



## The Pattern, Presentation and Management of Pardah Pin Inhalation: Report from a Single Center in Northern India

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### ► ABSTRACT

**Objective:** To describe the clinical characteristics, presentation and management of Pardah pin inhalation in female teenagers of single center in northern India.

**Methods:** This was a prospective cross-sectional study being performed in department of cardiovascular and thoracic surgery of Sher-i-Kashmir institute of medical sciences located in northern India from January 2009 to December 2012. We included 36 female patients with Pardah pin inhalation who were admitted to our center during the study period. All patients underwent rigid bronchoscopy under local or general anesthesia. We recorded the baseline characteristics including the demographic information, the site of the pin and clinical findings as well as the management strategies and the outcome of these patients.

**Results:** All patients were female using scarf to wrap their head and neck as religious obligation. Mean age of the patients was  $14.3 \pm 3.6$  years. The most common symptom was choking followed by cough being reported in all (100%) and 31 (86.1%) patients respectively. Bronchoscopy was successful in removing the pin in 31 (86.1%) patients. Pins were located in right main bronchus in 20 (55.5%) patients, and in left main bronchus in 10 (27.7%) patients. There was no mortality in our series. Pin was removed in 31 (86.1%) patients with the help of bronchoscope, but 5 (13.9%) patients needed bronchotomy for removal of the pin. Average hospital stay was  $12.43 \pm 1.6$  hours.

**Conclusion:** Rigid bronchoscopy is an ideal approach in management of Pardah pin inhalation. However some patients may need bronchotomy to remove the Pardah pin.

**Keywords:** Pardah pin; Rigid bronchoscopy; Computed tomography.

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### Introduction

Foreign body aspiration claims thousands of lives each year, because they are rarely managed in time for intervention [1]. Foreign body aspiration is regarded as the 4th leading accidental cause of death under 3 years of age and considered as the 3rd cause of death under 1 year of age [2,3], and it usually occurs in children under 3 years of age [4,5]. High

degree of suspicion was needed to diagnose foreign body inhalation, if there is no associated history. But sometimes X- Rays may be inconclusive and bronchoscopy is the ultimate procedure to exclude foreign body [6,7]. Kashmir valley is a Muslim dominated state with a population of over 10 millions. The young Muslim teen age girls use scarf over their head as a religious obligation. This scarf is wrapped

around head and neck and tied with a scarf pins called Pardah pin (Figure 1) in local language. On wrapping or removing scarf, most girls keep the pins between their lips, and by taking deep breath accidentally, the pins are inhaled. This was the mechanism described by most of our patients. It is an accidental and sudden occurrence and needs urgent intervention. Rigid Bronchoscopy (using rigid ventilating bronchoscope) is a life saving procedure for removal of pins in emergency situation. Our institute is the only tertiary care centre of the valley where rigid bronchoscopy is carried out for foreign body aspiration. Herein, we analyzed the pattern, presentation and results of rigid bronchoscopy for Pardah pin inhalation.

## Materials and Methods

### Study population

This was a prospective cross-sectional study being performed in department of cardiovascular and thoracic surgery of Sher-i-Kashmir institute of medical sciences located in northern India during a 3-year from January 2009 to December 2012. We included 36 patients who were referred to our center because of Pardah pin inhalation and underwent rigid bronchoscopy during the study period. All the patients provided their informed written consents before inclusion in the study. The study protocol was approved by the institutional review board and medical ethics research committee of our center.

### Study protocol

All the patients were visited in the surgical emergency room and underwent complete physical examination, along with taking detailed patient' history by the attending surgeon. Demographic information as well as the interval between inhalation and presentation was recorded. A posteroanterior chest radiography was taken for every patient followed by non-contrast computed tomography (CT) with 3-dimensional (3D) reconstruction. Chest radiography was taken immediately before bronchoscopy to ensure the exact location of the foreign body. The bronchoscopy was then performed using rigid ventilating bronchoscope (Type, Company, City, and Country). All the bronchoscopies were performed in emergency theatre under local anesthesia or general anesthesia with all facilities of resuscitation available by the same attending thoracic surgeon (Name of the surgeon). Patients were transferred to main ward after bronchoscopy. In case of failed bronchoscopy open thoracotomy with bronchotomy was performed. The patients were kept in hospital for 12 to 24 hours after bronchoscopy.

### Statistical analysis

The data and information was prospectively entered

into a computer database and was further analyzed. The statistical package for social science, SPSS for Windows, Version 15.0 (SPSS Inc., Chicago, IL, USA) was used for data analysis. Data was presented as mean  $\pm$  SD and proportions as appropriate. A *p*-values less than 0.05 was considered statistically significant.

