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Covid-19 and Regional Anaesthesia: Use of Ultrasound guided Popliteal Sciatic Nerve Blocks for Emergency Forefoot Amputation in a High Risk Deaf and Mute Covid-19 Contact Patient

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Abstract

Introduction: COVID-19 has brought in the foreground the benefits of regional anaesthetic techniques as the preferred method of anaesthesia when possible. While there are many case reports of peripheral nerve blocks successfully used during the pandemic, to our knowledge this is the first case report of the use of regional anaesthesia for peripheral limb surgery for high risk deaf and mute COVID-19 contact patient and challenges one encounters in patients with this disability.

Case Presentation: A 65-year-old man presented as an emergency with critical left lower limb ischaemia. Initially a left common femoral and profunda femoris endarterectomy were performed under general anaesthesia that led to unplanned admission to the HDU for vasopressor support due to persistent hypotension. Following the initial procedure, his symptoms failed to improve, with ongoing forefoot pain and signs of infection. The decision was made to proceed to a forefoot debridement that was successfully performed under peripheral nerve block and patient discharged back to the ward without any peri-op complications.

Conclusion: In this case report we describe the use of regional techniques to facilitate the emergency procedure with a view to minimising risk to the patient with a previous history of requiring prolonged vasopressor support and unplanned HDU admission after general anaesthesia. His status as a COVID-19 bay contact and as a high risk deaf and mute patient where communication is an issue make this an interesting case.

Keywords: COVID-19; Regional anaesthesia; Forefoot amputation; Contact positive; Deaf and mute.

Introduction

The COVID-19 pandemic has changed the way we provide anaesthesia for our patients, undergoing both emergency and elective surgery. While regional anaesthetic techniques have been gaining popularity over the last few years, they have been mostly used as an analgesic adjunct. Within few months into the pandemic, both the American Society of Regional Anaesthesia (ASRA) and the European Society of Regional Anaesthesia and Pain Therapy (ESRAPT) published practice recommendations regarding the benefits of using regional anaesthesia as first line in patients with COVID-19 [1]. These guidelines were soon followed by similar recommendation from the Royal College of Anaesthetists and the Association of Anaesthetists of Great Britain and Ireland [2], citing the advantage of regional anaesthesia in not being an aerosol generating procedure as compared to general anaesthesia with endotracheal intubation and hence it's safety.

Patients with peripheral vascular disease fall within the high risk category for severe complications of COVID-19, due to their frequent and multiple comorbidities. Most of these patients have cardio-respiratory co-morbidities due to smoking that puts them in the high risk group for COVID related post-op morbidity and mortality. In this case report, we describe the use of an ultrasound guided popliteal and sciatic nerve block in a deaf and mute patient who though himself been COVID negative, was in a four bedded bay with a confirmed COVID positive case. He required an emergency forefoot amputation and had been on the emergency list for 48 hrs. We will also describe our plan to be able to communicate with the patient for the duration of the operation in the absence of his British Sign Language (BSL) interpreter who could not be allowed in the operation theatres as per the department policy.

Case report

A 65-year-old man was transferred from another hospital as an emergency to our vascular unit. He initially presented to the vascular clinic with symptoms of critical limb ischaemia, manifesting as rest pain and associated skin changes. He had a significant medical history of peripheral vascular disease

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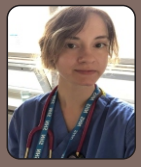

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(including a previous right lower limb bypass, complicated by an unplanned High Dependency Unit admission for Type 1 respiratory failure post-operatively), ischaemic heart disease with unstable angina, suspected TIA, hypertension and chronic pancreatitis. He was also a lifelong smoker, with a likely element of undiagnosed COPD. As he was deaf and mute, he was only able to communicate through lip reading or by using a BSL interpreter.

Following his admission to our hospital, he was treated with antibiotics for nine days, while his procedure was planned. On day ten of his admission, he underwent a left common femoral and profunda femoris endarterectomy under general anaesthetic. Intraoperatively he required frequent boluses of metaraminol to maintain his blood pressure. In the immediate post operative period, he remained hypotensive and had to be started on a vasopressor infusion (metaraminol). This significantly prolonged his recovery and he had to remain in our recovery area overnight. On the following day, he was still hypotensive, requiring metaraminol to maintain a MAP > 75 and hence he was referred to HDU and later admitted there. Over the next few days he was slowly weaned off the vasopressor infusion and was stepped down to the ward.

Following the initial revascularisation surgery, his symptoms did not improve. His left forefoot remained painful and ischemic, with progressive skin changes and increasing inflammatory markers, the decision to proceed with a forefoot amputation was made. Due to pressures in the emergency theatre, there was a delay of 48 hrs between the time the decision was made to return to theatre, and the actual operation. During this 48 hrs wait, one of the other patients in the bay where he was admitted, tested positive for COVID-19. It is the hospital policy that bay contact patients are treated as COVID-19 positive even if they themselves have tested negative on two occasions.

