Headscarf pin tracheobronchial aspiration: a distinct clinical entity

Nael Al-Sarraf*, Hassan Jamal-Eddine, Fatma Khaja, Adel K. Ayed

Department of Thoracic Surgery, Chest Disease Hospital, Kuwait

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Abstract

Foreign body (FB) aspiration is commonly seen in children and less commonly in the elderly. However, due to some social and cultural factors, a distinct group of tracheobronchial FB aspiration is increasingly recognized. We sought to assess our experience with such entity. A retrospective review of all cases with veil pin tracheobronchial FB aspiration in a single center over a 13-year period was carried out. There were 35 cases of headscarf tracheobronchial FB aspiration. All were females with mean age of 14 years. All patients experienced coughing and all had positive chest radiography findings. Commonest anatomical location was right main bronchus (32%) followed by left main bronchus (23%). Tracheal pins occurred in 17%. Rigid bronchoscopy was used more often than flexible bronchoscopy (83% vs. 17%, respectively). Repeat bronchoscopy was required in two cases (6%). Thoracotomy was required in one patient (3%). There were no complications or hospital deaths. Headscarf pin aspiration is seen in middle-aged women who inappropriately place the pins between their lips prior to securing their veils. Bronchoscopy is the treatment modality of choice and surgery is rarely required. Preventative educational strategies should be implemented to reduce such an avoidable risk.

Keywords: Bronchoscopy; Foreign body; Tracheobronchial aspiration

1. Introduction

Foreign body (FB) aspiration remains a common but largely preventable problem. It is commonly encountered in children at a young age [1] and in the elderly due to an underlying medical condition [2]. However, there is a distinct group of patients who are recently being recognized and are at risk. These patients include women wearing headscarves and inappropriately placing the safety pin in their mouth prior to securing the veils leading to an accidental FB aspiration [3–8]. In contrast to other forms of FB aspiration, this group often presents early and the diagnosis is made solely on radiography due to the radiopaque nature of the safety pins. The use of bronchoscopy has dramatically reduced the need for thoracotomies. In this paper, we analyze our experience over 13 years with such entity, together with our short-term outcome.

2. Materials and methods

All patients with sharp object FB aspiration treated in the Department of Thoracic Surgery at chest disease hospital between the period of January 1996 and December 2008 were retrospectively reviewed. There were a total of 48 patients with sharp object aspiration, of which 35 cases were due to headscarf pin aspiration. All of them were females. All patients had detailed history and physical examination followed-up with chest radiography prior to undergoing bronchoscopy. FB was removed by either rigid bronchoscopy (Karl Storz, Tuttingen, Germany) or flexible bronchoscopy (Lucera, Olympus, Japan). Rigid bronchoscopy was performed under general anesthesia while flexible bronchoscopy was performed under intravenous sedation and local anesthesia. In all cases, 1 mg of atropine was administered intramuscularly 30 min prior to the procedure and patients were sedated with 2–5 mg of intravenous midazolam (0.05 mg/kg). In flexible bronchoscopy, local anesthesia was administered to the patients before and during the procedure via the instillation of 2% lidocaine solution. Lidocaine was administered via a nebulizer or directly through the bronchoscope in a ‘spray as you go fashion’. The trans-oral route was used for both flexible and rigid bronchoscopy. The type of instruments used include: grasping forceps, alligator type forceps, and basket. The patient is normally positioned in a supine position in 25° Trendelenburg position. Appropriate airway control was maintained through the bronchoscope as we have previously reported [9]. All cases (with the exception of one patient who had surgery) were treated as day cases. All data are presented as percentages. Continuous variables are presented as mean with standard deviation (S.D.). This study was approved by our Institutional Review Board.

3. Results

There were a total of 35 patients, all were females. Ages ranged from 8 to 35 years with a mean (±S.D.) of 14 (±5) years.
years. A summary of the anatomical distribution, type of extraction method and short-term outcome is depicted in Table 1. All patients initially experienced coughing and all had normal physical examination as they were all non-asphyxiating and non-obstructive FB aspiration. Hemoptysis was only observed in four cases (11%). Incidence of headscarf tracheobronchial aspiration over the study period is illustrated in Fig. 1. There were no complications and no hospital mortality. Two cases required re-bronchoscopy due to failed primary attempt, one of which required surgery in the form of right thoracotomy and bronchotomy for a pin impacted in the right lower lobe. The second re-bronchoscopy patient had an initial flexible bronchoscopy which failed to extract the FB and required a rigid bronchoscopy to be performed (in the same setting following general anesthesia administration).

