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Ultrasound guided subarachnoid block for a scoliosis patient

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Introduction

Scoliosis is defined as lateral deviation of normal curvature of spine. Hence Scoliosis is considered to be a challenge for the anesthetist to perform subarachnoid blockade using conventional anatomic landmark method. Idiopathic scoliosis is characterised as mild (11–25°), moderate (25–50°), or severe (>50°) based on the degree of lateral curvature (Cobb angle). With proper alignment, mild idiopathic scoliosis can be treated. Moderate idiopathic scoliosis is treated with a paramedian approach on the convex side of the curve, a midline approach with angulation towards the convex side, or imaging, such as ultrasonography.[1] Imaging may be used to treat severe idiopathic scoliosis, or another kind of pain management may be sought.

Poor surface anatomic landmarks are strongly predictive of technical difficulty in neuraxial blockade. In patients with challenging anatomic landmarks, preprocedural ultrasound imaging makes it easier to perform spinal anaesthesia.[1] Ultrasound is preferred over other imaging such as fluoroscopy and Computerised tomography because it is portable, relatively inexpensive and free of ionizing radiation. [5]

Keywords: Scoliosis, Ultrasound, ASA II

Case report

54-year-old female, ASA II, MP III, k/c/o hypothyroidism on tab Thyronorm 25mg OD was posted for total abdominal hysterectomy and bilateral Salphingoophorectomy in view of postmenopausal bleeding. On radiographic examination the patient had severe dextrorotatory thoracic scoliosis with a Cobb angle of 60 degrees and a compensatory levorotatory lumbar curve of 40 degrees. However, she had preserved pulmonary function without evidence of restriction or obstruction, and her coagulation studies were normal. Hence, we anticipated that ultrasound-guided spinal anesthesia would be feasible, and following a discussion of the risks and benefits, the patient gave consent to the procedure. Patient followed preoperative fasting guidelines as per hospital policy. Antianxiety premedication tab alprazolam 0.25 mg and proton pump inhibitor pantoprazole was prescribed the previous night of the surgery.

Routine preoperative monitoring device was applied such as 5 lead ecg, noninvasive blood pressure monitoring and pulse oximetry and baseline vitals were recorded. Intravenous access was secured with an 18G intravenous cannula. The patient was provided with supplemental oxygen via facemask and placed in the left lateral decubitus position. Under sterile aseptic precautions the parts were painted and draped and ultrasound probe was prepared for the procedure A pre-procedural scan was performed using a curved-array low-frequency (2-5 MHz) ultrasound probe (Sonosite,) placed 1–2 cm lateral to the spinous process (ie, in the paramedian sagittal plane) at the lower back marker directed cranially. A medial tilt during the scan identifies the spine in a paramedian sagittal oblique (PMSO) plane. First, the sacrum is identified as a flat, hyperechoic structure with a large acoustic shadow anteriorly. When the transducer is slid in a cranial direction, a gap is identified between the sacrum and the lamina of the L5 vertebra, which is identified as the L5–S1 interlaminar space, (L5– S1) gap. The L3–4 and L4–5 interlaminar spaces can now be located by counting upward. The posterior dura is generally more hyperechoeic than the ligamentum flavum. The thecal sac with the cerebrospinal fluid is the anechoic space anterior to the posterior dura. L3-L4 space and L4-L5 space was identified and marked using the ultrasound probe. Lumbar puncture was done in the L3-L4 space using 25 G quienke Babcock spinal needle. Free flow of CSF was confirmed without any blood-tinged aspirate. An intrathecal solution of 0.5% isobaric bupivacaine 3.5 mL and 20 microgram Fentanyl was administered. The sensory block was assessed by pinprick sensation, and the motor block was assessed by an inability to perform a straight leg raise. A sensory block to the T6 dermatome with complete motor blockade was obtained within ten minutes of completion of the injection. The patient’s subsequent intraoperative event such as hypotension was managed with fluids and bolus dose of vasopressor ephredine. Postoperative period was uneventful without any complications.

Discussion

The anaesthesia practitioner faces a particular difficulty with the scoliotic spine, which might compromise general or regional anaesthesia. Congenital, neuromuscular, and idiopathic scoliosis are the three types of scoliosis. Scoliosis is defined as >10-degree lateral curvature of the spine. The Cobb angle determines the degree of lateral curvature.

In the coronal plane, the Cobb angle is the distance between the most inclined vertebral bodies. The superior end plate of the cephalad vertebrae with the highest angulation is paralleled by a line. A second line is drawn parallel to the caudal vertebrae's inferior end plate with the highest angulation. The Cobb angle is formed by drawing a perpendicular line from each of these lines. There is also rotation of vertebral bodies.[2]

The spinous processes point towards the midline (concave-side) of the curve, whereas the vertebral bodies rotate towards the convex-side. In untreated patients, there is a strong linear association between the Cobb angle and vertebral rotation in both thoracic and lumbar curves, with greatest rotation occurring at the apex of the scoliotic curve.[3]

Neural damage, spinal hematomas, post-Dural puncture headache, and infection can all occur if neuraxial anaesthesia is difficult to perform. Furthermore, it reduces efficiency while also increasing patient discomfort and discontent.

Anatomic deformity has also been demonstrated to be an independent predictor of difficulty performing neuraxial anaesthesia.

Ultrasound may enhance the success rate in patients who are at high risk for problematic placement. Ultrasound can provide sufficient anatomic detail to ascertain the location, depth, and angle needed to successfully place a spinal or epidural catheter.[4]Anesthesiologists who are experienced in neuraxial ultrasonography, the use of ultrasound significantly reduces the technical difficulties of spinal anesthesia in patients with abnormal spinal anatomy compared with the conventional landmark-guided technique. Patient compliance is also better because higher first prick success.

References

1. Chin KJ, Perlas A, Chan V, Brown-Shreves D, Koshkin A, Vaishnav V. Ultrasound imaging facilitates spinal anesthesia in adults with difficult surface anatomic landmarks. The Journal of the American Society of Anesthesiologists. 2011 Jul 1;115(1):94-101.

2. Bowens C, Dobie KH, Devin CJ, Corey JM. An approach to neuraxial anaesthesia for the severely scoliotic spine. British journal of anaesthesia. 2013 Nov 1;111(5):807-11.

3. Wong SW, Niazi AU, Chin KJ, Chan VW. Real-time ultrasound-guided spinal anesthesia using the Sonix GPS® needle tracking system: a case report. Canadian Journal of Anesthesia/Journal canadien d'anesthésie. 2013 Jan;60(1):50-3.

4. Chin KJ, Perlas A, Chan V, Brown-Shreves D, Koshkin A, Vaishnav V. Ultrasound imaging facilitates spinal anesthesia in adults with difficult surface anatomic landmarks. The Journal of the American Society of Anesthesiologists. 2011 Jul 1;115(1):94-101.

5. Niazi AU, Chin KJ, Jin R, Chan VW. Real-time ultrasound-guided spinal anesthesia using the Sonix GPS ultrasound guidance system: a feasibility study. Acta Anesthesiologic Scandinavica. 2014 Aug;58(7):875-81.