



CASE REPORT

Anesthesia Management in a Rare Case of Closed Subtalar Dislocation with Posterior Process Talus Fracture: A Case Report and Review of Literature

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Received date: July 4, 2020; **Accepted date:** November 8, 2020; **Published date:** December 31, 2020

Abstract

Isolated closed subtalar joint dislocation is a very rare injury that accounts for only 1% of all joint dislocations. Subtalar joint dislocations are usually associated with fractures of the adjacent bones such as the calcaneus, malleolus, fifth metatarsal, or talus. The management of such cases is usually done as a closed reduction under general anesthesia. The use of regional anesthesia for such injuries has not been highlighted in the literature. In this case report, a patient presented with severe subtalar joint dislocation, which was managed with regional popliteal and saphenous nerve blocks. However, the closed reduction failed, and the surgeon proceeded with open reduction and internal fixation with no perioperative adverse events.

Keywords: Subtalar; Joint dislocations; Nerve block; Regional anesthesia; Popliteal.

Introduction

There are very few cases of patients with isolated dislocation of the subtalar joint, reported in the literature. Globally, it accounts for only 1% of all joint dislocations. In the Kingdom of Bahrain, only four cases of isolated subtalar joint dislocation were reported.¹

Subtalar dislocation occurs usually as a result of a high-energy injury such as a fall from a height or motor vehicle accident and is mostly associated with severe pain, deformity, and swelling of the affected ankle.² It needs urgent treatment to avoid further discomfort to the patient.

Monitored sedation and general anesthesia have been used for years to manage the closed reduction

of joint dislocations. The case reported here was managed with regional anesthesia to avoid the side effects of general anesthesia.

The foot receives nerve supply from five nerves. Generally, the medial aspect receives nerve supply from the saphenous nerve, a terminal branch of the femoral nerve. The rest of the foot receives nerve supply from sciatic nerve branches as follows:

- The sural nerve which innervates the lateral aspect, arises from the tibial nerve and communicates with the superficial peroneal branches.
- The posterior tibial nerve which innervates the deep ventral aspect, muscles, and sole, originates from the tibial branch.

- The superficial peroneal nerve which innervates the dorsum of the foot comes from the common peroneal branch.
- The deep peroneal nerve innervates the deep dorsal structures and the space between the first and second toes.³

Nerve blocks provide anesthesia or analgesia for fractures and soft tissue injuries with prolonged postoperative analgesia and decrease opioid consumption. The advantage of regional anesthesia over general anesthesia is that it reduces opioid consumption in the postoperative period following ankle fracture surgery. The addition of a peripheral nerve block has a positive effect and decreases the postoperative pain.^{4,5}

Case Presentation

A 34-year-old male, with no documented alerts, allergies, or active problems, class I as per the American Society of Anesthesia classification⁶ presented with right medial subtalar joint dislocation that was further complicated with a 180-degree rotation of the talus and comminuted fracture of the posterior process of the talus (Figure 1).

The right ankle was deformed, swollen, everted, and in medial plantar flexion position (Figure 2).

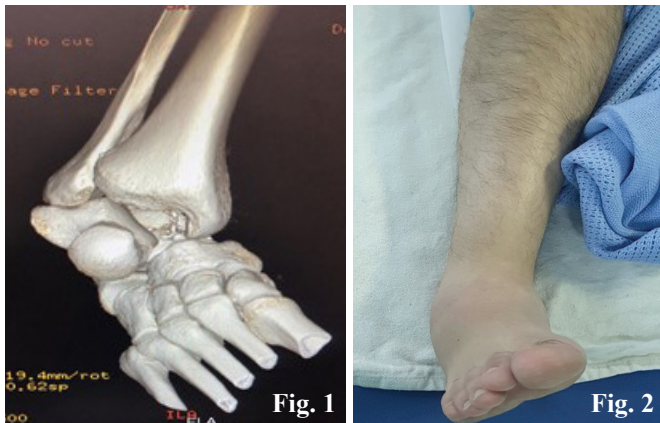


Figure 1: Computed tomography scan with 3D reconstruction image of the patient's ankle joint demonstrating the dislocation of the talo-calcaneal joint.

Figure 2: Clinical photograph showing the right Calcaneus and the rest foot is displaced and the foot is swollen and everted.

The patient was taken to the operating room for a trial of closed reduction or open reduction and internal fixation under anesthesia.

