0.2%<sup>6</sup>. To our knowledge, this is the first report to describe a papilloma arising from an accessory bronchus.

## Case Report:

71-year-old lifelong nonsmoker with history of asthma and rheumatoid arthritis who presented to her pulmonologist with a complaint of one year of cough, fevers, night sweats, and intermittent hemoptysis. She underwent CT scan of the chest which demonstrated a multiloculated density in the RUL (Figure 1a) with an obstructing mass extending into the tracheal lumen and involving an accessory bronchus to the RUL with no other airways involved (Figure 2a). Extirpation of the mass was performed with biopsy forceps which resulted in drainage of purulent material and subsequent visualization and patency of the accessory bronchus to the RUL. She completed a full course of oral antibiotics and one month later, she presented for scheduled bronchoscopy and cryotherapy. Residual papilloma within accessory bronchus was noted and treated with cryotherapy using three five second treatments of liquid nitrogen (Figure 3b). The patient had two subsequent treatments over the time span of 9 months, roughly three months between each treatment cycle. As of her most recent follow up, the airway has maintained full patency with improvement of symptoms as well as obstructive pneumonia on imaging.

## Discussion:

There have been several case reports describing success of various methods to treat recurrent respiratory papilloma as well as some retrospective studies. However, given the rarity of this condition, there have been no randomized control trials comparing efficacy of different treatment modalities. In our case, the degree of obstruction necessitated endoscopic excision followed by treating remaining tissue with cryotherapy to maintain patency of the airway. While cryotherapy was our treatment method of choice, there are several available options for ablating the remaining tissue endoscopically including laser ablation and electrocautery, but there is limited data comparing these modalities.

Yet another area of interest, and in need of further research, is the treatment of persistent papilloma requiring over 4 operative interventions in one year. In these instances, there is data on the use of adjuvant therapy, either intra-lesional or systemic, which has been shown to prolong time to recurrence<sup>3,4</sup>. Given the rate of conversion to squamous cell carcinoma, quoted at up to 5%<sup>1</sup>, there is some urgency in terms of defining effective treatment for this condition. The unique presentation of an accessory bronchus in conjunction with papillomatous growth adds further complexity to the literature on this unique disease process.

## Declarations

### Ethics approval and consent to participate

Not applicable to this study

### Consent for publication

Consent was obtained from the patient for publication of this case report

## Availability of data and materials

Not applicable to this study

## Competing interests

The authors declare that they have no competing interests

## Funding

Not applicable

## Authors' contributions

FS obtained the imaging and patient data and was also a major contributor to the manuscript. AA was the primary author of the manuscript. All authors read and approved the final manuscript.

