When Technology Hurts Instead of Helps: The Impact of Supraglottic Airway Devices on Neck Masses During Magnetic Resonance Imaging in Children

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Background/Introduction: General anesthesia (GA) with an airway device is used for radiological studies in children to limit excessive motion and improve image quality; however, scant literature exists describing the potential for devices such as supraglottic airways (SGAs) to cause in vivo magnetic resonance imaging (MRI) artifact and misdiagnosis. We conducted a retrospective observational study to determine how often at our institution SGAs affected the appearance of neck masses in children who received GA for MRIs.

Methods: We queried our electronic databases for patients less than 18 years of age who had neck MRIs under GA with 1) at least one MRI with an SGA and 2) at least one MRI with either a natural airway or endotracheal tube (ETT) during January 2005 to January 2015. Magnetic resonance angiograms were excluded. Two reviewers [VO, AFS] reviewed radiologists' reports and MRI images to assess the impact of the SGA on neck masses.

Results: Over 8000 patients had MRIs with GA during the study period. Twenty-eight patients had at least one neck MRI with a SGA and at least one MRI with an ETT or natural airway. Ten of the 28 patients did not have neck masses and were excluded from the study. Of the 18 patients with neck masses and an airway device change, 12 had masses that were in areas that could be affected by an SGA; of these 12 patients, 11 had a documented change in fibroma appearance. Of the remaining six patients, three had a mass that was on the dorsal neck, and three patients had masses that were distal to the SGA's tip and therefore unaffected by the SGA.

Conclusion: Airway device changes to or from an SGA in patients with neck masses were a rare occurrence at our institution during a recent ten-year period. However, when an SGA is used in a patient with a neck mass where an SGA is typically seated, the appearance of the neck mass is almost always significantly impacted. SGAs may affect the appearance of the submandibular, retropharyngeal and prevertebral cervical regions, creating the potential for diagnostic error during MRIs and treatment issues during radiation therapy. Our findings support avoiding SGAs in children who are undergoing imaging studies and possibly radiation therapy for neck masses.
Figure 1. Sagittal images from two serial magnetic resonance imaging (MRI) studies to assess a 6-year-old child’s head and neck neurofibromas. The child underwent general anesthesia and placement of an airway device for both studies. The left panel shows the use of a supraglottic airway during the child’s 2012 MRI. The right panel shows the child’s 2015 MRI during which a tracheal tube was used. Both MRI images are oriented with the child’s anterior on the left and posterior on the right.