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CASE REPORT

Ultrasound-guided femoral and sciatic nerve block in a patient with shrinking lung syndrome: A case report

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SUMMARY

Shrinking lung syndrome (SLS) is a pulmonary complication mainly associated with systemic lupus erythematosus (SLE), although it is also seen in other rheumatologic conditions. Its prevalence is thought to be 0.5–1% among patients with SLE. This syndrome is characterized by progressive dyspnea, episodic pleuritic chest pain, a restrictive pattern on pulmonary function tests, bilateral diaphragm elevation, and reduced lung volumes with no evidence of parenchymal lung disease. General anesthesia in patients with SLS may be associated with increased mortality and morbidity, while neuraxial anesthesia or peripheral nerve blocks can be safe options. Herein, we report a case of ultrasound-guided femoral and sciatic nerve block for unilateral knee septic arthritis debridement in a patient with SLS. The patient was protected from both prolonged mechanical ventilation and pulmonary complications by performing the femoral and sciatic nerve block for this operation.

Keywords: Femoral block; restrictive lung disease; sciatic block; shrinking lung syndrome; systemic lupus erythematosus; ultrasound-guided.

Introduction

Shrinking lung syndrome (SLS) is a complication of systemic lupus erythematosus (SLE). It is often seen in patients with long-standing SLE diagnosis and is estimated to occur in 0.5–1% of patients.[1] SLS is a rare pulmonary manifestation of SLE, characterized by unexplained dyspnea, a restrictive pattern on pulmonary function tests, and radiographic evidence of diaphragm elevation. We would like to present a case of a successful femoral sciatic nerve block in a patient with SLE and SLS for right knee septic arthritis debridement operation. Written informed consent was obtained from the patient for publication of this case report.

Case Report

A 32-year-old female patient with a history of SLE, SLS, and Raynaud's disease was followed up by a rheumatology specialist for 18 years. She was taking methylprednisolone, hydroxychloroquine daily, and canakinumab once a month. She also used to be on warfarin therapy for left subclavian artery thrombosis until 15 days ago. Our patient was admitted to the intensive care unit postoperatively after cesarean section under general anesthesia 4 months ago. While investigating her dyspnea then, she was diagnosed with SLS by the pulmonologist and received pulse steroid and cyclophosphamide therapy.

The patient, who had been followed up in the rheumatology ward for 15 days due to uncontrolled fever (38 °C and above), pain, and swelling in her knee, was diagnosed with knee septic arthritis and scheduled for right knee septic arthritis debridement. In our preoperative anesthesia evaluation, she presented with dyspnea on exertion, her breath sounds were diminished in the lower lobes, and SpO_2 was

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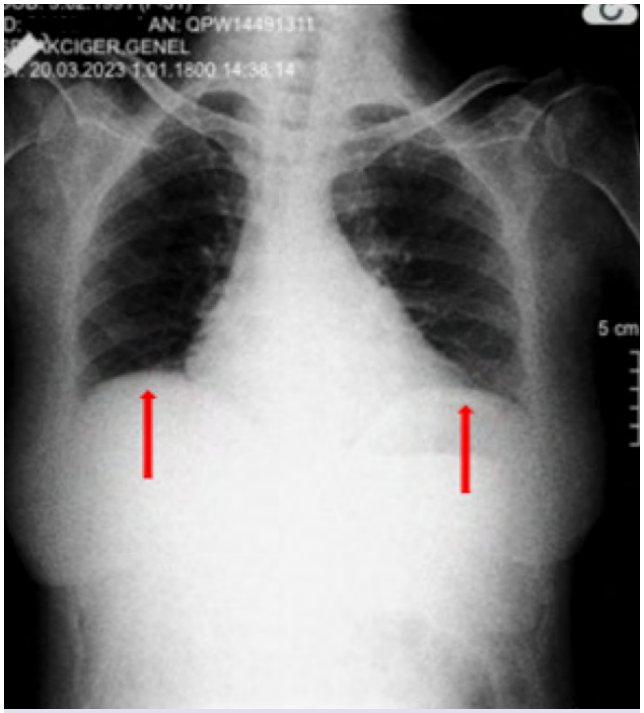

Figure 1. Posteroanterior chest X-ray. Bilateral diaphragm elevation and reduced lung volumes in lower lobes.

96%. Previous spirometry demonstrated a restrictive deficit with reduced FVC and DLCO, being 54% and 28%, respectively. Chest X-ray showed bilateral diaphragm elevation (Fig. 1).

