

# Combined Sciatic-Femoral Nerve Block For Unilateral Lower Limb Surgery In Kyphotic Patient: A Case Report.

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## ABSTRACT

Kyphosis is the term used to describe an increased convexity of the thoracic spine resulting in hunch back appearance, which has a normal range of 20<sup>o</sup>- 50<sup>o</sup>. The cause is unknown and the condition appears to be multifactorial and is seen more frequently in males than females. Symptoms can range from mild, requiring no treatment or conservative treatment to severe symptoms that are best treated with surgery. In kyphotic patients, airway management and cardio-respiratory changes make general anaesthesia hazardous where as regional anaesthesia is scared with technical problems due to abnormal curvature of spine and unpredictability of level of anaesthesia. In such challenging rare cases, peripheral nerve block techniques may be the anaesthesia of choice as it eliminates the disadvantage of both regional and general anaesthesia.

**Keywords:** Kyphosis, Airway management, general anaesthesia, regional anaesthesia.

## INTRODUCTION

Patients with spine abnormalities present unique challenges to the health care provider responsible for providing sedation and anaesthesia during surgical procedure. Spinal deformities may cause difficulty in both intubation and regional anaesthesia. Kyphosis is the term used to describe an increased convexity of the thoracic spine resulting in hunch back appearance, which has a normal range of 20<sup>o</sup>- 50<sup>o</sup>.<sup>[1]</sup> Gibbus is a sharp posterior angulation due to localised collapse or wedging of one or more vertebrae.<sup>[2]</sup>

Kyphosis generally affects major part of the thoracic spine, i. e. cervical, thoracic and sacral region.<sup>[3]</sup> The cause is unknown and the condition appears to be multifactorial and is seen more frequently in males than females. It can result from development problems, degenerative diseases (such as arthritis), tubercular infection, osteoporosis with compression fracture of the vertebrae and trauma to the spine.<sup>[1,2]</sup> Symptoms can range from mild, requiring no treatment or conservative treatment to severe symptoms that are best treated with surgery. Patients

with severe deformity may cause severe pain and discomfort, breathing and digestion difficulties, cardiovascular irregularities and neurological problems.

Mild curves require only back-strengthening exercises and postural training. More severe curvature in a child who still has some years to growth ahead responds well to a period of 12-24 months in a brace, The older adolescent or young adult with a rigid curve of more than 60<sup>o</sup> may need operative correction and fusion.<sup>[4]</sup>

In kyphotic patients, airway management and cardio-respiratory changes make general anaesthesia hazardous where as regional anaesthesia is scared with technical problems due to abnormal curvature of spine and unpredictability of level of anaesthesia. We are presenting a case of a kyphotic female patient for unilateral lower limb orthopaedic surgery in which general and spinal anaesthesia was challenging so it was conducted under combined sciatic and femoral nerve block (Winnies block).

## CASE REPORT

A forty year old female with 50 kg weight, with history of road traffic accident presented with fracture proximal 1/3rd tibia planned for open reduction and internal fixation of fracture. She had a fixed spine deformity with forward bending at thoraco-lumbar region since birth with inability

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to lie supine due to hump [Figure 1]. No history of motor, sensory symptoms or bowel incontinence, TB, diabetes, previous thoracic surgery, radiation exposure, carcinoma, bone pain, muscle pain, fatigue, dyspnoea etc. No significant past medical, surgical or obstetrical history.

**On Examination:** Patient was average built with Modified Mallampati Score III. Cardiovascular and central nervous system didn't show any significant findings but respiratory system revealed shallow thoracoabdominal breathing with bilateral decreased air entry.

**On Investigations:** Haematological & Biochemical investigations were normal but chest X-ray showed crowding of lower ribs [Figure 2 & 3] and Pulmonary function test revealed restrictive pattern. Electrocardiogram showed right ventricular hypertrophy and ECHO showed mild pulmonary artery hypertension and right ventricular hypertrophy.

### **Procedure**

Following explaining procedure, signing informed consent, applying minimal non-invasive standard monitoring, patient was shifted to operation theatre. Emergency airway cart was kept ready. Patient was sedated with injection dexmedetomidine 1 µg.kg-1, and injection midazolam 1 mg.

