Turban Pin Aspiration: New Fashion, New Syndrome

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OBJECTIVES/HYPOTHESIS: Turban pin aspiration syndrome is a new clinical entity afflicting young Islamic girls wearing a turban. The goal of this study was to present our experience in diagnosis and treatment of this new entity, define its clinical and epidemiologic features, and shed a new light on the role of fashion in the increased incidence.

STUDY DESIGN: A retrospective study in a tertiary university hospital.

METHODS: Review of clinical parameters and epidemiologic features of 26 patients diagnosed with turban pin aspiration syndrome admitted to the Hadassah-Hebrew University Hospitals in Jerusalem from 1990 to 2010.

RESULTS: All patients were Muslim females with an average age of 16 years. In all cases, the history was positive for accidental aspiration. Most of the pins were located in the trachea (42%). In 20 cases, the pins were extracted by rigid bronchoscopy without major complications. Fluoroscopy-assisted rigid bronchoscopy was used successfully in three cases. In one case, the object was self-ejected by coughing before the bronchoscopy, and two patients were referred to the chest unit for thoracotomy.

CONCLUSIONS: Clinicians should be aware of this distinct form of foreign body aspiration, its method of diagnosis, and extraction techniques. A cultural investigation showed a difference in the turban-fastening technique of young girls compared with their mothers. Removal by rigid bronchoscopy is a safe method with a high success rate and should be considered as the preferred extraction method of choice.

KEY WORDS: Turban pin, aspiration, bronchoscopy, foreign body.

LEVEL OF EVIDENCE: 4

INTRODUCTION
Forty years ago, foreign body (FB) aspiration, generally seen in children, is rare in teenage and adult populations. However, in the last 2 decades, a new and distinct group of tracheobronchial FB aspirations has increasingly been recognized in older patients. Turban pin aspiration syndrome is a new clinical entity afflicting young Islamic girls wearing a turban (hijab, or traditional headscarf). Sharp needles or pins are used to attach the layers of the hijab to each other to secure them in place around the head. While arranging the hijab, the pins are frequently held between the lips and thus may be accidentally aspirated or swallowed. They are usually recovered by direct laryngoscopy, bronchoscopy, or esophagoscopy. Although complications are minimal, in some cases, in which the pins are imbedded in soft tissue or become unreachable by endoscopy, the patient must undergo extraction by an external approach or by thoracotomy.

The goal of this study was to determine the epidemiologic features of this phenomenon and to describe our experience with this unique form of FB aspiration, including our insight into the role of fashion in recent years.

MATERIALS AND METHODS
A retrospective descriptive study was performed, using a computerized coding system to determine all cases of FB aspiration admitted to the Hadassah-Hebrew University Hospitals in Jerusalem, from 1990 to 2010.

The medical files of all cases of turban pin aspiration were reviewed. Parameters analyzed included age at presentation, sex, circumstances of aspiration, method of diagnosis, anatomic location of the FB, and early or late complications.

RESULTS
Over a 21-year period, a total of 26 cases of turban pin aspiration were identified. All cases occurred after 2001. The clinical characteristics of the patients are summarized in Table I.

All patients were Muslim females with an average age of 16 years (range, 12–33 years). Only two patients were more than 20 years old. In all cases, the history was positive for accidental aspiration of a needle or pin held between the lips during arrangement of a headscarf. All patients were referred to the emergency room within 24 hours of the aspiration.

There were no remarkable findings on physical examination. Diagnosis was confirmed in all cases by meticulous medical history and chest x-ray films, which showed that most pins were located in the trachea (42%), seven were in the right lung (27%), and, surprisingly, eight were in the left lung (31%).
In one case, the object was self-ejected by coughing before treatment. In 20 cases, the pins were extracted by rigid bronchoscopy alone. The procedure was performed with patients under general anesthesia in the operating room using a ventilating bronchoscope equipped with a 0-degree rod telescope (Karl Storz, Tuttlingen, Germany). Most pins were removed by optical forceps. Removal was done using a thin grasping (alligator) forceps through the rigid bronchoscope. There were no complications.

In two cases, rigid bronchoscopy was performed following esophagoscopy at another hospital. In both cases, the object was found in the lung despite a misleading posteroanterior film. Correct diagnosis was made after the negative esophagoscopy when a lateral film revealed the correct location. Failure to obtain the lateral films led to an unnecessary bronchoscopy in two other cases not included in this series because the pins were in the esophagus. In these cases, rigid esophagoscopy was performed immediately after bronchoscopy failed to localize the pins. Both pins were removed through the rigid esophagoscopy by a long alligator grasping forceps.

In three cases, fluoroscopy was used to assist removal of pins lodged in distal bronchi, where the endoscope or telescope could not enter. In one of these cases, it should have been suspected by taking a closer look at the chest films before entering the operating room. In this case, the initial evaluation of the chest x-ray before the procedure indicated that the object was lodged in the right main bronchus. However, the distance from the diaphragm suggested that it was situated deeper in the bronchial tree (Fig. 1) and had already entered the right lower lobe (Fig. 2). In all three cases of fluoroscopy-assisted rigid bronchoscopy, a rigid bronchoscope was advanced to the most distal bronchi possible. A thin grasping forceps was then advanced up to the object under fluoroscopy, and the FB was extracted through the bronchoscope without further complications.

