

Accidental inhalation of scarf pin: Presentation and management

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ABSTRACT

Background: The accidental aspiration of foreign bodies (FBs) is a rare occurrence in adults. However, inhalation of scarf pin is a phenomenon more and more common in the context of Muslim nations. The aim of our study was to describe the characteristics of this particular FB and illustrate the circumstances and consequences of inhalation. **Methods:** This retrospective study involved patients with a history of scarf pin aspiration admitted to the Thoracic Surgery Department of Mohammed VI University Hospital Center, Oujda, Morocco, over a period of 10 years. Their main presentation, diagnosis, treatment, and outcome were analyzed. **Results:** The average age of the 30 cases was 18 years (13–43). No antecedent was found in all cases. The penetration syndrome was found in all cases, with a transient moment of suffocation in 19 cases (63.33%), a dry cough in 15 cases (50%), minimal hemoptysis in 4 cases (13.33%), and purulent sputum in 3 cases (10%). The clinical examination was normal in all cases. The chest X-ray showed the FB in the form of linear right sided opacity in 14 cases (46.66%), left sided in 8 cases (26.66%), and in the trachea in 8 cases (26.66%). Rigid bronchoscopy visualized the scarf pin at the level of the right basal pyramid in 5 cases (16.66%) and on the left side in 2 cases (6.66%), at the level of the main right and intermediate trunk in 7 cases (23.33%), at the level of the left main bronchus in 4 cases (13.33%) and in the trachea in 5 cases (16.66%). The pin was extracted by rigid bronchoscopy in 23 cases (76.66%) and was expelled spontaneously in 5 cases (16.66%). Thoracotomy was required in 2 cases (6.66%). Medical treatment, including antibiotic therapy and short-course oral corticosteroids, was administered in all cases. **Conclusion:** Scarf pin inhalation is common in women who wear the Islamic headscarf. Bronchoscopy is an important tool to manage these FBs, but the best prevention treatment is careful handling of these potentially sharp objects away from the mouth.

KEY WORDS: Airway management, imaging, inhalation, rigid bronchoscopy, scarf pin

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INTRODUCTION

Inhalation of foreign bodies (FBs) is a rare occurrence in adults. Inhalation of scarf pin is a phenomenon more frequent in the female population in Morocco.^[1]

The aim of our study was to clarify the risk of holding a scarf pin in the mouth and to describe the characteristics of this particular FB and illustrate the circumstances and its management.

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METHODS

Thirty young patients all veiled were hospitalized in the Thoracic Surgery Department of Mohammed VI University hospital center, Oujda, Morocco, between January 2009 and February 2019 for inhaled scarf pin.

The mean age was 18 years (range 13–43 years). Inhalation was accidental in all cases, whereas patients initiated to wear the veil.

No risk factors was found (including neurological deficits with swallowing difficulties or psychiatric disorders, neuromuscular disease, poor dentition status, intoxication, or have an iatrogenic cause).

Patients were subjected to the preoperative neck and chest X-ray. The data collected from each patient included time interval between inhalation and presentation to our hospital, presentation symptoms, physical signs, radiological findings, bronchoscopic findings (location of the pin in the tracheobronchial tree, technique of removal, complications if any) and data were tabulated for analysis.

Rigid bronchoscopy (Karl Storz Endoskope system) of various sizes (5, 6, 6.5, 7.5, 8.5) with optical grasping forceps for use with HOPKINS® telescope were performed in an operating room setting under general anesthesia after proper preoperative assessment and anesthetic evaluation including an informed consent. After giving supine position, the bronchoscope was introduced by classic technique under standard anesthetic monitoring and assisted ventilation. The FB was visualized and retrieved by grasping forceps of appropriate length and design. When extraction with rigid bronchoscopy failed, posterolateral thoracotomy was performed. Patients who underwent successful rigid bronchoscopy were hospitalized for 24 h. Those who underwent classic thoracotomy were discharged from the hospital after the total expansion of both lungs and removal of the chest tubes.

RESULTS

A total of 30 pearl pin FBs were seen during 10 years. The mean age of patients was 18 years (range 13–43 years).

The patients wore headscarf which was secured by means of 2–3 cm metallic pins with pointed on one end and plastic knob of various shapes, sizes, and color [Figure 1]. Inhalation happened accidentally while patients tried to place pins in their scarf and held one or more pins in the mouth between the lips and teeth. Almost all patients with scarf pin aspiration reported that the event had been induced by talking, laughing, coughing, sneezing, or taking a deep breath at the time of accident.

The average duration of reporting to our emergency department was 2 h with delayed presentation ranging



Figure 1: Scarf pin is a 2–3 cm long metallic, pointed on one end and with a spherical plastic cover on the other

from 24 to 48 h.

