



Case report

Subconjunctival haemorrhage from bronchoscopy: A case report



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ABSTRACT

Flexible bronchoscopy has been available for almost five decades. It has evolved as one of the most commonly used invasive diagnostic and therapeutic procedure in pulmonology, and its scope of applications is progressively expanding with the addition of new adjunct technologies such as endobronchial ultrasound, bronchial Thermoplasty, and navigational bronchoscopy. It is a safe procedure with complications ranging from fever, infiltrates, hypoxemia, bleeding, pneumothoraces and death, with most significant complications being bleeding and pneumothorax. We report a case of subconjunctival haemorrhage as an immediate complication of bronchoscopy. To our knowledge this is the first report documenting this rare complication.

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1. Introduction

The flexible bronchoscope was developed in 1960's. The first report was published by Dr S. Ikeda, the inventor of the instrument himself in 1968, which highlighted the greater extent of the airway visualised with flexible bronchoscope in comparison to the rigid bronchoscope with which it was difficult to visualise the bronchi of the upper lobes [1]. Since then, it has evolved as one of the most commonly used diagnostic and therapeutic procedures in the field of pulmonology [2]. Over the last 10 years, proliferation of new and adjunct technologies such as endobronchial ultrasound, navigational bronchoscopy, bronchoscopic lung volume reduction, bronchial thermoplasty, cryotherapy, electro-surgery, and optical microscopic imaging techniques have expanded the scope of bronchoscopy further to many more applications than what it was initially conceived for 50 years ago [3,4].

Searching a computerized database using “flexible bronchoscopy” as the medical subject heading term, and limiting it to publications from year 1968–1979, 1980–1990, 1990–2000, and 2000 to 2010, in English language, human species, and ≥ 19 years old adults, yields 24, 54, 107 and 246 articles respectively. This may

reflect doubling of flexible bronchoscopies performed every decade. It is envisaged that the application of bronchoscopy to benign diseases such as Asthma, chronic obstructive pulmonary disease (COPD), and adoption of Low Dose Computerised Tomography (LDCT) screening for lung cancer may further increase this number in the future [5].

As every invasive procedure, flexible bronchoscopy although safe is associated with complications. Reported complication rate is 0.08–1.08% [6]. These range from transient hypotension related to sedation, bronchospasm, hypoxemia, epistaxis due to the trauma of the nasal approach, nausea, vomiting, bleeding, pneumothorax, cardiac arrhythmias, infection, vasovagal syncope, laryngospasm, seizure, bacteraemia, methemoglobinemia, laryngeal oedema, and laryngeal injury. Apart from bleeding, and pneumothorax, most complications are minor and self-limiting [6]. With the expanding role of bronchoscopy, increase in the frequency and type of complications is foreseeable.

Subconjunctival haemorrhages, although conceivable due to its known association with coughing or any activities which cause a Valsalva manoeuvre, and bronchoscopy being known to invoke cough, has not been reported as a complication of bronchoscopy in the literature. We report a case of a subconjunctival haemorrhage as an immediate complication of bronchoscopy.

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1.1. Case presentation

A 61 years old Chinese male with past medical history of anti-phospholipid syndrome (APLS), and ischaemic heart disease with left ventricular thrombus on warfarin, was referred to us for evaluation of right lung mass on computed tomography (CT) of thorax (Fig. 1). Flexible bronchoscopy with transbronchial lung biopsy under moderate sedation was planned. Informed consent with explanation of the risk of bleeding, infection, pneumothorax, cerebrovascular event, cardiovascular event, inconclusive result requiring repeat procedure, and mortality was obtained. Being on warfarin, patient was also counselled for the bridging regime for anticoagulation prior to the procedure. Procedure was carried out after reversing the anticoagulation. Pre-procedure prothrombin time was 14.2 s, and International normalized ratio (INR) was 1.2.

During the procedure, patient was given moderate sedation with intravenous midazolam (4 mg) and fentanyl (50 mcg) in 2 equally divided doses titrated to patient's comfort. Patient's vital signs were monitored throughout the procedure. Flexible bronchoscopy was performed via the trans-oral route. Endobronchial lesion was seen over the orifice of right upper lobe and distal right bronchus intermedius (RBI). Bronchial washings and biopsy were done from RBI lesion. Bleeding was noted after biopsy requiring topical adrenalin and iced cold saline to achieve haemostasis. Apart from unexpectedly persistent cough during the procedure, patient tolerated procedure well. However, uncovering of the eyes after the bronchoscopy revealed a large subconjunctival haemorrhage in the patient's right eye (Fig. 2). Apart from this, he was asymptomatic with intact visual acuity. Family was alarmed and terrified in view of the redness of the right eye and expressed unhappiness as this was not communicated to them as a possible complication prior to the procedure.