The anesthesia plan and benefits of regional anesthesia were explained to the patient and informed consent was obtained. After positioning the patient on the operating table, standard American Society of Anesthesia guidelines for monitoring were followed such as electrocardiography, non-invasive blood pressure monitoring, and pulse oximetry. The patient was given 2 mg midazolam and 100 mcg fentanyl intravenously for sedation.

An ultrasound-guided popliteal nerve block was achieved with the patient in the left lateral position, flexed knee and hip joints (Figure 3). Also, an ultrasound-guided saphenous nerve block was done with the patient in the supine position, knee joint flexed and hip joint externally rotated (Figure 4).



Figure 3: Ultrasound-guided popliteal nerve block with the patient in the left lateral position, flexed knee and hip joints.

Figure 4: Ultrasound-guided saphenous nerve block with the patient in the supine position, knee joint flexed and hip joint externally rotated.

After preparing the skin with chlorhexidine, a high-frequency linear probe with an out-of-plane short-axis view was used to identify the nerves. The skin and subcutaneous tissue were infiltrated with 3 mL of 1% lignocaine. We used 21-gauge (Stimuplex Ultra) needles to infiltrate 20 mL of 0.5% bupivacaine and 2% lignocaine, mixed in equal volumes of 10 mL each, around each nerve with satisfactory distribution under direct vision. The sensory blockade was assessed after 15 min. Ice was applied on areas supplied by both nerves for complete relief from pain. The surgery took 2 h and was very smooth, with no adverse events. The recovery was also smooth with no complications. The patient was discharged after 24 h, satisfied, with no complaints of pain.

Discussion

Subtalar joint dislocation is a very rare type of injury accounting for only about 1% of all joint dislocations.²

One of the most important benefits of regional anesthesia over general anesthesia is that it provides better patient safety and outcome as it reduces the use of analgesics and sedatives and their potential side effects. Also, patients have reported better mental awareness, ambulation, and ability to eat without feeling nauseated, and a longer duration of analgesia.⁵

Most of the cases reported in the literature were managed with closed reduction. However, in cases which are non-reducible by closed procedure; it is recommended to proceed with open reduction and internal fixation under general anesthesia and a short leg cast immobilization for 4-6 weeks.⁷

Optimal management begins with a full assessment of the patient and formulating the anesthesia plan. The strategy for patient care in the perioperative period should be tailored according to the individual and the surgical procedure involved. The role of regional anesthesia in the perioperative period has acquired more importance in the recent times than it had in the past and will be expected to become stronger in the coming years.⁸

Many efficacious, ultrasound-guided nerve block techniques can be used to provide excellent surgical conditions and a low incidence of perioperative complications.⁹

Generally, regardless of their pain profile, most of the patients show satisfaction and preference for peripheral nerve blocks over other anesthetic modalities. Effective regional nerve blocks provide adequate analgesia for short procedures, as described in our case report above.¹⁰

Ultrasound-guided nerve block techniques are well suited for the management of postoperative pain after ankle and foot surgeries. To deliver safe and efficient anesthesia, selection of a regional anesthetic should be based on the location, type, and duration of surgery, ambulation required, and the need for postoperative pain control.¹¹

Good anatomical knowledge is key for the success of peripheral nerve blocks. The sciatic nerve terminal branches – tibial and common peroneal nerves – supply the leg and foot along with the terminal branch of the femoral nerve (sensory saphenous nerve), which provides sensation to the medial aspect of the leg and foot. Popliteal and adductor canal nerve blocks provide adequate anesthesia for surgeries below the knee.¹²

One of the most important predictors of persistent postoperative pain is the extent of pain relief in the immediate postoperative period. It has been reported that adequate postoperative pain management is essential to prevent the development of chronic pain. Nerve blocks are well known to reduce the duration of hospital stay and perioperative medical complications by improving postoperative pain control.^{13,14}

One of the most beneficial values of the adductor canal saphenous nerve block is that it does not affect the motor function of the quadriceps muscles or the balance, and provides non-inferior postoperative analgesia compared to a femoral nerve block.¹⁵

Conclusion

Ultrasound-guided combined popliteal sciatic and adductor canal nerve block is an effective alternative anesthetic technique, compared to general anesthesia, for surgeries below the knee with observed patient satisfaction, excellent pain management in the perioperative period, lower incidence of chronic pain, early manipulation, reduction in the length of hospital stay, dramatic decrease in the total hospitalization cost to the patient, and most importantly avoiding general anesthesia-related adverse effects.

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