The penetration syndrome was found in all cases, with suffocation in 19 cases (63.33%), a dry cough in 15 cases (50%), minimal hemoptysis in 4 cases (13.33%), and purulent sputum in 3 cases (13.33%).

The clinical examination was normal in all patients. The chest X-ray showed the FB as a linear opacity, located on the right in 14 (46.66%) cases, on the left in 8 cases (26.66%) and 8 (26.66%) in the trachea [Figures 2 and 3].

Bronchoscopy visualized the scarf pin at the level of the right basal pyramid in 5 cases (16.66%) and on the left side in 2 cases (6.66%), at the level of the main right and intermediate trunk in 7 cases (23.33%), at the level of the left main bronchus in 4 cases (13.33%), and in the trachea in 5 cases (16.66%). Inflamed bronchial mucosa was seen around the seat of the FB in 12 cases (40%). The FB was visualized and retrieved by grasping forceps of appropriate length and design in 23 cases (76.66%) [Table 1].

Three pearl pins (10%) were seen initially in the trachea on chest x-ray; one pin (3.33%) in the right main bronchus and one (3.33%) in the left main bronchus. These pins were spontaneously expectorated outside during a coughing effort or/and swallowed into the esophagus and were found in abdomen on a repeat postoperative X ray or were shown in Table 1. These patients were referred to the gastroenterology department for further management.

However, 2 patients (6.66%) were operated by posterolateral thoracotomy under general anesthesia with elective intubation after unsuccessful rigid bronchoscopy removal due to very distal migration of the FB. The intraoperative pin's localization was based on careful palpation of lung parenchyma searching for the plastic ending. The removal of pin was performed by the incision of the parenchyma or pneumotomy [Table 1]. Postoperative recovery was uneventful, and patients were discharged from the hospital

Table 1: Location of scarf pin in tracheobronchial tree and techniques for extraction

Anatomic site	On		Method of extraction	
	radiography	On bronchoscopy	Pins spontaneously expectorated outside during a coughing effort or/and swallowed into the esophagus	Surgical extraction due to very distal migration of the FB
The right basal pyramid	6	5	1	
The left inferior lobar bronchus	3	2	1	
The main right and intermediate trunk	8	7		1
Left main bronchus	5	4		1
Trachea	8	5	3	
Total	30	23	5	2

FB: Foreign body

**Figure 2:** Chest radiographs showing a headscarf pin in the trachea

after the total expansion of both lungs and removal of the chest tubes.

DISCUSSION

Intrabronchial FB inhalation (FB) is a serious and frequent problem in children compromising vital functions.^[1,2] There are two peaks in the incidence of FBs, between 1 and 3 years and in adults above 50-year-old, due to inadequate function of airway protective mechanism due to central nervous system disorders, mental health problems, facial trauma, intubation, or poor dental status. Furthermore, some professions expose to FB inhalation such as dressmakers, shoemakers, and carpenters.^[3,4]

Inhalation of FBs is uncommon in adults. The nature of the FB depends on regions, sociocultural conditions, eating, and even clothing habits.^[1,2]

The scarf pin is a FB that is particularly common in Islamic countries, among young and adolescent veiled girls who are usually both less skilled and much less attentive than older women in controlling and adjusting the headscarf. The majority of our patients were young teenagers who were introduced to the port of sail. The standard size of scarf pins is approximately 2–3 cm, with colored plastic head and pointed steel end.^[1,3]

**Figure 3:** Chest X-ray revealing a transversely impacted headscarf pin in the left main bronchus

To fix the veil on their head, the patients hold two or three pins between teeth or lips to get a free hand while doing or undoing headscarf. This maneuver may predispose patients to inhale easily and accidentally the pin, especially while talking, coughing, laughing, or breathing deeply at the time of the accident.^[2,5]

The right main bronchus has a predilection for FB inhalation because it is wider than the left, and the right main bronchus has a more direct extension of the trachea than the left main bronchus.^[1,3,4] However, this was not the case for other series.^[1,2]

Patients present the moment of inhalation a penetration syndrome (sudden suffocation episode, coughing, and dyspnea), then become asymptomatic after a period of intense cough testifying the nonasphyxiant nature of this FB. The major risk is the untimely mobilization of this sharp object.^[4] Even rarer, as a sharp object, scarf pin can penetrate through the bronchial wall and stuck to the lung parenchyma.^[6] Unlike other organic FBs, headscarf pin aspirations tend to be easily diagnosed by X-ray chest due to its radiopaque nature.^[1,4]

