

## Spontaneous Assisted Ventilation in the Extraction of a Seed in the Left Main Bronchus

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**We report a six-year-old Egyptian male who had aspirated a sunflower seed in his airway. The seed was removed using a fibreoptic camera and long forceps while he was ventilated using the SAV method.**

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Foreign body aspiration in the tracheobronchial system is a pediatric emergency; if not removed on time, it could result in pulmonary complications such as pneumonia, atelectasis and could lead to an airway obstruction, which could be fatal<sup>1-4</sup>. The standard gold treatment is the removal of a foreign body using a rigid bronchoscopy performed under general anaesthesia<sup>4,5</sup>. Because of the bronchoscope occupying the airway, different methods of ventilation have been considered, such as the apneic oxygenation method, controlled ventilation (closed system), manual jet ventilation and the spontaneous assisted ventilation (SAV)<sup>6</sup>.

Spontaneous assisted ventilation is a type of anesthesia in which the patients level of consciousness is closely monitored, and the patient maintains ventilation through his own spontaneous breaths. The induction agent is administered intravenously and maintained with volatile anesthetic delivered via a supraglottic tube; if needed, ventilation could be assisted by the anesthetist via bag mask connected to high flow oxygen<sup>6</sup>.

In the Kingdom of Bahrain, few centers practice the SAV method; therefore, bronchoscopy for the removal of a foreign body is performed with difficulty by the ENT surgeon.

The aim of this presentation is to report a six-year-old child who had aspirated a sunflower seed, which has been removed using a fibreoptic camera and SAV method.

### THE CASE

A six-year-old Egyptian male presented with 2-days history of aspiration of a foreign body, see figure 1. The patient aspirated and choked on a sunflower seed and woke up the next day with difficulty in breathing, cough and chest pain.

The patient's past medical history revealed controlled asthma, tonsillectomy and adenoidectomy in 2015. Before presenting to our institution, the patient was treated with Ventolin in another public institution.

On examination, he was alert, conscious and oriented, afebrile, not cyanotic, congested nasal mucosa and conductive chest sounds with reduced air entry on the left side. A chest X-ray was performed and showed no abnormalities; WBC differential showed 85% neutrophil.

Fibro bronchoscopy was performed under spontaneous assisted ventilation, enabling full access to the trachea without an obstruction endotracheal tube. The sunflower seed was located in the left main bronchus and removed with a long forceps under direct vision of a fiber-optic camera, see figures 2 and 3.



Figure 1: Sunflower Seed

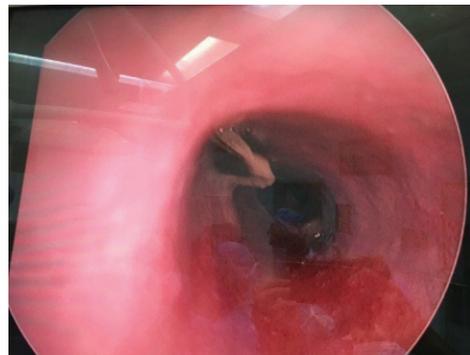
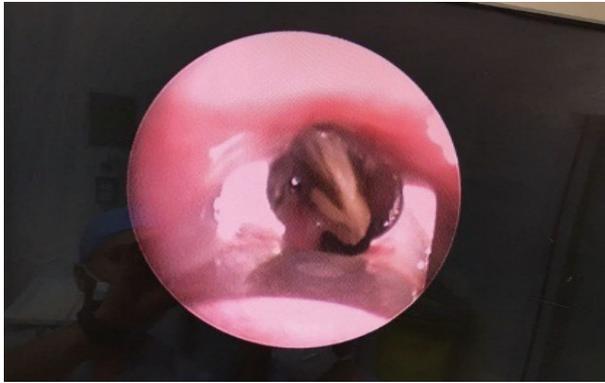


Figure 2: Bronchoscopic View

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**Figure 3: Bronchoscopic Removal**

The patient was kept overnight for observation and discharged the following day with no subsequent complications.

### DISCUSSION

Current evidence reveals no difference in which type of ventilation method is superior in rigid bronchoscopy; however, some authors have argued that SAV could provide a better ventilation-perfusion ratio, better alveolar ventilation and reduce the risk of ventilator-associated perfusion injury<sup>7</sup>. In our case, the ventilation was maintained spontaneously throughout the procedure with no episodes of desaturation.