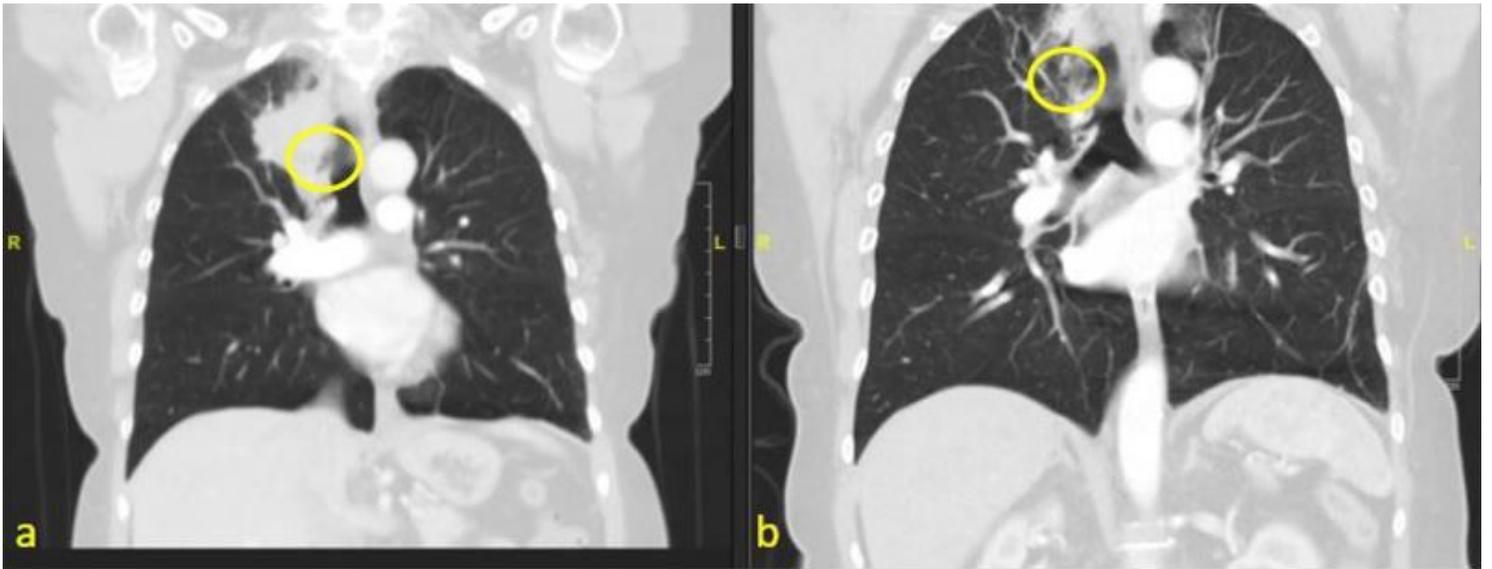
## Acknowledgements

Not applicable

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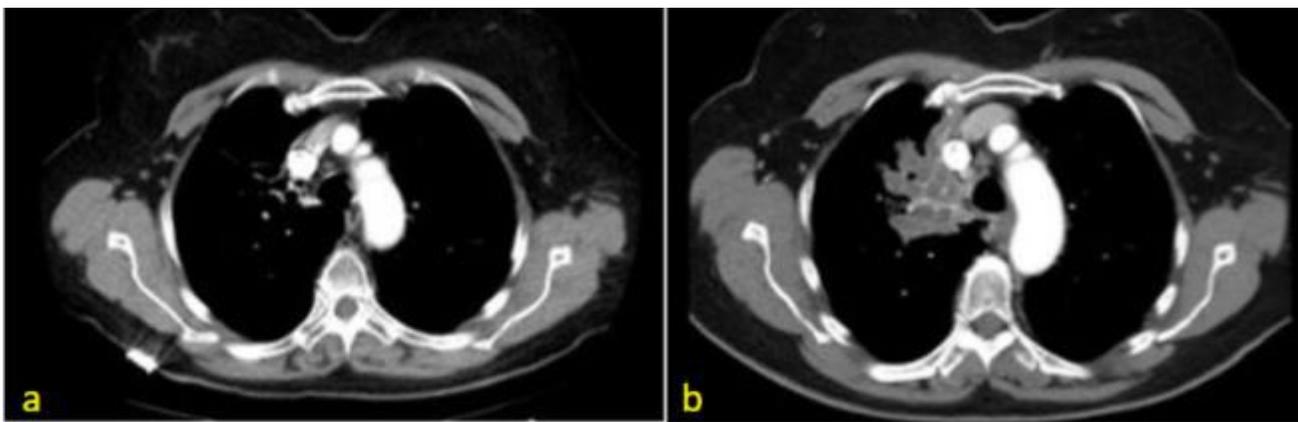
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## Figures



**Figure 1**

CT scan, coronal, comparing obstructed accessory bronchus before treatment (a) and patent bronchus after treatment (b)



**Figure 2**

CT chest, axial cut, comparing multi-loculated lesion in right upper lobe before (a) and after treatment (b)



### Figure 3

Image taken during bronchoscopy showing large papilloma obstructing accessory bronchus (a), application of cryotherapy to area (b), and patent airway after most recent cryotherapy treatment (c)

## Supplementary Files

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- [CAREchecklistEnglish2013.pdf](#)