Failed Spinal Anaesthesia Perfomed in an Achrondoplastic Dwarf. What Next?

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ABSTRACT

Introduction: Managing achondroplastic patients warrants anatomical and physiological considerations for significant variations in the airway as well as the spine in regional techniques.

Case: We report a 32-year-old achrondroplastic dwarf male who was taken up for emergency ureteroscopy and laser stone fragmentation. He had scoliosis over the lumbar region from L2 to L4 with rest of spine was normal. We administered 2 ml of 0.5% bupivacaine (heavy) with 30 µg Buprenorphine into subarachnoid space owing to short stature but block height was inadequate. The procedure was repeated and 1ml of 0.5% bupivacaine (heavy) and we could achieve a sensory level of T10. No technical difficulty was faced during the procedure.

Conclusion: Neuraxial anaesthesia is relatively safe in managing achrondoplastic dwarf but needs caution for the unpredictability of dosage and spread of local anaesthetic.

Keywords: Achondroplasia, Anesthetic Management, Dwarfism, Spinal Anesthesia

INTRODUCTION

Achondroplasia is the most common entity with short-limbed dwarfism. Perioperative management of dwarf population poses distinctive challenge to anaesthesiologist in both general and regional anaesthesia attributed to their anatomic differences. Till date no consensus is available regarding the perioperative management of short stature and though clinical reports are available, results are conflicting. We present a case of short stature posted for ureteroscopy and laser stone fragmentation under spinal anaesthesia alone.

CASE REPORT

A 32-year-old achrondroplastic dwarf male was wheeled to our operating room for emergency ureteroscopy and laser stone fragmentation. He was otherwise normal with no known comorbidities. On examination, his height was 129 cm and weight 52 kg. His cardiovascular and respiratory systems examination were normal. He did not have any obvious spinal deformity other than scoliosis in the lumbar region. Assessment of airway was done and he was classified as Mallampati grade 2. His spine examination was unremarkable except for scoliosis over the lumbar region from L2 to L4 as confirmed from his radiograph. Spinal spaces were palpable. His preoperative baseline investigations were within normal limits and he received premedication of ranitidine 150 mg iv preoperatively. In the operating room he was connected to pulse oximeter, non-invasive blood pressure, electrocardiogram and end tidal carbon dioxide.

Our plan was to take up the case under neuraxial anaesthesia with low dose of local anaesthetic attributed for his short stature. Plan for general anaesthesia was kept as backup and difficult intubation is not anticipated in our case.

The patient was placed in sitting position and subarachnoid block was given with 26 G Quincke needle at L2-L3 interspace. 2 ml of 0.5% bupivacaine (heavy) with 30 µg Buprenorphine (0.1ml) was administered after confirming free flow of cerebrospinal fluid. The patient was immediately placed supine. Even after 30 min, he was just able to flex his knees and he could move his feet freely (Bromage grade 2). Sensory level was noted upto just below the knees. The patient was explained on table and considering the low dose administered for his short stature, the procedure was repeated and 1ml of 0.5% bupivacaine (heavy) was administered in the same space after confirming free flow of cerebrospinal fluid. The patient was made supine immediately after the procedure. Block height of T10 level was achieved after 4 min. The surgery lasted for 40 min. There was no hemodynamic change observed and perioperative period was uneventful.

DISCUSSION

Achondroplasia, the most common amongst the etiology of short-limb dwarfism, is related with several bony changes in face, neck and spine posing challenge to both general and regional anaesthesia. Large head, maxillary hypoplasia, large mandible and macroglossia may pose restricted mouth opening. Fusion of the atlanto-occiptal joint may limit neck extension. Other anomalies include an exaggerated lumbar lordosis, thoracic kyphoscoliosis, generalized spinal stenosis, and vertebral deformities that may pose difficulty in

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subarachnoid block.[1]

Though literature could showcase case reports on caesarean section on achrondoplastic dwarfs, there is a paucity on data about perioperative management in achrondoplastic dwarfs. Though spinal anaesthesia is technically difficult for the reasons mentioned above, our plan is to try single shot spinal anaesthesia as the spaces were well palpable on preoperative assessment. Needle was inserted in the best palpable space and ultrasound guided spinal anaesthesia was thought of if our attempt had failed. Plan for general anaesthesia was kept as backup.

From the available studies, Bakhshi RG et al, in his case of femur surgery, performed combined spinal epidural and he had administered only 1.5 mL of 0.5% bupivacaine (heavy) owing to his short stature and block height of T8 was achieved.[2] Yet another study by Trikha et al, performed combined spinal epidural and he had administered only 1.0 mL of heavy 0.5% bupivacaine and block height of T6 was achieved for vesicovaginal fistula repair.[3] Those reports available on caesarean section also mentioned use of low doses.[1] Although, reports of dry tap and failed spinal anaesthesia were noted before,[4,5] we could successfully pass the needle into the right space at our second attempt and 2 ml of 0.5% bupivacaine (heavy) with 30 µg Buprenorphine (0.1 ml) was administered. Upon patchy effect, accounting for the possibility of low dose administered, we decided to repeat the procedure with low dose of the drug. Possibility of hemodynamic instability and high spinal was anticipated. Ultrasound guided spinal anaesthesia was thought of if our attempt had failed and general anaesthesia was kept as backup. The surgery lasted for 40 min and perioperative period was uneventful.

The potential problems posed by spinal abnormalities, uncertain dose requirement and lack of clinical experience have probably deterred anaesthetists from using spinal anaesthesia in these patients.[3] Our patient had no pre-existing illness. Moreover, there is no documented neurological abnormalities following spinal anaesthesia in patients with achondroplasia have been noted

Meticulous preoperative assessment of spinal space is of utmost importance in this subset of patients. We conclude that neuraxial anaesthesia is relatively safe in the perioperative management of patients with short stature but needs caution for the unpredictability of dosage and spread of local anaesthetic.

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