Femoral nerve block was performed in supine position, palpating the femoral artery and 20ml of 0.375% Bupivacaine (15ml 0.5% Bupivacaine + 5 ml Normal saline) injected in nerve sheath lateral to the femoral artery following eliciting paraesthesia. Following anaesthesia of the trajectory of nerves, the patient repositioned laterally to perform sciatic block with the classic approach of Labat. Patient was placed in lateral decubitus position (operative side up), and the leg was flexed at the knee. We drew a line between the greater trochanter to the posterior superior iliac spine (PSIS) and a second line from the greater trochanter to the patient's sacral hiatus (Winnie's modification). Then we determined the point of initial needle insertion by drawing a line perpendicular from the midpoint of the first line to its intersection with the second line. A fourth line can be drawn along the "furrow" formed by the medial edge of the gluteus maximus muscle and the long head of the biceps femoris muscle. The needle was introduced perpendicular to the spherical skin plane. With the advancement of the needle, twitches of the gluteal muscles were observed. Once the gluteal twitches disappeared, brisk plantar flexion was seen then after negative aspiration for blood, 28 mL of 0.375% Bupivacaine (21ml 0.5% Bupivacaine + 7 ml Normal saline) was injected slowly.

Twenty minutes after the local anaesthetic was injected, with the patient in dorsal decubitus, the sensory and motor blockade was assessed in the limb to be operated and in the contralateral limb. Loss of cold and pain (pinprick) sensations was present on

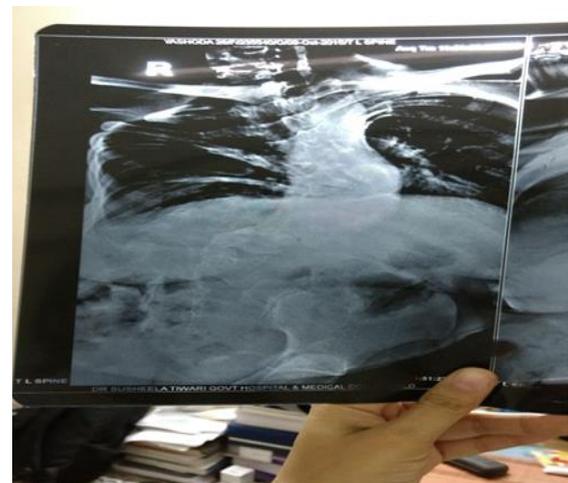
the different paths of the femoral, lateral cutaneous, obturator, common peroneal, and tibial nerves. The surgery and anesthetic outcomes were uneventful under femoral and sciatic nerve block and surgery was conducted successfully under this block.



**Figure 1: A fixed spine deformity with forward bending at thoraco-lumbar region.**



**Figure 2: Chest X-Ray showing crowding of ribs.**



**Figure 3: Chest X-Ray AP view.**

## DISCUSSION

We had chosen to give regional anaesthesia in these patients as there was a definitive evidence that regional anaesthesia would be better than general anaesthesia in these patients. Peripheral nerve blocks can replace general anaesthesia and central neuraxial block for lower extremity surgery and perhaps are ideal for these kind of patients in whom there is high failure rate of central neuraxial blockade and several risks in general anaesthesia.. Other benefits of nerve block are more muscle palsy which is of great importance in reduction of fracture. Also duration of analgesia is more.

In kyphotic patients there is high chance of difficulty in spinal and epidural anesthesia due to difficulty in identifying the landmarks. There is high probability of inadequate and unpredictable level of block, difficulty in identify the landmarks and positioning & obliterated interspinous gap makes spinal and epidural technically difficult,. The CSF volume is decreased in kyphotic patients so small volume of anaesthetic agent may spread up to higher level resulting in higher incidence of total and high spinal block.<sup>[5]</sup> Another problem is that hyperbaric local anaesthetic solution may pool in dependent part which may cause inadequate block.<sup>[6]</sup>

Epidural anaesthesia is also challenging due to difficult positioning of patient, technical difficulty passing needle ,unpredictable catheter direction and altered epidural space.<sup>[7]</sup>

General anaesthesia (GA) becomes very difficult in kyphotic patients because these patients have high chances of pulmonary hypertension and right heart failure. If it occurs with co -existing hypovolemia and infections,then there is high risk of morbidity and mortality.<sup>[8]</sup> As during GA positive pressure ventilation may decrease venous return which along with negative inotropic effect of anaesthetic agents may lead to decrease in blood pressure. Also abnormal spine makes intubation and ventilation very difficult, positive pressure ventilation decrease venous return, so along with negative inotropic effect of anaesthetic agents may lead to decrease in blood pressure. In postoperative period after general anaesthesia laryngeal incompetence and impaired swallowing decrease the airway defense mechanism all this factors lead to delay extubation and can lead to postoperative ventilator support.<sup>[9]</sup>

## CONCLUSION

So we can conclude, peripheral nerve block techniques may be the anaesthesia of choice in such cases where it eliminates the disadvantage of both regional and general anaesthesia. And perhaps are ideal for high risk patients in whom there is high failure rate of regional and general anaesthesia.

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