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Introduction: Image-guided sclerotherapy is gaining acceptance as a primary therapy for low-flow vascular malformations. Due to its safety and efficacy, doxycycline is a commonly used sclerosant. Severe pain is a well-described side effect of sclerotherapy with ethanol, but it is less known after use of doxycycline^{1,2}. We reviewed the analgesic requirements in 11 rounds of doxycycline sclerotherapy in 2 pediatric patients and discuss the anesthetic implications of this procedure.

Patient A is a healthy 6 year-old girl with a veno-lymphatic malformation of the right hand, arm, axilla, and chest. She underwent 6 rounds of doxycycline sclerotherapy over a 10 month period. Patient B is a healthy 7 year-old with a venous malformation of his right leg extending from his foot to his buttock and groin who underwent 5 rounds of sclerotherapy over 2 years. All procedures were done as an outpatient procedure by the same interventional radiologist and anesthesiologist. In all cases the patients received oral premedication with midazolam +/- acetaminophen-hydrocodone. All underwent inhalational induction, followed by either intubation or LMA placement and were maintained with sevoflurane. Doxycycline 7-42 mg/kg (average 29 mg/kg) was used in all cases in procedures lasting an average of 65 min. (45-83 min range). Peripheral nerve blocks were performed in 2 out of the 11 cases. Opioids used for perioperative analgesia include fentanyl, morphine, hydrocodone, meperidine, and oxycodone. Dexmedetomidine (average 0.48 mcg/kg), was used in all but 1 case whereas ketorolac or ibuprofen was used in 8/11 cases. In all cases the patient was extubated in the IR suite and recovered in PACU. There were no adverse respiratory events reported, and patients were discharged home after average PACU stay of 113 minutes (35-246 minutes).

Discussion:

Doxycycline is a member of the tetracycline family, and while the mechanism of sclerosant activity is unknown, its efficacy and safety has been demonstrated in management of pleural and pericardial effusions. Pain is a significant, but less recognized side effect of doxycycline sclerotherapy, usually lasting 1-3 hours after the procedure. Our two patients demonstrate a consistent need for an increased total intra and postoperative dose of opioid and NSAIDs and a prolonged need for recovery time. The possibility of associated respiratory depression, sedation, PONV and inpatient admission should be carefully considered. Regional anesthesia, when possible due to location of the lesion, should be part of the anesthetic plan.

References:

1. Churchill, P et al. Journal of Pediatric Surgery, 2011.
2. Wiegand, S et al. Head & Neck, 2011.

	Case Number	Hydrocodone (mg/kg)	Fentanyl (mcg/kg)	Morphine (mg/kg)	Other (mg/kg)
Patient A	I	0.16	2.63	0.16	
	II	0.19	1.86	0.11	
	III	0.08	2.66	0.08	
	IV	0	2.6	0.08	
	V	0.2	2.83	0	Oxycodone 0.21, Supraclavicular Block
	VI	0.1	4.21	0.25	
Patient B	I	0.19	1.44	0.07	
	II	0.17	2.39	0.14	
	III	0.18	2.28	0.23	Meperidine 0.59
	IV	0.1	2.68	0.08	
	V	0.2	2.69	0.3	Meperidine 0.43, Ankle Block