On the day of the surgery, intravenous access was performed in the operating room, and standard monitors (ECG, pulse oximetry, and noninvasive blood pressure) were applied. The patient was sedated with 2 mg midazolam and 100 mcg fentanyl intravenously, and supplemental oxygen was administered via oxygen mask. With the patient in the supine position, the linear transducer of the ultrasound device (4–12 Hz) was positioned to identify the femoral nerve, artery, vein, and surrounding tissues in the femoral crease (Fig. 2). The needle was inserted in-plane and advanced towards the femoral nerve to obtain quadriceps muscle contractions with a current output of 1 mA. When patellar twitches attenuated between 0.3 and 0.5 mA, femoral nerve block was performed by injecting 5 ml of 2% lidocaine and 10 ml of 0.5% bupivacaine. With the patient in the lateral decubitus position, the sciatic nerve and surrounding structures were identified using a curvilinear probe (2–5 Hz) in a transverse plane over the subgluteal region (Fig. 3). The needle was inserted in-plane and advanced towards the sciatic nerve until hamstring twitches were obtained at 1 mA. When the twitches disappeared

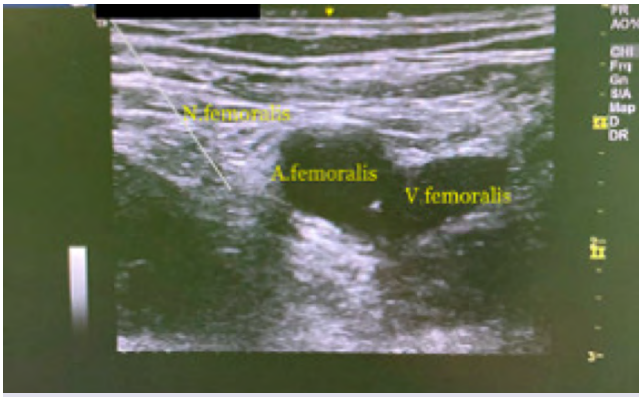

Figure 2. Ultrasound image of femoral nerve and surrounding structures.

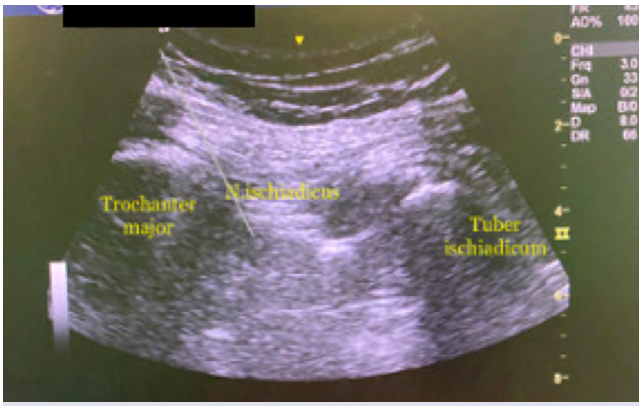

Figure 3. Ultrasound image of the sciatic nerve and surrounding tissues.

between 0.3 and 0.5 mA, sciatic nerve block was performed by injecting 5 ml of 2% lidocaine and 10 ml of 0.5% bupivacaine. The patient kept spontaneously breathing and remained hemodynamically stable throughout the procedure, which lasted 75 minutes. At the end of the surgery, the patient was admitted to PACU and transferred to her ward.

Discussion

The pathophysiology of SLS is still not known, and various theories have been suggested to explain this syndrome.[2] Some authors suggest that diaphragmatic myopathy plays a role in the pathophysiology of SLS. Although no accurate cause has yet been found, most authors suggest that SLS is caused by multiple pathological processes. These pathological processes include decreased diaphragm thickness, pleural adhesions, pleural inflammation, phrenic nerve palsy, and muscle inflammation.[3]

In the only case report of anesthesia management of a patient with SLS, thoracic epidural anesthesia was preferred for incisional hernia repair.[4] Our patient

had restrictive lung disease, and bilateral diaphragmatic elevation was present in the chest X-ray. In order to protect our patient from postoperative pulmonary complications, we did not prefer to apply general anesthesia for this surgery. Instead, we planned to perform a peripheral nerve block for unilateral knee septic arthritis debridement while preserving the spontaneous breathing of the patient. We protected our patient from both prolonged mechanical ventilation and pulmonary complications by performing femoral and sciatic nerve block for this operation.

Conclusion

In our experience, peripheral nerve blocks may enhance safety and recovery in patients at increased respiratory risk.

Ethics Committee Approval: This is a single case report, and therefore ethics committee approval was not required in accordance with institutional policies.

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

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