

confirmed by the ultrasound findings and the presence of anterior bilateral B lines prompted the early initiation of appropriate therapy. The assessment of heart function showed normal left ventricular systolic function. As cardiogenic pulmonary edema can occur in patients with an adequate cardiac output, we measured filling pressures, which were in the normal range; this excluded a mechanism related to fluid overload. In the setting of tocolysis, although nicardipine-associated pulmonary edema is a rare complication, it may be confused with cardiogenic pulmonary edema or acute respiratory distress syndrome.<sup>5</sup> In our case, ultrasound excluded cardiac dysfunction. Actually, the ultrasound picture mimicked an acute respiratory distress syndrome; several irregular B lines were delineated by spared areas and subpleural consolidation.

In patients with acute heart failure, guidelines recommend an echocardiogram if the natriuretic peptide level is above the exclusion threshold and the ECG is abnormal.<sup>6</sup> A chest X-ray is routinely performed in patients with pulmonary edema. In a previous case report,<sup>7</sup> a chest X-ray did not contribute effectively to the diagnosis of pulmonary edema associated with tocolytic therapy. Although not currently included in guidelines, lung ultrasound has several advantages in parturients which include: no requirement for intrahospital transfer, no radiation exposure and it is a non-invasive process. In contrast to echocardiography, the learning curve is short, even for non-specialists. The use of chest ultrasound in the supine position in pregnant patients can be a limitation, although a previous study showed its feasibility.<sup>8</sup> Future studies are required to determine the impact of chest ultrasound on the outcome of parturients with pulmonary edema.

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## Transnasal topical sphenopalatine ganglion block to treat tension headache in a pregnant patient



Since its original description,<sup>1</sup> sphenopalatine ganglion (SPG) block has been used to treat many types of pain including headaches and facial pain syndromes.<sup>2</sup> While its use has been documented during labor and the postpartum period,<sup>3,4</sup> this is the first report of successful treatment of headache with repeat administration of SPG blocks in a pregnant patient whose pain was poorly controlled with systemic analgesics.

A 41-year-old woman with twin gestation at 26 weeks and 3 days was hospitalized for management of twin-to-twin transfusion syndrome. She had experienced migraine and tension headaches since childhood lasting from several hours to days at a time. On admission, her headache, of eight days duration, was partially relieved with acetaminophen, ibuprofen and sumatriptan. Her symptoms were consistent with tension headache with a pain intensity between 4/10 and 10/10. She was concerned about possible untoward fetal effects of systemic medications, and readily agreed to our offer of SPG block.

She was treated with topical transnasal SPG blocks using cotton-tipped applicators.<sup>5</sup> A 10-cm segment of Luer locking-intravenous tubing was affixed to a 15-cm plastic hollow bore cotton-tipped applicator. To ensure that the cotton tips were well-soaked, the appli-

cator shaft and the extension tubing were primed with 4% lidocaine. A tuberculin syringe filled with 4% lidocaine 0.7 mL was attached. The cotton tip was lubricated with 5% lidocaine ointment. The patient was positioned supine with a pillow beneath her shoulders to achieve neck extension. An applicator was then introduced into each naris and gently advanced until the cotton tips abutted the posterior nasopharyngeal wall, which was easily appreciated as distinct resistance or 'bounce'. Every three minutes, 4% lidocaine 0.1 mL was administered through each applicator. Each procedure lasted about 20 min. The patient tolerated the procedures well with minimal discomfort. Following the first SPG block, her pain was reduced by half for approximately 2 h, after which it returned to pre-treatment levels. The procedure was repeated later that day, again with definite but transient pain relief. Overnight, she required two doses of acetaminophen. The following morning, another SPG block completely relieved her pain. Although she remained pain-free 8 h later, we chose to perform another block. We continued with twice-daily SPG blocks for a total of seven, after which she did not experience a recurrence of the headache for the remainder of her hospital stay. At 27 weeks of gestation, she went into preterm labor and underwent cesarean delivery under epidural anesthesia. She was discharged home on postoperative day four and remained headache free for several weeks.

Headache during pregnancy is typically managed with systemic analgesics. Although SPG block was first described as a treatment for headache in 1908,<sup>1</sup> few physicians are familiar with its use and SPG block is seldom considered as an option for treatment of headache. The mechanism by which SPG block relieves headache remains unclear. Anatomically the SPG is located in the pterygopalatine fossa in close proximity to the sphenopalatine foramen, which is located just posterior to the middle nasal turbinate and separated from the nasal cavity by as little as 2 mm of nasal mucosa. This allows local anesthetic deposited in the nasal cavity to diffuse into the ganglion. Preganglionic parasympathetic nerve fibers of the superior salivatory nucleus synapse in the SPG. Post-ganglionic sympathetic fibers from the cervical sympathetic plexus pass through the SPG uninterrupted. These autonomic efferent fibers join the somatosensory afferent branches of the maxillary division of the trigeminal nerve in the pterygopalatine fossa.<sup>6</sup> The mechanism of pain relief is thought to be related to interruption of these neural pathways.

Patients may require repeated SPG blocks in order to break the cycle of pain.<sup>7</sup> In our patient the first two SPG blocks provided only transient pain relief, but subsequent procedures resulted in sustained analgesia. In our experience patients tolerate the procedure well. Pain on insertion of the applicators is minimal, and is no

longer perceived once the cotton tips are properly positioned. Contraindications to SPG blocks include localized infection and allergy to local anesthetics. Nasal pathology that would prevent passage of the applicators, such as a deviated septum, may preclude use of this procedure. We suggest that SPG block be considered for the treatment of headache during pregnancy. The profound pain relief that can be achieved coupled with the avoidance of systemic medications is well suited to the pregnant patient.

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## Ventricular tachycardia associated with ondansetron and phenylephrine administration during spinal anaesthesia in pregnancy



We report a case of ventricular tachycardia (VT) following induction of spinal anaesthesia for a category-3 caesarean section. Our patient was 35-year-old, para 1, undergoing caesarean section at 40 weeks and three days of gestation because of failure to progress in labour. Her pregnancy had been uncomplicated and there was no evidence of fetal compromise. There was no medical history of note, her body mass index was