## Results

All patients were female using scarf to wrap their head and neck as religious obligation. There was history of keeping the pin in between lips in every patient. Mean age of the patients was  $14.3 \pm 3.6$  years. The most common symptom was choking followed by cough being reported in all (100%) and 31 (86.1%) patients respectively. Lateral cervical radiography showed the presence of the Pardah pin (Figure 1). Computed tomography with 3D reconstruction was performed to find the exact location of the pin. Bronchoscopy was successful in removing the pin in 31 (86.1%) patients. Pins were located in right main bronchus in 20 (55.5%) patients, and in left main bronchus in 10 (27.7%) patients. In 2 (5.5%) patient pin was in the right lower lobe bronchus. In both these patients pin was in the segmental bronchus. The pin was swallowed by one (2.7%) patient after coughing it out. The pin travelled through the gastrointestinal (GI) tract and passed out with stool. There was no mortality in our series. All patients did well and are on follow-up. Pin was removed in 31 (86.1%) patients with the help of bronchoscope, but 5 (13.9%) patients needed bronchotomy for removal of the pin. Average hospital stay was  $12.43 \pm 1.6$  hours.

## Discussion

Accidental foreign body inhalation is a relatively common occurrence in pediatric patients [8,9], and may lead to asphyxiation and death, especially among those aged more than 4 years [10]. Physical examination findings include fever, stridor, retractions, and decreased breath sounds. Obstructive emphysema in the same or contra-lateral side is found in most cases. Radiographic imaging can be helpful if the aspirated object is radio-opaque or if there are signs of hyper-expansion on expiration. However negative-imaging studies, do not exclude the presence of a foreign body in the airway. The longer a foreign body resides in the airway, the more likely it is to migrate distally and cause an inflammatory reaction leading to granulation and impacting. When this occurs, symptoms of chronic cough and wheezing may mimic asthma like condition, [10]. Pardah pin aspirations exhibit different characteristics from other foreign body aspirations with a diverse distribution in age and sex. Whereas foreign body aspirations are generally reported in boys aged 6 months to 4 years, Pardah pin aspirations are observed exclusively in



Fig. 1. Lateral cervical radiography showing the presence of the Pardah pin in the trachea.

adolescent girls [11,12].

Aspirations of headed pins are increasing in the last few years together with the trend of using different kind of head scarf. This scarf is wrapped around head and neck with the help of pins which are kept between two lips when removing or wrapping the scarf. The pins are then aspirated on taking a deep breath. Several studies have emphasized an increase in similar headed pin aspirations and related morbidity [13]. Helical CT and virtual bronchoscopy can be considered in order to avoid needless rigid bronchoscopy [1]. Rigid bronchoscopy under general anesthesia is preferred method for removal of aspirated foreign body in pediatric patients. General anesthesia can be avoided in adults, but presence of anesthesiologist with proper work station to combat emergent situation is essential. Surgery should be performed only as a last resort and is rarely necessary. The foreign bodies may get slipped off at the level of the glottis in some cases leading to repeated attempts and catastrophic sequale such as respiratory distress syndrome, massive bleeding and choking. The configuration of the bronchial tree and the posture of the person during aspiration determine the location of the foreign body [14,15]. The smaller angle and a larger air volume during inspiration are responsible for foreign body locating in the right bronchus in general [16]. We found that Pardah pins were located in the right bronchus in most cases, a finding consistent with published studies [13-15]. Pardah pin aspiration has different

characteristics and deserves special attention during removal. X-ray should be done before bronchoscopy in the operating theatre to locate foreign body which is prone to change its location [17]. Main problems of bronchoscopy are larynx spasm and bronchial edema, in addition to difficulties in removing the pin caused by intra-bronchial localization barrier. All the procedures were performed using rigid ventilating bronchoscope. Some investigators have managed to remove foreign bodies from tracheobronchial tree with flexible bronchoscope, but suggested that rigid bronchoscope should be at hand, in the event of failing flexible bronchoscopy extraction. Dexamethasone as a stat dose followed by divided doses in the next 24 hours, decreases edema in the tracheobronchial tree [18]. Most foreign bodies trapped in the right main bronchus, because right main bronchus is more vertical and wider than the left main bronchus [6,9]. Our success rate is (97.6%) with no mortality which was in agreement with other studies [6]. Complications of bronchoscopy for foreign body aspiration may occur even in experience hands [18]. One of our patients was considered to have acute asthmatic attack, but on bronchoscopy foreign body (maize) was recovered. Possible aspiration of foreign body particularly with unilateral wheezing was considered in children undergoing treatment for new onset asthma, who did not respond to treatment for bronchitis or pneumonia [10].

In conclusion, early diagnosis and intervention is essential in children with foreign bodies in the

airway to prevent mortality and morbidity. Small objects, especially food particles should be kept away from toddlers, and parents should be educated about the risk involved in inhaling foreign bodies. Whistles (toys) which are easily accessible should be withdrawn from the market, made compulsory by legislation. Bronchoscope should be made available at least at every district hospital to save precious lives by making an early intervention possible, as most of these patients expire on the way to the tertiary care hospitals. Additionally, the turban which is an

important socio-cultural and political feature is also responsible for an increasing morbidity and mortality due to pin aspirations. Unveiling in children, using adhesive tapes, press stud and clips to fix the turban and to forbid holding the pins in the mouth as well as raising public awareness about the associated risks, are other preventive measures taken to prevent Pardah pin aspirations.

**Conflict of Interest:** None declared.

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