4. Discussion

FB aspiration remains a common problem among young children and is commonly divided into organic and inorganic FB aspiration. Organic materials such as nuts and seeds are the most commonly aspirated while the inorganic materials include a wide range of objects such as plastic pieces, toy parts, etc. [8]. Up to 85% of all FB aspiration occurs in children. In adults, most of FB aspirations are seen in the 6th or 7th decade of life when airway protective mechanisms function inadequately e.g. due to central nervous system dysfunction, intubation or facial traumas [10]. The younger age group is more vulnerable because of the lack of adequate dentition and immature swallowing coordination. In addition, among children of this age, introducing objects into their mouths is their way of exploring the world [2, 11]. However, in recent years (Fig. 1) some traditional or social habits have become a discrete category of FB aspiration. This is seen in women wearing headscarves in Islamic countries because of socio-cultural and religious tradition. Some women tend to hold the headscarf pin between their lips while wearing headscarves using their two hands to secure the veil. Any maneuver, such as laughter, talking and coughing then predispose them to aspiration, especially in the young teenage groups where they lack experience with such maneuver [3–8]. In contrast to other forms of FB aspiration, headscarf pin aspirations tend to be easily diagnosed as all of these inhaled FBs are radio-opaque [3] and, as such, can be picked up easily by chest radiography. Furthermore, in contrast to other forms of FB aspiration, chronic forms are rarely encountered because patients tend to seek medical advice quicker than in organic FB aspiration. Therefore, diagnostic bronchoscopy is rarely needed but rather a therapeutic intervention is required.

Once diagnosed by means of radiography, these inhaled pins should be removed bronchoscopically either by rigid bronchoscopy or flexible bronchoscopy. Fluoroscopy has been used successfully as an adjunct in cases of more distally located pins [7]. During rigid bronchoscopy, the pointed end of the pin should be grasped and taken into the bronchoscope. The pointed end can harm the bronchial mucosa or bronchial wall if the pin is grasped and pulled from the other part of the pin. The need for thoracotomy and bronchotomy is required in only a small number of cases and is mainly related to failed attempts of bronchoscopic extraction and a distal location of inhaled FB. Factors that influence the success of bronchoscopic management include: anatomical location, the experience of

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number (%)</th>
</tr>
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<tbody>
<tr>
<td>Side</td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>12 (34)</td>
</tr>
<tr>
<td>Right</td>
<td>17 (49)</td>
</tr>
<tr>
<td>Central</td>
<td>6 (17)</td>
</tr>
<tr>
<td>Anatomical location</td>
<td></td>
</tr>
<tr>
<td>Left main bronchus</td>
<td>8 (23)</td>
</tr>
<tr>
<td>Left lower lobe</td>
<td>4 (11)</td>
</tr>
<tr>
<td>Right main bronchus</td>
<td>11 (32)</td>
</tr>
<tr>
<td>Right lower lobe</td>
<td>6 (17)</td>
</tr>
<tr>
<td>Trachea</td>
<td>6 (17)</td>
</tr>
<tr>
<td>Type of foreign body</td>
<td></td>
</tr>
<tr>
<td>Pins</td>
<td>25 (71)</td>
</tr>
<tr>
<td>Safety pins</td>
<td>7 (20)</td>
</tr>
<tr>
<td>Metallic clips</td>
<td>3 (9)</td>
</tr>
<tr>
<td>Extraction method</td>
<td></td>
</tr>
<tr>
<td>Rigid bronchoscopy</td>
<td>29 (83)</td>
</tr>
<tr>
<td>Flexible bronchoscopy</td>
<td>6 (17)</td>
</tr>
<tr>
<td>Repeat bronchoscopy</td>
<td>2 (6)</td>
</tr>
<tr>
<td>Surgery required</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1 (3)</td>
</tr>
<tr>
<td>No</td>
<td>34 (97)</td>
</tr>
<tr>
<td>Status at discharge</td>
<td></td>
</tr>
<tr>
<td>Alive</td>
<td>35 (100)</td>
</tr>
<tr>
<td>Dead</td>
<td>0</td>
</tr>
</tbody>
</table>

S.D., standard deviation.
clinician performing the procedure and the early intervention [3]. In our experience, we have used rigid bronchoscopy (29 cases, 83%) far more commonly than flexible bronchoscopy (6 cases, 17%), although in recent years, as our experience has improved with dealing with this entity, flexible bronchoscopy has been used more often. A rigid bronchoscopy provides a greater access to the subglottic airways ensuring correct oxygenation and easy passage of

Table 2
Summary of the advantages and disadvantages of rigid and flexible bronchoscopies in the setting of foreign body aspiration

<table>
<thead>
<tr>
<th>Type of bronchoscopy</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Rigid bronchoscopy   | 1. Ideal for children and young patients  
2. Better airway control and more effective ventilation  
3. Efficient suctioning and control in case of major airway bleed  
4. Requires less experience than flexible bronchoscopy in FB removal |
| Flexible bronchoscopy| 1. Local anesthesia  
2. Easy to use and safe  
3. Useful in extracting distal FB  
4. Useful in certain cases (e.g. mechanically ventilated patients or those with spine or skull fractures)  
5. Useful in elderly patients                                                             | 1. Difficult in young patients and children  
2. Limited airway control  
3. Difficult suctioning in massive airway bleed  
4. Requires more experience than rigid bronchoscopy in FB removal  
5. Success rates are lower in FB removal than rigid bronchoscopy |

FB, foreign body.

