Abstracts of the 5th IJMS WCMSR

01. **Bronchial Artery Embolization with N-butyl-2-cyanoacrylate for Hemoptysis: A Descriptive Single Center Retrospective Study about Safety and Efficacy**

Krishna Sahitha Tiruchirapalli [1] Dr Suresh Giragani [2]

[1] Final-year Medical Student. Apollo Institute of Medical Sciences and Research, Hyderabad, India. [2] MBBS. Apollo Health City, Hyderabad, India.

INTRODUCTION: Hemoptysis refers to the expectoration of blood from the respiratory tract. Its etiology varies by region, cystic fibrosis is the most common cause in the developed world while tuberculosis predominates in endemic regions. Depending on severity, it can be managed medically, surgically, or through endovascular embolization procedures. Massive hemoptysis, defined variably as 200-1000mL of blood per 24 hours or any bleeding with airway compromise has a high mortality rate of 50%-70% without intervention. Bronchial arteries are the main source of bleeding, and bronchial artery embolization (BAE) is a minimally invasive and effective treatment option. The most common embolic agent for BAE remains polyvinyl alcohol (PVA) particles, although N-butyl-2-cyanoacrylate (NBCA) offers advantages including rapid and complete occlusion and adjustable polymerization rates via adjustable glue-to-contrast ratios. **METHODS**: A single center retrospective study was conducted using data obtained from medical records and the Picture Archiving and Communication System (PACS), comprising 210 patients treated for hemoptysis via BAE using NBCA from 2014 to 2022.

Patients included underwent appropriate preprocedural workup and BAE via a standard procedure. Preprocedural imaging included CT thoracic angiography to identify underlying lung pathology, bleeder vessels, and pseudoaneurysms. All patients underwent BAE using a digital subtraction angiography unit and a standard procedure with femoral access using a 5F sheath. Selective catheterization of target vessels was achieved using a 5F angiographic catheter followed by coaxial microcatheter insertion for distal embolization to avoid non-target spread. The agent used was 15% NBCA mixture (1:7 glue-to-lipiodol ratio) with the endpoint being complete stasis.

The outcomes measured were technical success- catheterization and embolization of culprit vessels, immediate success- no fresh hemoptysis within 24 hours, recurrence at 3 and 6 months, and complications as per Society of Interventional Radiology (SIR) guidelines. **RESULTS**: The patient group comprised 154 male and 56 female patients with a mean age of 48 years. Tuberculosis was the most common etiology. Hemoptysis was categorized as mild (n=42), moderate (n=132), or severe (n=36).

A total of 693 vessels were treated- 606 bronchial arteries and 87 non-bronchial systemic collaterals, making an average of 3.3 arteries embolized per patient. Technical success was achieved in all cases (100%) with immediate clinical success seen in 208 patients (99%). Two patients succumbed to progressive pulmonary disease within three days.

At 6 months, 180 patients were evaluated with 22 lost to follow-up. Hemoptysis recurrence rates were 12.6% (n=23) at 3 months and 10.8 (n=20) at 6 months. Minor complications were observed in 33.8% (n=71) with self-limiting chest pain being the most common. Other minor complications were dysphagia and puncture site hematoma, which also resolved with conservative management. No major complications or procedure related mortality were noted. **CONCLUSION**: BAE with NBCA is a safe, effective, and affordable treatment method for hemoptysis. It demonstrates high immediate clinical success, low recurrence rates and low complication risk. These results are consistent with existing literature and suggest NBCA as a suitable alternative to PVA particles depending on operator experience.

Key Words: Bronchial Arteries, Hemoptysis, Tuberculosis, Bronchiectasis, Cystic Fibrosis

Figure 1: From left to right, top to bottom- 24-year-old female patient presenting with a history of moderate recurrent hemoptysis who underwent BAE. (a) Axial CT scan sections in lung window showing bronchiectasis in right middle and left lower lobes. Few bronchiectatic cavities show fluid level in left lower lobe. Also, there are centrilobular nodules in right lower lobe suggesting Active infection. (b) Coronal reformatted CT aortogram showing hypertrophied bilateral bronchial arteries and inferior phrenic arteries. Selective angiogram of the left bronchial (c) and common bronchial (d) arteries showing dilated tortuous arteries with hypervascular blush. (E) Post BAE chest xray film showing glue cast hyperdensities in the region of embolised arteries.


AO: 3.01 CRA: 1.38