

**Editorial**

Anterior mediastinal masses and anesthesia in children: how far have we come along?

Anesthetic management of diagnostic and surgical procedures in children with anterior mediastinal mass may present life-threatening challenges. Closed claims data from the Australasian Incident Monitoring Study, the United Kingdom Medical Defence Union, and the ASA before 2001 indicated a total of 8 adverse events and claims related to anterior mediastinal mass [1]. The majority of patients were under 18 years of age (7 of 8 claims), and most cases occurred in patients under the age of 8 years (6 of 8 claims). These patients underwent a seemingly trivial procedure, ie, a diagnostic biopsy, and yet 8 patients suffered severe brain damage and death [1]. The common descriptions by several anesthesiologists involved in the claims were bronchospasm or some difficulty with ventilation [1]. These catastrophic incidents should highlight the importance of preoperative clinical and radiographic evaluation, and of communication with the primary and surgical colleagues in devising a management plan for pediatric patients with anterior mediastinal mass.

In 1990, Ferrari and Bedford reviewed a total of 163 consecutive patients, aged 18 years or younger, with a diagnosis of anterior mediastinal mass as a component of their disease, who were admitted to Memorial Sloan-Kettering Cancer Center over a 6-year period [2]. Of these patients, 44 required general anesthesia. Anesthesia management consisted of intravenous or inhalational induction with the patients placed in the supine, semi-Fowler, or sitting position. In most children, the airway was secured with an endotracheal tube, and they were kept either spontaneously breathing or received positive pressure ventilation with or without muscle relaxant. A surgeon and a rigid bronchoscope were readily available in the operating room in case of sudden tracheal compression. There was no anesthesia death or sustained permanent injury. However, the investigators found several episodes of cardiorespiratory compromise [2]. It is important to note that the two patients in that retrospective chart review who presented with preoperative signs and symptoms of respiratory compromise developed complete airway obstruction after administration of muscle relaxant.

In this issue of the *Journal of Clinical Anesthesia*, Stricker et al. summarize their 8 years of experience at Children's Hospital of Philadelphia with 45 children with anterior mediastinal mass who underwent diagnostic and surgical procedures requiring anesthesia [3]. They classified patients based on their preoperative signs and symptoms and radiological findings. For patients with both preoperative symptoms suggestive of cardiopulmonary compromise and radiologic evidence of respiratory and cardiovascular compression (26), anesthetic management in 17 cases consisted of sedation with a natural airway and spontaneous ventilation. Although there were complications associated with the anesthetic, they were easily corrected and without long-term sequelae. Among those who received general anesthesia with endotracheal intubation with muscle relaxant, one patient suffered an episode of wheezing; the hypoxemia was resolved with a bronchodilator. For those who had greater than 50% tracheal compression and cardiopulmonary compromise, the anesthetic approach was sedation, a natural airway with spontaneous breathing, and supine or semi-Fowler positioning; no complications occurred.

Almost two decades have passed between the Ferrari and Bedford and Stricker et al. studies. The severe complications related to children with anterior mediastinal mass undergoing general anesthesia have decreased, as documented by Stricker et al. This decrease in the major adverse events associated with anesthetic management of pediatric patients with anterior mediastinal mass is not simply a perception. According to the ASA Closed Claims Project database, there were only 5 claims involving pediatric patients with mediastinal mass, and all occurred in the 1980s. A search of the current ASA Closed Claim Project database (claims collected through December 2008) representing events that occurred in 2000–2007, indicated no claim that involved a mediastinal mass.

The reasons for the decrease in adverse events associated with anesthetic management of pediatric patients with anterior mediastinal mass most likely involve the increased awareness

by primary care providers, surgeons, and anesthesiologists of the extensive involvement of anterior mediastinal mass. Emphasis on additional pulmonary and cardiology work-up prior to subjecting the pediatric patient with anterior mediastinal mass to anesthesia, use of the sitting or lateral decubitus position depending on the location of the mass, maintaining spontaneous breathing, and avoidance of muscle relaxant by the pediatric anesthesiologists also may have contributed to this decrease. Finally, the anterior mediastinal mass algorithm by experienced pediatric anesthesiologists for the patient so afflicted, certainly provides a guide for the anesthesiologist [4,5].

While we are delighted to learn that the major respiratory and cardiovascular catastrophes have been minimized over the last two decades, we should not underestimate the nature and involvement of anterior mediastinal mass even in the asymptomatic child, which may still lead to respiratory and cardiovascular compromise at any point during the anesthetic. According to Cheung and Lerman, “a clear understanding of the pathophysiology of these masses, together with a thorough history and physical examinations, are essential to minimizing the risk of perioperative complications” [5]. Overall, pediatric patients with anterior mediastinal mass should have an extensive work-up and every specialty involved in caring for

these pediatric patients should communicate with one another in advance, allowing for the proposed procedure to be modified to accommodate the anesthesia management.

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