SAV is usually associated with lower risk of complete airway collapse because muscle relaxant is not used. Another advantage is the maintenance of ventilation despite interruptions in the anesthesia circuit as the patient is spontaneously breathing<sup>9</sup>.

A serious concern of positive pressure ventilation is the possibility of the foreign body being pushed farther into the tracheobronchial tree, such event could further complicate the case and could warrant cardiothoracic intervention. Such complications are avoided by the SAV method<sup>4</sup>.

The disadvantage of SAV is the difficulty of maintaining an adequate level of sedation while maintaining ventilation<sup>10</sup>. On the other hand, closed ventilation method involves the use of muscle relaxants, which facilitate the control of the level of sedation<sup>11</sup>.

In our case, SAV was the preferred technique, where the foreign body was thought to be difficult to remove; it allowed for a better view of the tracheobronchial system, easier control of the instruments and manipulation of the foreign body<sup>12</sup>.

Notable complications described by other authors include severe perioperative or postoperative hypoxemia, bronchospasm, and laryngospasm. Our patient had no complication, had an uneventful recovery and was discharged the following day<sup>13</sup>.

### CONCLUSION

**A six-year-old child aspirated a sunflower seed. The seed was removed using a fiberoptic camera and long forceps while he was ventilated using the SAV method.**

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### REFERENCES

1. Eren S, Balci AE, Dikici B, et al. Foreign Body Aspiration in Children: Experience of 1160 Cases. *Ann Trop Paediatr* 2003; 23(1):31-7.
2. Zhijun C, Fugao Z, Niankai Z, et al. Therapeutic Experience from 1428 Patients with Pediatric Tracheobronchial Foreign Body. *J Pediatr Surg* 2008; 43(4):718-21.
3. Inglis AF Jr, Wagner DV. Lower Complication Rates Associated with Bronchial Foreign Bodies Over the Last 20 Years. *Ann Otol Rhinol Laryngol* 1992; 101(1):61-6.
4. Farrel PT. Rigid Bronchoscopy for Foreign Body Removal: Anaesthesia and Ventilation. *Paediatr Anaesth* 2004; 14(1):84-9.
5. Oncel M, Sunam GS, Ceran S. Tracheobronchial Aspiration of Foreign Bodies and Rigid Bronchoscopy in Children. *Pediatr Int* 2012; 54(4):532-5.
6. Pathak V, Welsby I, Mahmood K, et al. Ventilation and Anesthetic Approaches for Rigid Bronchoscopy. *Ann Am Thorac Soc* 2014; 11(4):628-34.
7. Liu Y, Chen L, Li S. Controlled Ventilation or Spontaneous Respiration in Anesthesia for Tracheobronchial Foreign Body Removal: A Meta-Analysis. *Paediatr Anaesth* 2014; 24(10):1023-30.
8. Chai J, Wu XY, Han N, et al. A Retrospective Study of Anesthesia During Rigid Bronchoscopy for Airway Foreign Body Removal in Children: Propofol and Sevoflurane with Spontaneous Ventilation. *Paediatr Anaesth* 2014; 24(10):1031-6.
9. Litman RS. Anaesthesia for Bronchial Foreign Body Removal: What Really Matters? *Eur J Anaesthesiol* 2010; 27(11):928-9.
10. Soodan A, Pawar D, Subramaniam R. Anesthesia for Removal of Inhaled Foreign Bodies in Children. *Paediatr Anaesth* 2004; 14(11):947-52.
11. Fidkowski CW, Zheng H, Firth PG. The Anesthetic Considerations of Tracheobronchial Foreign Bodies in Children: A Literature Review of 12,979 Cases. *Anesth Analg* 2010; 111(4):1016-25.
12. Wen WP, Su ZZ, Wang ZF, et al. Anesthesia for Tracheobronchial Foreign Bodies Removal Via Self-Retaining Laryngoscopy and Hopkins Telescopy in Children. *Eur Arch Otorhinolaryngol* 2012; 269(3):911-6.
13. Perrin G, Colt HG, Martin C, et al. Safety of Interventional Rigid Bronchoscopy Using Intravenous Anesthesia and Spontaneous Assisted Ventilation. A Prospective Study. *Chest* 1992; 102(5):1526-30.