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## C-arm fluoroscopic-guided subarachnoid block in a super morbidly obese patient

Sir,

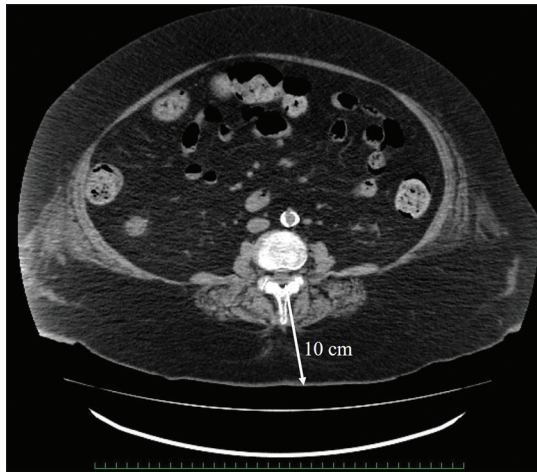
Regional anaesthesia often offers several advantages for morbidly obese patients. However, needle insertion for central neuraxial blockade in these patients is challenging.<sup>[1]</sup> We report successful spinal anaesthesia under C-arm fluoroscopic guidance in a 68-year-old super morbidly obese female patient with a body mass index (BMI) of 51 kg/m<sup>2</sup> undergoing intramedullary nailing of right femoral diaphyseal fractures.

The patient had old cerebral infarction with right hemiplegia under medication with 100 mg aspirin daily. During rehabilitation, she fell and had right femoral diaphyseal fractures diagnosed by radiograph. Subsequently, whole-body computed tomography (CT) scan was performed to rule out other traumas. Because of diminished respiratory conditions, spinal anaesthesia was selected. We determined the spinal needle insertion point (paramedian approach) and measured the distance from the skin to the subarachnoid space by examining the axial CT scan around the L3/L4 lumbar interspace [Figure 1], suggesting that the distance was approximately 10 cm. Due to anticipated difficulty, we decided to perform spinal anaesthesia under C-arm fluoroscopic guidance instead of the conventional or ultrasound (US)-guided spinal anaesthesia.

In the operating theatre, we observed her lumbar spine structure from a lateral view under C-arm fluoroscopic guidance. After the L3/L4 interspace was identified, the tip of a 25-G, 90 mm Quincke needle was introduced in the L3/L4 lumbar interspace via the paramedian approach [Figure 2]. After inserting the needle fully with a hard push into the skin, the backflow of clear cerebrospinal fluid was obtained. Subsequently, isobaric bupivacaine (0.5%, 15 mg) was injected. Complete analgesia below the thoracic 6 level was achieved in 10 min after bupivacaine administration. Total procedure time was 8 min, with a total fluoroscopic exposure of less than 5 s using the one-shot imaging method. Her surgery and postoperative course were uneventful.

Fluoroscopy-guided lumbar puncture has been generally performed in the department of radiology. Radiologists have been frequently consulted to perform lumbar puncture under fluoroscopic guidance because of the current increase in the BMI of the general population.<sup>[2]</sup> Accordingly, outside the operating theatre, lumbar puncture under fluoroscopic guidance is common. However, there have only been a few reports describing fluoroscopy-guided neuraxial block performed in the operating theatre.<sup>[3,4]</sup>

Ultrasonography could help in the pre-anaesthetic evaluation of the lumbar spine in predicted difficult cases. Recently, spinal anaesthesia under real-time US guidance has been reported in predicted difficult cases.<sup>[5]</sup> However, there have been some problems

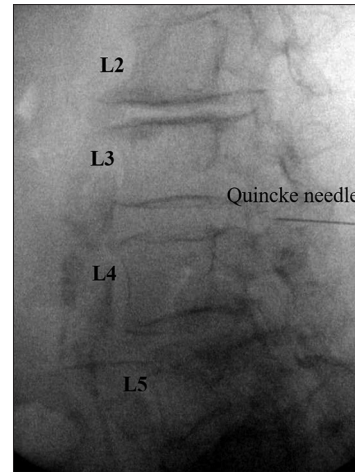


**Figure 1:** In the preoperative computed tomography scan at the level of the L3/L4 interspace, the estimated distance from the spinal needle insertion point to the subarachnoid space is approximately 10 cm

with that technique.<sup>[5,6]</sup> Similar to the conventional technique, US-guided techniques occasionally indicate an incorrect intervertebral space.<sup>[6]</sup> Furthermore, it has been reported that much longer procedural time is required, and procedural difficulty is significantly higher in the US-guided technique compared to the conventional technique in predicted difficult cases.<sup>[5]</sup> Real-time US-guided spinal anaesthesia requires one-handed manipulation of a spinal needle. In contrast, fluoroscopic guidance enables practitioners to visualise the accurate intervertebral space and needle paths in real-time and use both hands for needle manipulation. We estimated that the patient could not maintain the lateral decubitus position for a prolonged time due to poor respiratory conditions and pain. Furthermore, C-arm machine is routinely available in orthopaedic theatres and hence its use for assessing spinal needle position does not entail additional expenditure. Therefore, we chose the C-arm fluoroscopy-guided technique from the beginning. In this case, the patient's lumbar spine was observed only from a lateral view. However, observation from both lateral and anteroposterior views is preferable to detect the exact needle tip position safely.

Regarding practitioners' exposure to radiation, previous reports described that the one-shot imaging method could effectively reduce radiation exposure compared to the continuous imaging method.<sup>[7]</sup> In this case, we also used the same method to reduce exposure.

In conclusion, in predicted difficult cases, the neuraxial block under fluoroscopic guidance can be helpful owing to easy visualisation of the accurate



**Figure 2:** The C-arm fluoroscopic image of the patient's lumbar spine from the lateral view shows that the Quincke needle is accurately proceeding to the L3/L4 interspace

intervertebral space and needle paths in real-time and needle manipulation with both hands. However, this technique is limited to non-pregnant patients.

## DECLARATIONS

### Ethics approval and consent to participate

Not applicable.

### Consent for publication

Written informed consent was obtained from the patient for publication of this case report.

### Availability of data and materials

The data are not available for public access because of patient privacy concerns but are available from the corresponding author on reasonable request.

### Acknowledgments

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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