In two cases, rigid bronchoscopy was performed after failure of a previous attempt of FB removal by flexible bronchoscopy. In one of these cases, the object was retrieved with no further complications. In the other case, the object was not retrieved and was found to be in the mediastinum following a computed tomography scan. The patient was then referred to the cardiothoracic department for a thoracotomy.

An additional patient was referred to the cardiothoracic department for thoracotomy after rigid and flexible bronchoscopy performed at another hospital failed to retrieve the object. The object was judged unreachable by endoscopy and a decision was made not to attempt a third bronchoscopy or a fluoroscopy-assisted rigid bronchoscopy.

![Fig. 1. Posteroanterior view chest x-ray of two patients before pin removal. In both films, the pin appears to be in the right main bronchus, but the distance from the diaphragm dome (arrows) suggests otherwise. (A) Pin in right main bronchus extracted by rigid bronchoscopy. (B) Pin in distal bronchi requiring fluoroscopy for foreign body to assist the rigid bronchoscopy retrieval.](image-url)
The average hospital stay was 2.72 days (range, 2–5 days). One event of pneumonia was treated with intravenous antibiotics for an additional 4 days.

**DISCUSSION**

Removal of solid FBs begins by taking a comprehensive history, followed by a physical examination and a critical review of all available imaging results. In the case of pin extraction, the importance of careful review of chest x-rays cannot be overstated. Both posteroanterior and lateral films must be obtained and meticulously evaluated before the procedure. Failure to obtain or properly evaluate the lateral films led to an incorrect diagnosis and an unnecessary esophagoscopy in two cases and an unnecessary bronchoscopy in two other cases.

Interestingly, in our series, the pins were equally distributed between the two lungs. In regard to anatomy, one would expect a predisposition toward the right side, yet when sharp and thin foreign objects are concerned, it seems that equal distribution is the norm, as presented in other studies.5,7,8

Our results indicate that rigid bronchoscopy is a safe and effective way of extracting aspirated pins when the pin is accessible by rigid instruments (92.3%). Flexible bronchoscopy was attempted twice in another department, with little success. A recent report summarizing the published data dealing with sharp FB aspiration showed that rigid bronchoscopy was the treatment modality of choice.7 However, two studies have claimed that flexible bronchoscopy is the preferred treatment modality.9,10

We believe that solid FBs should be removed by rigid bronchoscopy because it is a safe procedure when performed by experienced physicians; it allows control of the airway, and it requires less training than flexible bronchoscopy. Another advantage in cases of thin needle-like FBs is the ability to remove the FB through the bronchoscope by seating the sharp end inside the bronchoscope while removing it from the lung. Flexible bronchoscopy is a feasible alternative when the treating medical team is sufficiently experienced in solid FB removal owing to a high-volume caseload.

Fluoroscopy-assisted rigid bronchoscopy is a technique that is traditionally used for removal of pins lodged in distal bronchi, where the endoscope or telescope cannot enter.7 In a recent publication, two patients underwent a thoracotomy for pins lodged in small...
segmental bronchi after unsuccessful repeated rigid bronchoscopies. Fluoroscopy was not used. Based on our experience and on publications from high-volume centers, thoracotomy should be reserved for cases in which the pin has penetrated the lung parenchyma or migrated into the mediastinum. The use of fluoroscopy-assisted rigid bronchoscopy in our series spared three girls from open thoracotomy. It is a safe and easy alternative for extraction of distally lodged FBs. Critical review of imaging results is imperative to prepare the operating room setup for possible fluoroscopy and to minimize the need for a second procedure.

The reason for the emergence of the turban pin aspiration syndrome in the last 2 decades around the world, and during the last decade in Israel, was unclear, as the hijab has been worn throughout the Islamic world for centuries. Cultural investigation revealed a difference in the turban-fastening technique between young Muslim girls compared to their mothers. Older women use traditional fastening methods, safety pins, or snap fasteners, but the newer fashion trend is to use sharp pins for holding the turban tightly in place (Fig. 3). Because young girls are greatly influenced by fashion trends, they tend to use sharp pins more often than older women. With age also come experience, and therefore the danger of aspirating or swallowing pins would be expected to decrease. This could explain why the occurrence of aspirating or swallowing pins would be expected to decrease. This could explain why the occurrence of turban pin aspiration has risen so steeply in recent years and why it almost exclusively affects young girls. As always, preventing a problem is better than having to treat it. This issue calls for a higher degree of involvement and guidance by older women in teaching safe fastening techniques to adolescent girls.

CONCLUSION

Until such time that a new fashion trend arrives, clinicians should be aware of this distinct form of FB aspiration, its method of diagnosis, and extraction techniques. Careful preoperative interpretation of chest x-rays is obligatory. A lateral film should be obtained to distinguish swallowed pins from aspirated ones. Pins may lodge in both sides of the lung. The distance from the diaphragm dome may suggest whether fluoroscopy is required. Removal by rigid bronchoscopy is a safe method with high success rate and should be considered as the preferred extraction method of choice.

BIBLIOGRAPHY