Summary

- General anesthesia (GA) with an airway device is used routinely at some hospitals for radiological imaging studies in children.
- A six-year-old with neurofibromatosis appeared to have growth of her neck neurofibromas on a follow-up MRI because a supraglottic airway (SGA) compressed her neurofibromas during a previous MRI.
- Scant anesthesia literature describes the potential for such devices to cause in vivo magnetic resonance imaging (MRI) artifact and misdiagnosis.

Case Description

- A six-year-old girl (111 cm, 19 kg) with neurofibromatosis type 1 presented for a follow-up MRI of neck and mediastinal neurofibromas in 2015.
- Her medical history included sleep apnea attributed to her fibromas; she required continuous positive airway pressure (CPAP) nightly.
- During a prior MRI with sedation and natural airway, she aspirated and was in the intensive care unit for 11 days.
- Thus, the pt was intubated for the 2015 MRI due to concerns about aspiration and the neurofibromas causing airway obstruction.
- Anesthetic induction with 8% sevoflurane and CPAP via mask proceeded smoothly. An endotracheal tube (ETT) was placed via direct laryngoscopy.
- During the MRI, the radiologist explained that the change from an ETT in the 2011 study to an SGA in the 2012 study produced an artifactual interval improvement of the neurofibromas.
- Reversion to an ETT in 2015 could have caused erroneous assessment of neurofibroma growth if the 2012 study had been the only reference.

Outcome

- The MRI continued and the child had uneventful emergence and recovery.
- The CHOP radiology and anesthesiology departments discussed this case.
- The anesthesiology department adopted the practice of avoiding SGAs during MRIs of supraglottic neck masses.
- A review found that this artifact in vivo had not been described well in the anesthesia literature.

Discussion

- Moderate sedation with natural airway is a safe option for most pediatric MRIs, yet some children may need GA with airway management.
- Neonates and infants are particularly at risk for airway obstruction and complications when sedated for MRI.
- Anesthesiologists should always consider the risks of airway device placement including how an airway device can cause imaging artifacts.
- SGAs may affect the submandibular, retropharyngeal and prevertebral cervical regions, while cuffed ETTs can alter subglottic anatomy.
- Anesthesiologists and radiologists should communicate to optimize the diagnostic capability of a study while maintaining a safe airway.

References: Arthurs et al., Curr Opin Anesthesiol 2013; Bosemani et al., Childs Nerv Syst 2015; Zaballos et al., Anesthesia 2010; Schieble et al., Pediatr Radiol 2008.