Because of his previous two unplanned admissions to HDU following a general anaesthetic (both with respiratory and cardiovascular complications), and his current status of COVID-19 contact, we felt that the best option for him would be to have his operation performed under regional anaesthesia (popliteal and sciatic nerve blocks). The risks and benefits were discussed with the patient with a BSL interpreter present, and he was happy with the plan.

On his arrival to the anaesthetic room the BSL interpreter accompanied the patient, so that the consent can be confirmed for the procedure and the nerve blocks. The method of communication in the absence of the interpreter were discussed and the plan explained. Common signs that can be used were noted i.e for pain on incision and everything is fine. It was also decided that a pen and paper will be available if the patient wanted to communicate anything else. The patient wanted to carry his tablet to the theatre but on discussion with the theatre managers, it was decided that the policy does not allow patients to carry their own mobiles and tablets into the operation theatres. Patient was disappointed but understood the reasons and agreed with our plan of action. After all the checks, IV access was secured, and routine monitoring was instituted. The area for the block was sterilised with chlorhexidine. The leg was placed in a stable position for the block with the help of an assistance. Using ultrasound (transducer L38/10-5 MHz linear array, M-Turbo, FUJIFILM SonoSite, Bothell, USA), the sciatic nerve was located above the apex of the popliteal fossa at a point where both the tibial and common peroneal nerve are surrounded by common paraneural sheath. To ensure safe aseptic conditions, nerve blocks was conducted according to standard operating procedures. The puncture site was disinfected with alcoholic chlorhexidine. The probe was covered with a sterile sheath. Under ultrasound guidance, a 19 G, 100 mm sonoplex block needle was directed to the sciatic nerve and once the common paraneural sheath was pierced, 20 mls of 0.375% Levobupivicaine was injected after negative aspiration until the entire circumference of the nerve was shown to be surrounded by the local anaesthetic. A distal scan was done to ensure the local anaesthetic had spread along both the branches of the sciatic nerve.

The saphenous nerve was blocked above the ankle under US guidance by depositing local anaesthetic (0.25% Levobupivicaine 10 mls) around the saphenous vein.

The patient tolerated the procedure very well. He remained haemodynamically stable throughout the procedure; no vasopressors were required to support his blood pressure. He maintained oxygen saturation of 96-97% without any oxygen supplementation. Following the procedure, the patient was directly transferred to the ward, bypassing the recovery room. The patient was followed up for the next three days post operatively, the patient remained on the vascular ward and had not required any further critical care or HDU input or admission.

Discussion

During the COVID-19 times, it is prudent to choose the most appropriate anaesthetic technique, considering the safety of both the patients and the healthcare workers. Endotracheal intubation for conducting general anaesthesia and invasive ventilation can exacerbate the course of COVID-19 pneumonia. Furthermore, the act of manipulating the airway of such a patient also poses risks to the anaesthetist and other staff present in the anaesthesia room through aerosol generation. Though there is paucity of literature on the long term effects of regional anaesthesia in COVID-19 patients, it would be seem reasonable and logical to use techniques that do not generate aerosol preferentially, whenever possible [3,4].

There are also logistical benefits of avoiding aerosol generating procedures in confirmed or suspected COVID-19 patients. Infection control requirements are different when no such procedures are performed, and on a busy list with multiple patients this can make the difference between someone having their operation or not. The recovery times are shortened, the analgesia is profound and the complication like post-op nausea and vomiting (PONV) and post-op sore throat (POST) are avoided. This allows for quicker turn around times and efficient utilisation of theatre space.

In the case of our patient, choosing a regional technique was complicated by difficulties in communication. The success of operations under peripheral nerve blocks depends, to an extent, on the ability of the patient and the anaesthetist to be able to communicate effectively, so the safety and comfort of the former is ensured. By planning ahead and agreeing on certain signals that he could use during the procedure, we developed a rapport with the patient, decreased his anxiety about not being able to be understood during the procedure and established a clear plan in case the block was not successful.

Aim of regional anaesthesia in COVID times is to successfully establish nerve blocks without having to use sedation or convert it to general anaesthesia. This is only possible when the nerve blocks are performed by those who have proficiency in regional anaesthesia. Both ESRA, ASRA and the Royal College of Anaesthetist recommend

use of block teams comprising of anaesthetists with proficiency in regional anaesthesia during COVID times in patients where surgery can be performed purely regional techniques. Regional anaesthesia should be considered as first option in cases where it is possible to conduct surgeries under nerve blocks or neuraxial anaesthesia, it should become the norm rather than exception [5].

Conclusion

Regional anaesthesia, including peripheral nerve blocks, are an important tool in an anaesthetist's armamentarium. This is increasingly true in the light of a respiratory virus pandemic. With this case we have demonstrated how using a regional technique can improve patient outcomes as well as improve the safety of the healthcare personnel involved. Careful planning and communication ensured the success of the procedure and a good outcome for our patient. Moving forward, and as our collective experience with regional techniques increases, it is reasonable to expect that the recommendations to prefer those over general anaesthesia when feasible will persist.

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