Retrospective analysis of 103 foreign body aspiration cases among four University Medical Centers in the Rhône-Alpes Auvergne region (2010)

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Case # 1

- 1 ½ years old male with **FBA syndrome (as per mother’s history)**, 3 hospitalisations; 1\(^{st}\) time: the discharge diagnosis was **bronchiolitis**; 2\(^{nd}\) time, 2 wks later it was persistent **pneumonia**; 3\(^{rd}\) time: initially diagnosed as **acute severe asthma attack**. Upon questioning the father: the infant woke up from nap **apparently in severe pain**, inconsolable, hypoxia more severe than the degree of respiratory distress. Transferred urgently.

- **FBA**: piece of colored crayon, damage to **R&L bronchi**.
Case # 2

• 3 years old male with known asthma coming in for acute asthma attack, with wheezing disproportionately more pronounced than the degree of respiratory distress. Chest CT: mucus plug. Upon requestioning the mother post-CT, “the cough was different for the past 2 months, and more frequent”. She then remembered an episode of choking on peanuts 2 months ago for which she had performed a Heimlick maneuver, without expulsion of the peanut, but improvement of the child. Transferred to UMC.

• FBA: peanut piece with damage to R&L bronchi.
Distribution of the 103 included cases of foreign body (FB) aspiration among the 4 University Medical Centers

<table>
<thead>
<tr>
<th></th>
<th>S+</th>
<th>S-</th>
<th>L</th>
<th>Chr</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grenoble</td>
<td>11</td>
<td>9</td>
<td>4</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Saint Etienne</td>
<td>11</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Clermont</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Lyon</td>
<td>20</td>
<td>14</td>
<td>2</td>
<td>5</td>
<td>41</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>31</td>
<td>8</td>
<td>15</td>
<td>103</td>
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</table>

S+=solid, recent FB aspiration, FB recovered from the respiratory tract
S-=solid, recent FB aspiration, FB identified but not recovered from the respiratory tract
L=liquid or soft, recent FB aspiration
Chr=unidentified FB, chronic respiratory tract pathology
Age: <1 year old 13%, 1-2 years old 33%, 2-3 years old 24%, 3-18 years old 30%.
(between 1 and 2.5 years old 64%).

Gender ratio (M/F): 1.5/1.
Organic: 66%
- meat, fishbone: 29%
- fruit/vegetable: 13%
- oleaginous: 58% (30% peanuts)

Non-organic: 34%
- pen cap, "lego", hair fashion pin, vascular catheter fragments, crayon piece, candy
Age distribution: organic vs non organic FB

<table>
<thead>
<tr>
<th></th>
<th>Nbr cases</th>
<th>FB+</th>
<th>Non organic</th>
<th>Non org/FB+</th>
<th>Non org/Total</th>
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</thead>
<tbody>
<tr>
<td>≤1an</td>
<td>18</td>
<td>6</td>
<td>3</td>
<td>50%</td>
<td>17%</td>
</tr>
<tr>
<td>&lt;3ans</td>
<td>70</td>
<td>35</td>
<td>5</td>
<td>14%</td>
<td>7%</td>
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<tr>
<td>&gt;3ans</td>
<td>33</td>
<td>14</td>
<td>6</td>
<td>43%</td>
<td>18%</td>
</tr>
<tr>
<td>Tot cases</td>
<td>103</td>
<td>49</td>
<td>11</td>
<td>22%</td>
<td>11%</td>
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</tbody>
</table>
Distribution of FBA syndromes, pathological chest X-Rays and chest CT scans among the 4 University Medical Centers

<table>
<thead>
<tr>
<th></th>
<th>Grenoble</th>
<th>Saint Etienne</th>
<th>Clermont Ferrand</th>
<th>Lyon</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>FB aspiration syndrome</td>
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<td></td>
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<tr>
<td>(+ or -)</td>
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</tr>
<tr>
<td>S+</td>
<td>10/1</td>
<td>10/1</td>
<td>6/1</td>
<td>18/2</td>
<td>44/5 (90%+)</td>
</tr>
<tr>
<td>S-</td>
<td>9/0</td>
<td>2/1</td>
<td>5/0</td>
<td>12/2</td>
<td>28/3 (90%+)</td>
</tr>
<tr>
<td>L</td>
<td>4/0</td>
<td>1/0</td>
<td>0/1</td>
<td>2/0</td>
<td>7/1 (87%+)</td>
</tr>
<tr>
<td>Chr</td>
<td>4/2</td>
<td>1/2</td>
<td>0/1</td>
<td>2/3</td>
<td>7/8 (47%+)</td>
</tr>
<tr>
<td>Pathological chest X-Rays (%)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>36%</td>
<td>61%</td>
<td>85%</td>
<td>74%</td>
<td>65%</td>
</tr>
<tr>
<td>Chest CT scan</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1*</td>
<td>4**</td>
<td></td>
<td>18</td>
</tr>
</tbody>
</table>

*at community hospital
**of which one at community hospital
Anatomical location: 12% supraglottic, 85% subglottic (of which 8% laryngeal, 2% tracheal, 90% bronchial).

Procedures: 75% underwent a bronchoscopy (53% rigid only, 19% flexible only and 28% both procedures). Thus 81% underwent a rigid bronchoscopy. 12% underwent a nasal fibroscopy/laryngoscopy.

Flexible/Total: Grenoble 20%, Saint-Etienne 60%, Clermont-Ferrand 47%, Lyon 26%
Transfer from a community hospital: 20%.

Hospital stay: 1-2 days (87.5%), 3-9 days (12.5%).

Time from diagnosis to endoscopy: 0-1 day (88%), 2->30 days (12%), mean: 11.9 days.

Treatment: antibiotics (42%), corticosteroids (34%), chest physical therapy (7%).

Organisms recovered: Rhinovirus (2), Streptococcus pneumoniae (2), Haemophilus influenzae (1), Respiratory syncytial Virus (1), Moxarella catarrhalis (1), Pseudomonas aeroginosa (1).
Complications: no severe acute complications in connection to the FBA (acute asphyxia, irreversible). Complications during bronchoscopy in 4 cases. Long term complications in 9 cases, 6 weeks to 2 years post-aspiration: persisting dysphonia with scarring (pistachio shell), recurrent pneumopathies (long term antibiotics and corticosteroids), pulmonary abscess, asthma with or without laryngitis, granulomas discovered upon endoscopy.

Of the 4 University Medical Centers, 2 had a protocol for FBA (Grenoble and Saint-Etienne)
10 cases of fishbone FBA (19% of organic FB), 80% of which at the University Medical Center in Lyon.

Heimlich (H) and/or Mofenson (M) maneuvers reported in 18 cases (10H et 8M) by a family member or a neighbor. Both maneuvers in 2 cases. 22% successful: candy (2 cases, H), one piece of meat (H), one piece of apple (M).

In 3 cases: extraction trial with finger in the mouth.
Conclusion

• Differences between centers for:
  - use of flexible bronchoscopy
  - use of chest CT
  - rate of pathological chest Xrays
  - incidence of fishbone aspiration

• Importance of recurrent questioning for FBA recall
Discussion

• Already described in the literature
  1. Male predominance
  2. Variable use of flexible bronchoscopy
  3. Variable use of CT scan

• New findings (to the best of our knowledge)
  1. Comparison between centers in the same region
  2. Study of “Liquid FB”
  3. Reporting on Heimlich/Mofenson maneuvers recall
  4. Separate evaluation of <1yo, with an unexpectedly high rate of non-organic FBA
Thank you for your attention

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