CASE REPORT

Unusual case of bilateral haemotympanum after endobronchial ultrasound-guided transbronchial fine needle aspiration (EBUS-TBNA)

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SUMMARY

We present a case of bilateral haemotympanum (HT) during endobronchial ultrasound-guided transbronchial fine needle aspiration (EBUS-TBNA). A 64 year-old-man underwent EBUS-TBNA for mediastinal lymph nodes (LN) staging. Medical history included emphysema and angina. Medication included aspirin until the day before procedure. Full blood count and clotting screen were normal. He received sedation (5 mg midazolam, 1000 mcg alfentanil) and topical anaesthesia (16 mL 1% lignocaine) but coughed excessively throughout the procedure. Left hilar LN was the only area sampled. Spontaneous bleeding ensued from both ears towards the end of the procedure. Patient remained haemodynamically stable. The procedure was aborted and otolaryngology consult sought. Otoscopy showed bilateral haematoma from anterior ear canal with normal tympanic membranes and no hearing loss. Nasendoscopy revealed erythematous ostium of both Eustachian tubes. Bleeding stopped spontaneously and patient required no further imaging or treatment. We report this case to increase awareness of this very rare complication resulting from excessive coughing during EBUS-TBNA.

conscious sedation (5 mg midazolam and 1 mg alfentanil) and topical anaesthesia (16 mL of 1% lignocaine). Despite this, the patient coughed excessively throughout the procedure. Left hilar lymph node was the only area sampled with three separate needle passes. Spontaneous bleeding was noted from both ears towards the end of the procedure, although the patient remained haemodynamically stable. EBUS-TBNA was aborted and an otolaryngology consult was sought.

INVESTIGATIONS

Otoscopy showed bilateral haematoma from anterior ear canal with normal tympanic membrane (TM) and no hearing loss. Nasendoscopy revealed erythematous ostium of both Eustachian tubes.

TREATMENT

Ear bleeding stopped spontaneously and patient required no further imaging or treatment. He was discharged home after a period of observation to otolaryngology follow-up.

OUTCOME AND FOLLOW-UP

The patient was subsequently followed up by otolaryngology at his local hospital. There were no further episodes of ear bleed and patient remained asymptomatic. There were no signs of hearing impairment or TM damage.

The cytology samples from EBUS-TBNA confirmed diagnosis of pulmonary adenocarcinoma. The patient underwent chemotherapy followed by radical radiotherapy and is under active oncology follow-up.

DISCUSSION

Bronchoscopy is a safe diagnostic procedure with minimal risk of serious complications, reported to be around 1.1% with a mortality of 0.02% in a large retrospective series.² EBUS-TBNA is now an established technique for the assessment of hilar and mediastinal lymph nodes for the diagnosis and/or staging of suspected lung cancer, lymphoma and extrathoracic malignancy and for diagnosis of non-malignant conditions like sarcoidosis and tuberculosis. AQuIRE database reported a complication rate of 1.44% in 1317 prospectively enrolled patients undergoing EBUS-TBNA.³ A recent review

BACKGROUND

Endobronchial ultrasound-guided transbronchial fine needle aspiration (EBUS-TBNA) is a relatively safe procedure with reported complication rate of 1.44%. It has been safely practised since 2003 when its usefulness was first reported.¹ Haemotympanum following EBUS-TBNA is not widely known and has only been reported once before with bronchoscopy. We report this case to increase awareness among respiratory physicians about this rare but frightening complication of an otherwise safe procedure.

CASE PRESENTATION

A 64 year-old-man underwent EBUS-TBNA for mediastinal staging of left upper lobe mass. He had background history of emphysema and angina. He did not take anticoagulants or antiplatelets other than aspirin. Recent full blood count, including platelets, prothrombin time/international normalised ratio and partial thromboplastin time, was normal. Positron emission tomography scan demonstrated avid left upper lobe mass with uptake in left hilar lymph nodes. He had adequate

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reported EBUS scope damage (36%), haemorrhage (20%), infection (19%), anaesthesia-related complications (11%), EBUS-TBNA needle apparatus malfunction (7%), pneumothorax (4%) and respiratory failure (3%) as the commonly reported EBUS-TBNA complications.⁴

