

## Aspiration of Rear End of Pen in Children – Management Issues

Rear pen-ends are unusual foreign bodies in the airway, occurring mostly in school-age children. A total of seven children (age 3-9 y), all boys, were admitted in our hospital with history of aspiration of detachable pen end from January 2012 to December 2015. The duration from the aspiration to presentation was from 10 days to as late as 2 months. Only one child presented acutely as the pen-end had lodged in the subglottis. The most common presenting complaint was cough (7/7), followed by noisy breathing in the form of audible wheeze (3/7), and fever and breathing difficulty (1/7 each). Most of them (6/7) had received repeated nebulizations prior to their presentation. Air-entry was equal in five children; 2 children had reduced air-entry on the side of the aspiration. A monophonic wheeze was the only added sound heard (5/7); one child had stridor. Chest X-ray was normal (3/7) or showed unilateral hyper-inflation (3/7) or pneumonic consolidation (1/7). During flexible bronchoscopy, the pen-ends were seen on left side in three, right side in three, and subglottis in one child. The sites of lodgement were in the main bronchus (3/7), segmental bronchus (2/7), subsegmental bronchus (1/7) and subglottis (1/7). Successful removal by rigid bronchoscopy was possible in four children. The rest underwent segmental lobectomies after multiple failed attempts at rigid bronchoscopic removals. All seven children recovered uneventfully after removal with no post-removal or post-surgical complications. All the pen caps that were ultimately retrieved, either by rigid bronchoscopy or by surgery, had a perforation at the rear end (**Fig.1**). This hole, which had allowed sufficient air entry when lodged in the bronchus, explains the absence of breathing difficulty or respiratory distress as a presenting feature [1].

Tapering rear end of most of the pen-ends causes them to be lodged in the segmental or subsegmental bronchial segments. The mouth of the pen cap is always upwards and moves through the glottis into the airway, and easily forms an inlay with the bronchus, making removal a big challenge [2,3]. In all the three cases which required lobectomies, the pen-ends were lodged in the segmental and subsegmental bronchi, covered by granulation tissue and were simply not visible with the rigid bronchoscope.

Aspiration of a perforated pen-end neither presents



**FIG. 1** Flexible bronchoscopic view showing rear end of pen in a segmental bronchus with overlying granulation tissue and central hole.

with the classic clinical features like respiratory distress and decreased breath sounds nor the typical secondary radiographic changes. Therefore, high clinical suspicion and use of flexible bronchoscopy as the initial technique of evaluation in patients with suspected foreign body aspiration are needed. Given the high probability of aspiration, pens without detachable rear ends should be encouraged for use in children.

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