Table 3
Summary of published studies dealing with sharp object foreign body aspiration (including the series of headscarf pin aspiration)

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Gender and number of patients (n)</th>
<th>Age range (mean years)</th>
<th>Extraction method</th>
<th>Locations</th>
<th>Main findings</th>
</tr>
</thead>
</table>
| Kaplanoglu et al. (1999) [3] | Females only (n=63) | 7–21 (14.4) | Rigid (n=57)  
Flexible (n=2)  
Laryngoscopy (n=3)  
Thoracotomy (n=1) | Trachea (n=22)  
Right lung (n=21)  
Left lung (n=17) | 1. No mortality  
2. Repeat bronchoscopy in 8% (n=5) |
| Murthy et al. (2001) [4] | Females only (n=6) | 5–6 (N/A*) | Rigid bronchoscopy in all cases | Trachea (2)  
Right lung (n=2)  
Left lung (n=2) | 1. No mortality  
2. No complication  
3. No repeat bronchoscopy |
Males (n=2) | 6–40 (14) | Rigid (n=114)  
Flexible (n=0)  
Thoracotomy (n=8) | Trachea (n=7)  
Right lung (n=54)  
Left lung (n=63) | 1. No mortality  
2. Complication rate 35% (n=44)  
3. Repeat bronchoscopy 24% (n=30)  
4. 2nd repeat bronchoscopy 11% (n=14) |
| Hasdiraz et al. (2006) [6] | Females only (n=105) | 13–35 (18.7) | Rigid (n=93)  
Flexible (n=4)  
Laryngoscopy (n=6)  
Thoracotomy (n=1)  
Spontaneous expectoration (n=1) | Larynx (n=6)  
Trachea (n=21)  
Right lung (n=52)  
Left lung (n=26) | 1. No mortality  
2. Repeat bronchoscopy 11% (n=12) |
| Yüksel et al. (2006) [7] | Females (n=49)  
Males (n=7) | N/A* | Rigid bronchoscopy in all cases | Trachea (n=12)  
Right lung (n=20)  
Left lung (n=24) | 1. No mortality  
2. Repeat bronchoscopy 4% (n=2)  
3. Complication rate 11% (n=6) |
| Gencer et al. (2007) [8] | Females only (n=23) | 12–23 (17.5) | Flexible (n=21)  
Other** (n=2) | Trachea (n=3)  
Right lung (n=11)  
Left lung (n=9) | 1. No mortality  
2. No repeat bronchoscopy |

*Not available in the relative study.  
**These two cases were initially extracted by flexible bronchoscopy but then were dropped and due to postural drainage and coughing, the patients swallowed these two pins which were later excreted uneventfully in the stool.
the telescope and grasping forceps during FB extraction. In addition, rigid bronchoscopy allows a very efficient airway suctioning in case of massive bleed and is not time consuming. That is why it is preferred in children [11, 12]. In adults, flexible bronchoscopy has many advantages including its ease, safety profile and its superiority in cases of distally located FBs [8, 11, 13] (Fig. 2a). A summary of main advantages and disadvantages of both types of bronchoscopy is depicted in Table 2.

Our results seem consistent with previously published reports on pin aspiration; a summary of these reports is depicted in Table 3. One important finding is the general preference of rigid over flexible bronchoscopy in these series. In addition, the condition is preponderant in females of early teenage years due to their lack of experience when securing the headscarves. Furthermore, the use of surgical intervention in the form of bronchotomy or lobectomy has been generally limited due to the success of interventional procedures in extracting the pins. All of these sharp pins are radio-opaque and as such, the diagnosis is generally quicker than in cases of organic FB aspiration and chronic cases are rarely encountered [14]. One additional note is the general variation in the anatomical location of aspirated pin (Table 3). Reasons for this include size of main bronchus and angle formation [12, 15].

The main limitations of our study are two. The first limitation is the retrospective nature of the analysis and, as such, only an association can be reported. The second limitation is the small volume of patients in our study. However, within these acceptable limitations, we believe our work will shed more light into the subject of headscarf tracheobronchial pin aspiration.

5. Conclusion

Pin aspiration is a distinct clinical entity that is encountered in countries where headscarves are used because of social, traditional or religious purposes. The lack of experience of these young women on occasions can predispose them to FB aspiration. Rigid bronchoscopy is the treatment modality of choice with flexible bronchoscopy being increasingly used, especially in distally located pins. Thoracotomy is rarely required. Public awareness is required to prevent such aspiration and adequate education of women wearing headscarves is required to avoid the habit of placing the pins in their mouth prior to securing their headscarves.

References