Haemotympanum refers to bleeding within the middle ear cavity with an intact TM. Common causes of haemotympanum include blunt temporal bone trauma with/without basilar skull fractures, chronic otitis media with effusion (idiopathic), therapeutic nasal packing, anticoagulant treatment and bleeding diatheses. Less common causes include spontaneous epistaxis, carotid artery aneurysm, septoplasty and barotrauma to the middle ear due to abrupt rise in middle ear pressure rarely described in scuba divers.^{5–8} Barotrauma refers to tissue damage secondary to pressure changes that occur with change in altitude during air travel, deep sea diving and mountaineering.⁸

Haemotympanum after diagnostic bronchoscopy is extremely rare and to the best of our knowledge, only a single case has been reported in the literature.⁹ The mechanism postulated for development of haemotympanum after bronchoscopy is similar to barotrauma, with an abrupt rise in middle ear pressure due to excessive coughing.¹⁰ Our patient underwent EBUS-TBNA and had excessive coughing throughout the procedure despite adequate sedation likely leading to barotrauma associated haemotympanum. The cause of excessive cough in this case despite adequate sedation and local anaesthesia is likely due to hyper-reactive airways.

Patients with haemotympanum can present with ear fullness, otalgia and hearing loss apart from bleeding. Medical history should be elicited including fall or head trauma, history of ear infection/discharge, epistaxis with/without therapeutic nasal packing, nasal surgery, haematological conditions and history of air travel or deep-sea diving. Drug history including antiplatelet therapy, low molecular weight heparin, warfarin or newer oral anticoagulants should be undertaken. Otoscopy is usually diagnostic showing a typical dark blue/purple appearance of TM as a result of recurrent haemorrhage in the middle ear and Eustachian tube obstruction; it can also show bulging and congested TM and lack of movement during air insufflation.⁸ Our patient presented with spontaneous ear bleed during the EBUS-TBNA procedure performed via the oral route. He had a medical history of ischaemic heart disease for which he was on aspirin only. He had no associated symptoms prior to the planned procedure. Otoscopy revealed bilateral non-pulsatile haematoma from anterior ear canal with normal TM and no hearing loss. Nasendoscopic examination revealed erythematous ostium of both eustachian tubes.

Investigations for haemotympanum include full blood count with platelet levels and clotting screen. Audiogram may show conductive/mixed hearing loss due to the presence of blood in the middle ear cavity. CT head is indicated to rule out basal skull fractures and may pick up vascular malformation or bone erosion due to chronic otitis media or tumours. MRI scan is sometimes required to rule out a vascular tumour.⁵ Our patient had normal blood counts and clotting screen. No further imaging was deemed necessary as the symptoms resolved spontaneously in a matter of hours.

Treatment is usually conservative and aimed at treating the underlying cause if identified. Barotrauma-related

haemotympanum usually requires no treatment and resolves spontaneously within a few weeks. There is not much evidence on the role of antibiotics, corticosteroids or nasal decongestants. Surgery including tympanotomy or myringotomy is usually reserved for patients with persistent symptoms.¹¹ Our patient required no specific treatment and he was discharged after a period of observation, to otolaryngology follow-up at his local hospital.

Prognosis is excellent and most symptoms resolve spontaneously without requiring treatment. Hearing loss settles when the blood in the middle ear cavity is resorbed.¹²

Haemotympanum secondary to bronchoscopy or EBUS-TBNA is extremely rare and has only been reported in the literature once before. The purpose of this case report is to increase awareness among respiratory physicians of this rare complication of an otherwise safe procedure.

Learning points

- Endobronchial ultrasound-guided transbronchial fine needle aspiration (EBUS-TBNA) is a safe diagnostic procedure with minimal complication rate.
- Haemotympanum associated with EBUS-TBNA is a very rare complication which can arise following excessive coughing leading to abrupt rise in middle ear pressure.

Contributors UM and MIH performed the procedure. UM wrote the draft summary of case. MBG did the literature search and wrote discussion. MM proofread the report and suggested corrections. All authors reviewed the final case report.

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