He was admitted for further evaluation and monitoring. Post-procedure coagulation profile was normal (prothrombin time 13.9 s, INR 1.1, and platelet count 191,000/L). He was reviewed by the ophthalmologist and examination revealed a large subconjunctival haemorrhage of his right eye, underlying the entire examinable extent of the bulbar conjunctiva. Otherwise, the rest of the examination of his anterior and posterior segments was unremarkable. Patient and family were reassured on the findings and patient was discharged with outpatient follow up. Anticoagulation was recommenced 5 days after the bronchoscopy. The follow up visit in 1 weeks' time showed significant, although incomplete resolution of the subconjunctival haemorrhage (Fig. 3).

2. Discussion

Flexible bronchoscopy is considered to be a safe procedure. Complications have been documented and include transient hypotension related to sedation, bronchospasm, hypoxemia, epistaxis due to the trauma of the nasal approach, nausea, vomiting, bleeding, pneumothorax, cardiac arrhythmias, infection, vasovagal syncope, laryngospasm, seizure, bacteraemia, methemoglobinemia, laryngeal oedema, and laryngeal injury [6]. Hypoxemia can be prevented by supplemental oxygen. Transient hypotension usually responds to an intravenous bolus of normal saline and the cardiac arrhythmias are generally transient. Bleeding and pneumothorax occur in the context of transbronchial biopsy in 2.8% and 4% of procedures respectively with the higher risk in patients receiving clopidogrel alone or clopidogrel plus aspirin [6]. Fewer than half of the patients who develop a pneumothorax require a chest tube and most of the bleeding resolves with topical epinephrine. Procedure-related mortality is extremely rare (0.013% in one study) and associated with organic heart disease or severe airway obstruction [7].

Subconjunctival haemorrhages are themselves, a benign condition of the eye. It typically presents as a painless, well-circumscribed patch of redness seen underneath the conjunctiva, and results from bleeding from the conjunctival vessels or episcleral vessels into the subconjunctival space [8]. The patient's vision is usually not affected. Literature on subconjunctival haemorrhage from bronchoscopy is lacking although it has been reported post endoscopy [9,10]. In our case, a possible reason for the subconjunctival haemorrhage post bronchoscopy was violent cough mediated by contact of the bronchoscope with airway mucosa. Intrathoracic pressure rises in expiration and cough is mediated by forceful expiration. Sudden rise in the intrathoracic pressure causes sudden severe venous congestion of blood into the superior vena cava and head [11]. An additional risk factor that predisposed our patient to bleeding was the usage of anticoagulation, although this was reversed and both the pre, and post-procedure coagulation profile was normal, but could account for the extensive subconjunctival haemorrhage seen in this patient. Diseases associated with subconjunctival haemorrhage such as diabetes, hypertension, or systemic vascular disorders were absent in our patient except Anti-phospholipid syndrome. However anti-phospholipid syndrome is unlikely to have contributed to bleeding as it was well controlled in our patient, and it typically presents with thromboembolic thrombosis in contrast to haemorrhage. Ocular manifestations of APLS include retinal arteritis, retinal venous occlusion, ischaemic optic neuropathy, and transient loss of vision due to

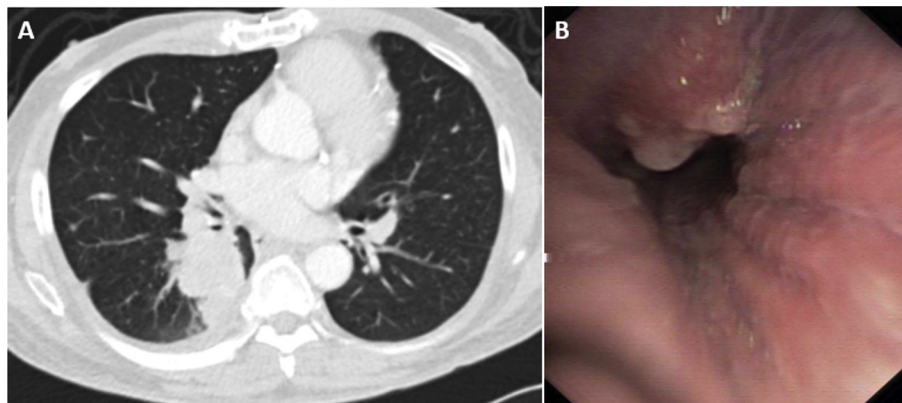


Fig. 1. A) CT scan showing the mass in the right lower lobe with extrinsic compression of bronchus intermedius. B) Bronchoscopy image showing the endobronchial lesion in the bronchus intermedius at the 12 o' clock position.

