International Journal of Pediatric Otorhinolaryngology (2008) 72, 1771–1776

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International Journal of Pediatric Otorhinolaryngology

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Flexible bronchoscopy and interdisciplinary collaboration in pediatric large airway disease☆

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Received 13 May 2008; received in revised form 5 August 2008; accepted 9 August 2008
Available online 25 September 2008

KEYWORDS
Flexible bronchoscopy;
Rigid bronchoscopy;
Pediatric;
Multidisciplinary

Summary

Objective: Demonstrate the benefits of a multidisciplinary pediatric airway team prepared to evaluate and treat otolaryngology patients with flexible bronchoscopy.
Design: Case series.
Setting: Tertiary, academic children's hospital.
Patients: 10 children (5 male, 5 female age range 2 months–16 years) presenting with complex symptoms potentially referable to large airways.
Intervention: Flexible bronchoscopy for diagnostic (bronchoalveolar lavage, ciliary biopsy, assess ongoing surgical intervention, and rule in or rule out foreign body; $N = 6$) or therapeutic (evacuate bronchial mucus plug, laser subglottis when patient has fused cervical spine, and distal instillation [fibrin glue for bronchopleural fistula and dornase alpha for plastic bronchitis]; $N = 4$).
Main outcome measure: Retrospectively ask if flexible bronchoscopy and interdisciplinary management improved patient care in these select otolaryngology cases.
Results: 10/10 patients benefited from interdisciplinary management including flexible bronchoscopy.
Conclusion: Our experience illustrates many uses for flexible bronchoscopy in otolaryngology patients, and suggests that an airway team prepared to use flexible bronchoscopy will create opportunities for improved patient care.

1. Introduction

Historically, large airway disease in children has been primarily managed by pediatric otolaryngologists with the use of a rigid bronchoscope. The

☆ Presented at the 23rd Annual Meeting of the American Society of Pediatric Otolaryngology (ASPO), Combined Sections Meeting, 2–4 May, 2008, Orlando, FL, USA.

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0165-5876/$ – see front matter
doi:10.1016/j.ijporl.2008.08.011

advent of thinner, more versatile flexible bronchoscopes has expanded their application in the pediatric airway. In most cases, there are distinct advantages of a rigid versus flexible bronchoscopy and vice versa. Rigid bronchoscopy is ideal for debulking large tumors in the major airways, dilation of strictures, laser bronchoscopy, insertion of stents, and extraction of foreign bodies [1]. The rigid fiberoptics provide better lighting and the highest quality images. One may ventilate through the rigid bronchoscope, thus it can be used to bypass a distal obstruction to secure an airway.

Flexible bronchoscopy is used in greater than 95% of all bronchoscopies [2]. The indications for flexible bronchoscopy in pediatric patients are predominately diagnostic and include evaluation for airway obstruction (stridor and wheezing), radiographic abnormalities (atelectasis, infiltrates, consolidation and hyperinflation), chronic cough (suspected foreign body, hemoptysis and evaluate artificial airway) or infection (bronchoalveolar lavage and endobronchial/transbronchial biopsy). In addition, flexible bronchoscopy can be utilized for simple therapeutic procedures including removal of mucus plugs or blood clots, drug administration and endoscopic intubation. More recently, the flexible bronchoscope has been utilized in more specialized procedures for lesions that are less accessible with rigid equipment, including closure of distal bronchopleural fistulae. Flexible bronchoscopy can be performed under a lighter plane of anesthesia, allowing for increased safety in many situations. It can be passed through a laryngeal mask airway or an endotracheal tube, permitting simultaneous ventilation in the absence of distal airway obstruction. Its flexibility allows its use in many situations where rigid intubation would be impractical or impossible (Fig. 1).

Not infrequently, to the patient's detriment, pediatric subspecialists battle for domain of the flexible and/or rigid scopes, as well as for proximal and/or distal airway lesions. Described in this article are 10 pediatric patients who benefited from multidisciplinary management. Collegial collaboration between pediatric otolarynologists and pulmonologists allows each specialist to utilize his or her skill set for the betterment of patient care.

2. Methods and materials

Institution Review Board approval was obtained to retrospectively examine cases managed by our multidisciplinary airway team. 10 cases were identified since October 2003 in which our pediatric otolaryngology and pediatric pulmonary consultants managed a patient in concert while using flexible bronchoscopy. Each case was reviewed to determine if the collaborative approach and flexible bronchoscopy aided patient care.

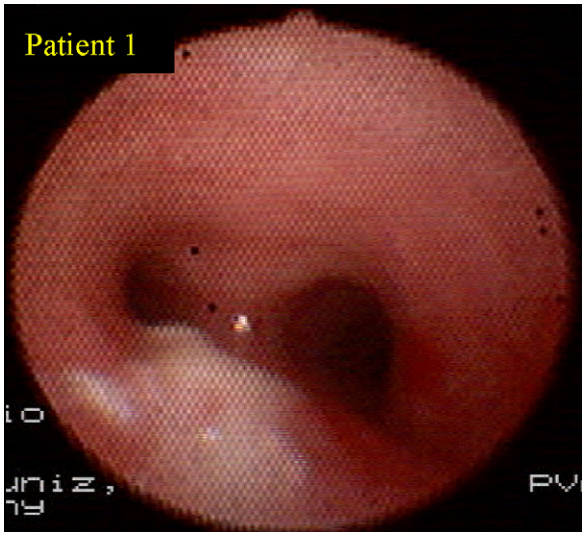

Fig. 1 Mucus plug visible at the carina in this endoscopic view extends into the right lung causing right lower lobe atelectasis.

3. Discussion

All 10 patients benefited in the form of improved diagnosis and treatment. Table 1 depicts the various patients and the advantages of flexible bronchoscopy in each case. The benefits of flexible bronchoscopy over rigid include the avoidance of general anesthesia (Patients 1 and 8), ability to perform examination at the bedside (Patient 1), through existing endotracheal tube (Patient 3), and in varying patient head positions (Patient 3), the increased cost-effectiveness, and the avoidance of complications associated with rigid bronchoscopy (subglottic edema and bronchospasm) [3]. Comments follow regarding the different indications.

3.1. Foreign body (Patients 2 and 8)

Swanson et al. argued that flexible bronchoscopic extraction of pediatric airway foreign bodies can be performed safely and can even play a role in cases where rigid bronchoscopy was unsuccessful [4]. This is in direct contrast to the practice by the majority of the members of the American Society of Pediatric Otolaryngology. Although 73% of pediatric otolaryngologists utilize flexible bronchoscopes in their practice and teach residents how to handle both rigid and flexible bronchoscopes, 99% responded