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# **An Indonesian adolescent with delayed management of airway foreign body (straight pins) aspiration: A case report**

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**Abstract**---Foreign body aspiration (FBA) often causes a delay in management due to asymptomatic clinical manifestations, delay in seeking medical care, less competent medical personnel, and inadequate healthcare facilities.

**Keywords**---foreign body aspiration, bronchoscopy, human and health.

**Introduction**

Foreign body aspiration (FBA) is the entry of objects from outside or within the body into the airway [1, 2]. The types of foreign bodies can be classified into organic and inorganic. Examples of organic foreign bodies include peanuts or food, whilst the inorganic ones include plastic, teeth, metallic nuts, or needles [3]. FBA of straight pins is standard in Muslim countries [4]. Muslim women often use straight pins to make the hijab (Islamic veils) look neat. Women who use veils tend to place straight pins between their lips whilst tidying their hijabs. This may trigger accidental inhalation of the straight pins when talking, laughing, or coughing [4, 5]. Airway FBA is more common in children, with adult FBA accounting for 20% of cases [6]. Complications usually occur in chronic cases (after >30 days) of FBA [7]. Mainly delayed management of FBA included asymptomatic clinical manifestations, delay in seeking medical care, less competent medical personnel, and inadequate healthcare facilities [7, 8]. We are interested in reporting an Indonesian adolescent with delayed management of airway FBA, mainly straight pins. We report based on SCARE 2020 guidelines [9].

## Case presentation

A 16-year-old woman, an Indonesian adolescent, complained of coughing up brown-coloured bloody sputum five months ago. The complaint was accompanied by left-sided stabbing chest pain, which disappeared when coughing hard. The patient had a history of inhaling a straight pin approximately 18 months ago. She placed the straight pin between her lips whilst tidying her hijab, which accidentally resulted in inhalation of the straight pin when she laughed. She experienced severe coughing with a choking-like experience at the time of the incident. She visited a primary healthcare doctor two days afterwards and took a chest radiograph. The patient never went for a follow-up.

The physical examination was expected. A chest X-ray showed a metal-density foreign object in the left bronchus as high as the fifth to sixth thoracic vertebrae (Fig 1). The patient was diagnosed with airway foreign body aspiration of a straight pin in the left bronchus. Rigid bronchoscopy was performed two days following hospital admission. The patient was under general anaesthesia, and the procedure was initiated by inserting the rigid bronchoscope (size 6.5) using a laryngoscope. The bronchoscope was rotated 90 degrees clockwise as it passed through the vocal cord and was subsequently rotated 90 degrees counterclockwise after entering the trachea. The evaluation began from the trachea, carina, and continued to the left bronchus. A foreign body was found in the left superior lobar bronchus with its sharp tip pointing towards the proximal. The FB was surrounded by granulation tissue easily bled (Fig 2). The action was stopped, and the patient was performed to flexible bronchoscopy. Extraction of the FB using flexible bronchoscopy was carried out. Exploration using Olympus Fiber Bronchoscope BF-XP60 found the FB in the left superior lobar bronchus. Alligator forceps were used to extract the FB. After 93 minutes, an approximately 5 cm straight pin was successfully extracted (Fig 3). The exploration found granulation tissue with no bleeding and no foreign remains.

The patient was given Ceftriaxone antibiotic therapy of 1 g/12 hour and was discharged three days post-bronchoscopy. The patient was prescribed five hundred milligrams of Ciprofloxacin every 12 hours. One-week post-hospitalization, the patient returned for follow-up with no complaints of cough, fever, chest pain, and shortness of breath.

## Discussion

Most airway FBA occurs in children, although 20% of cases occur in adults in Saudi Arabia [6, 10]. The type of foreign body (FB) is related to customs, traditions, and work, in which cases of straight pin FBA were reported in many Muslim countries [4, 5]. The incidence increased amongst young Muslim women due to their carelessness. Muslim women tend to place them between their lips. Hence, less attention accompanied by laughter, talking or deep breathing whilst tidying the hijab may cause accidental inhalation [4, 5, 11]. Hamad *et al.* reported that 81% of patients with FB would seek healthcare within 24 hours, and 19% would come after several days assuming the FB was ingested [11]. Patients tend to ignore the history of aspiration after the acute symptoms are resolved since they consider the symptoms harmless [3, 7, 8, 12]. Altogether, delayed diagnosis

of FBA in low setting resources is related to a lack of resources and health awareness [13].

The patient's complaint of haemoptysis for 5 months in the present case suggests that the patient had good health condition since she could tolerate the FB for quite a long without showing life-threatening complications. A case in Turkey reported patients with hemoptoe showing tuberculosis-resembling cavitation [14]. Additionally, FB-triggered endobronchial actinomycosis that resembled bronchogenic carcinoma was reported in Korea. FBs predispose lungs toward bacterial and fungal infections [10]. In terms of diagnostic modalities, metallic FBs would appear radiopaque in 5-15% of posterior-anterior and lateral chest radiographs [5, 15]. The chest radiographs often show pulmonary infiltration, atelectasis, hyperinflation, bronchiectasis, or even normal appearance (21-24%) [8]. CT scan has better sensitivity and specificity in diagnosing radiolucent FBs and ruling out suspicion of tracheobronchial FBs, which may help the operator estimate the FB extraction technique [4, 12, 15]. Diagnostic bronchoscopy is recommended in patients with a history of FBA despite regular physical examination and chest radiographs [8, 16].

Bronchoscopy is a diagnostic and therapeutic modality for cases of airway FBs. Rigid bronchoscopy with magnifying telescope produces superior visualization and adequate ventilation, which is recommended in managing FBA, including those with complications such as hemoptysis, surrounded by granulation tissues, or sharp FBs requiring certain manoeuvres [11, 15]. The success rate of rigid bronchoscopy reached 90.4% in the first attempt in Egypt [11, 17]. Ganie *et al.* reported 52/55 patients with successful extraction, whilst 3/55 patients underwent thoracotomy [18]. Flexible bronchoscopy is relatively more accessible and safer under an experienced operator. The mortality rate declined from 12% to 1% with flexible bronchoscopy compared with rigid bronchoscopy [15, 17]. A systematic review showed a successful extraction rate of 61-100% with flexible bronchoscopy compared with 3-40% with rigid bronchoscopy [3, 19].

The wound healing process comprises four stages: haemostasis, inflammation, proliferation, and maturation. The granulation tissue is formed during the proliferative stage, serving as an essential component. Granulation tissue is a proliferation of fibroblasts, keratinocytes, endothelial cells, thin-walled capillaries, and infiltration of inflammatory cells from the extracellular matrix [20]. The granulation tissue can either resolve or use fibrotic tissue, which results in stenosis [6].

## **Conclusion**

Delayed diagnosis of foreign airway body (a straight pin) in the secondary left bronchus was extracted using flexible bronchoscopy with complications of granulation tissue with no sequelae. Early management of airway FBA is essential to prevent complications that risk increasing mortality.

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