Complications due to inflammatory reaction with granuloma formation into the bronchial tree are related to the prolonged delay between inhalation of the FB and its removal.^[5]

Table 2: Some publications of headscarf pin inhalation with methods of extraction

Authors	Country of study	Year of publication	Number of cases	Method of extraction				
				FOB	RB	Surgery: Thoracotomy or thoracoscopy	Bronchoscopic technique using a magnet	Pins spontaneously expectorated or got coughed back into abdomen
Zaghba <i>et al.</i> ^[1]	Morocco	2013	26	21		2		3
Rizk <i>et al.</i> ^[12]	Egypt	2014	83		78			5
Fenane <i>et al.</i> ^[5]	Morocco	2015	28					28
Elsayed <i>et al.</i> ^[13]	Egypt	2015	20				20	
Baram <i>et al.</i> ^[10]	Iraq	2017	27	12	13			2
Dar <i>et al.</i> ^[11]	India	2017	36	2	31			1

FOB: Fiberoptic bronchoscopy, RB: Rigid bronchoscopy

FB aspiration and its evolution can lead to complications such as obstructive emphysema, recurrent pneumonia, bronchiectasis, pulmonary abscess, and even pleural effusion. However, the slender architecture of the scarf pin rarely causes obstruction and stasis. This Sharp-pointed object stuck in the bronchus and has a higher risk of perforation further predisposes to hemothysis, pneumothorax and/or pneumomediastinum.^[5,7-9]

Early extraction of these scarf pins is essential since one end of these objects is pointed and may become embedded in the bronchial mucosa during intense coughing or deep breathing. These pins may also migrate to the distal airways and evade to bronchoscopic visualization.^[4,5]

Diagnostic bronchoscopy is rarely needed; rather, a therapeutic intervention is required. Rigid bronchoscopy remains the procedure of choice for sharp or pointed FBs because it reduces the risk of perforation of the air passage and bronchial injury. Moreover, it offers superior airway control, suction, and extraction capabilities. An endoscopic crocodile forceps is used for extraction.^[3,6,10]

Rigid bronchoscopy is also safer because, during this procedure, the patients can be ventilated, and FB can be easily extracted.^[10,11] It also becomes, the procedure of choice should significant hemorrhage occur during extraction because it is impossible to simultaneously suction and manipulate the object with flexible bronchoscopy.^[3,10,11]

Dar *et al.* reported successful removal of 31 headpins using rigid bronchoscopy [Table 2].^[11] In our series, 23 FBs were removed utilizing rigid bronchoscopy without any complication. However, there are studies suggesting fiber optic bronchoscopy, as well as the case of Zaghba *et al.*^[1] who used Flexible bronchoscopy to extract the pin in 21 cases [Table 2]. Flexible bronchoscopy is more accessible, and general anesthetic is not required compared with rigid bronchoscopy,^[1,2] but the preservation of the cough reflex is potentially helpful in the migration of the pin too far distally.^[12,13] The potential of FB migration and piercing the bronchial membrane should be considered before any extraction using a flexible bronchoscope.^[6,7]

Bronchoscopy is not successful, especially if the FB is distally located; hence, Elsayed *et al.* performed a novel

technique using homemade magnets built on the tip of the rigid bronchoscopic suction for the extraction of 20 tracheobronchial headscarf pins [Table 2]. The use of magnetic force to remove metallic pins that have migrated beyond the rigid bronchoscopic view into terminal airways can be forced into a more proximal location and be extracted through the magnet or using the classic crocodile. This may avoid the need for surgical thoracotomy/video-assisted thoracoscopic surgery (VATS), where pin penetration has not yet happened.^[13,14]

In few cases, the metallic pin travels beyond the tertiary airway level, and a mini-thoracotomy or VATS is necessary for extraction.^[5-7]

The intraoperative pin's localization is based on careful palpation of lung parenchyma searching for the plastic ending. It is usually easy to find when the affected lung is collapsed. However, if palpation alone is insufficient additional intraoperative radiology should be necessary.^[5,7]

In the study of Fenane *et al.*, 28 patients were operated for surgical removal of a scarf pin inhaled by accident after unsuccessful endoscopy due to very distal migration of pins and/or their embedding in the bronchus wall with penetration of the lung parenchyma [Table 2].^[5]

The management of scarf pin inhalation requires a multidisciplinary team, and the outcomes for most patients after the extraction of this FB are excellent.^[1,7,9,10,15]

CONCLUSION

The use of the scarf pin is a sociocultural practice that carries serious health risks. This particular FB is more common among women who wear the Islamic veil. The best treatment is preventive by avoiding to bring in the mouth sharp objects.

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Conflicts of interest

There are no conflicts of interest.

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