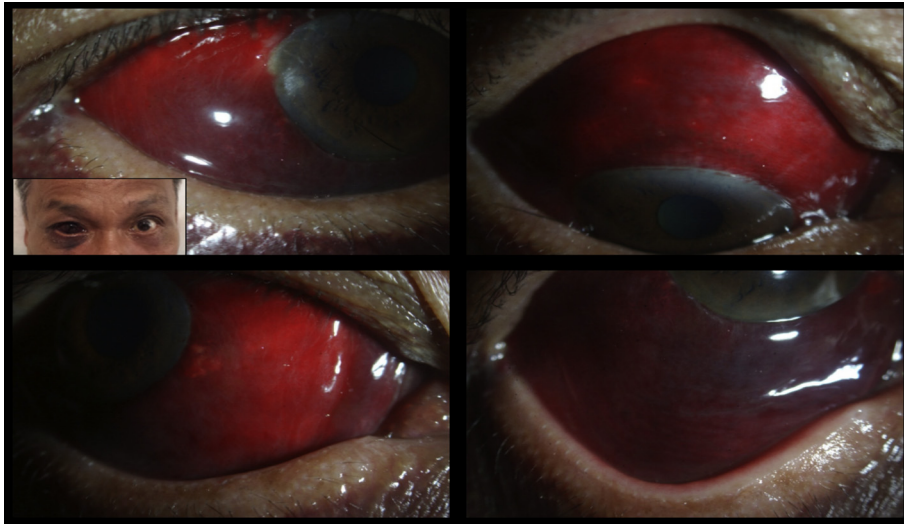


Fig. 2. Image of the patient's right eye showing subconjunctival haemorrhage.

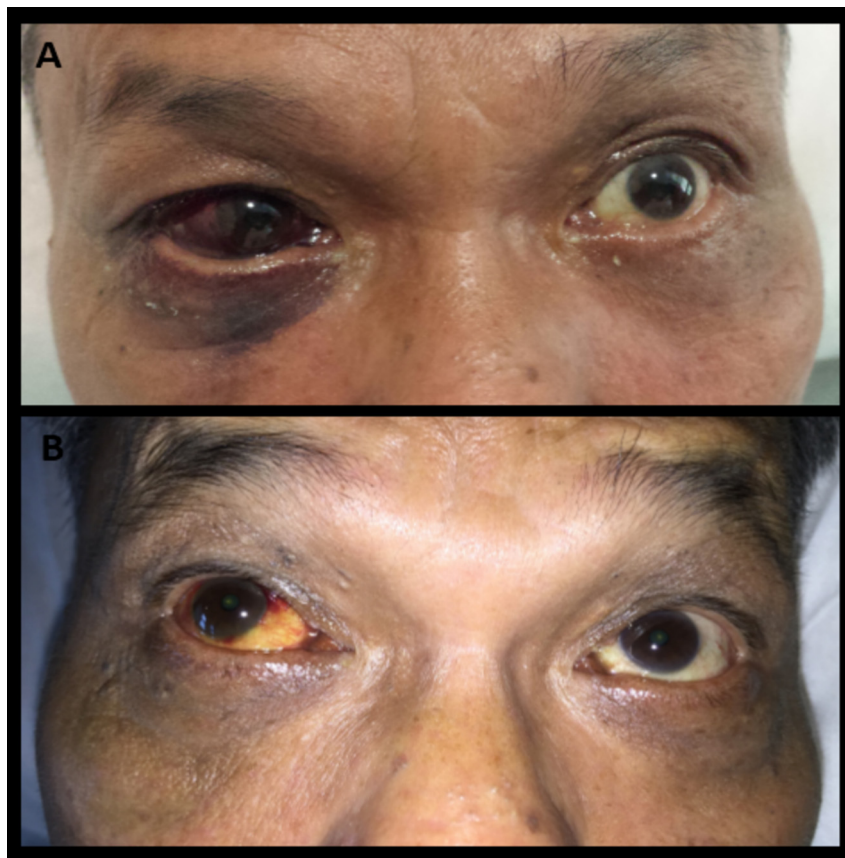


Fig. 3. A) Image of the patient's right eye immediately after the bronchoscopy showing subconjunctival haemorrhage. B) Image of the patient's right eye 1 week after bronchoscopy showing partial resolution of the subconjunctival haemorrhage.

amaurosis fugax.

We hospitalized our patient, for observation and referral to ophthalmologist. Although patient and family felt reassured after knowing the benign nature of the complication, they expressed concerns regarding lack of information provided to them regarding this potential complication.

In conclusion, as the number of bronchoscopies increase by

virtue of the expansion of the role of bronchoscopy, experiencing increase in the frequency and type of complications is foreseeable. Pulmonologists should be aware of and try to mention all possible complications at the time of obtaining informed consent. Patients on anticoagulation, despite discontinuation and normalization of their coagulation profile should be considered at risk of this complication. It may take up-to more than a week for the eye

findings to subside. The likelihood of this complication may be minimised by reversal of anticoagulation, pre-treatment with central cough suppressants, and ensuring adequate topical anaesthesia of the pharynx, larynx and tracheobronchial tree to blunt the cough reflex.

Conflict of interest statement

No conflict of interest to declare.

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