Painless Dorsalis Pedis Arterial Cannulation in a Patient Undergoing awake Craniotomy

Siddharth Chakraborty[1], Surjyendu Ghosh[2], Aniruddha Banerjee[3], Kantha Manasa[4]

ABSTRACT

Introduction: Intra-arterial cannulation enables real time blood pressure monitoring, assessment of dynamic fluid status, and frequent blood sampling in the intraoperative period as well as in the intensive care unit (ICU). An arterial line is usually established after the anaesthesia induction during most of the perioperative procedures. In some instances, an arterial cannulation needs to be established in patients while in awake state. In these patients' painless arterial cannulation is needed to prevent sympathetic response and its sequelae like vasospasm.

Case report: Here we present a case, posted for awake craniotomy with traumatic left forearm amputation in the emergency operation room (OR). To avoid cannulation related complications in the only available right forearm, we decided to put DPA cannulation. Once we achieved adequate block by combined application of the superficial peroneal nerve (SPN) and the deep peroneal nerve (DPN) block, a 20G arterial cannula was inserted without any pain response and any significant hemodynamic changes.

Conclusion: We propose a combined application of the SPN and the DPN block for painless dorsalis pedis artery (DPA) cannulation in an awake patient. The DPA cannulation under regional block (RB) will lower the likelihood of vasospasm and hence can be practiced in patients at risk of lower limb ischemia.

Keywords: Painless Arterial Cannulation; Dorsalis Pedis Artery; Superficial and Deep Peroneal Nerve Block; Awake Craniotomy.

INTRODUCTION

Intra-arterial cannulation enables real time blood pressure monitoring, assessment of dynamic fluid status, and frequent blood sampling in the intraoperative period as well as in the intensive care unit (ICU). Multiple sites, including radial, posterior tibial, femoral, brachial, axillary, ulnar and, dorsalis pedis arteries are available for arterial cannulation.[1]

An arterial line is usually established after the anaesthesia induction during most of the perioperative procedures. In some instances, an arterial cannulation needs to be established in patients while in awake state, example- interventional neuro-radiological procedures like balloon occlusion test, ICU patients require repeated blood gas analysis & patients with cardiac disease undergoing surgery under regional anaesthesia. In these patients' painless arterial cannulation is needed to prevent sympathetic response and its sequelae like vasospasm. After the radial artery (RA), dorsalis pedis artery (DPA) is widely regarded as the next best choice due to an excellent collateral flow, less chance of complications and easy to cannulate. To perform an awake painless arterial cannulation, regional block (RB) is the best option. The use of radial nerve block (RNB) for painless RA cannulation has already been documented in the literature. However, difficult landmark makes ultrasound (USG) necessary for successful RNB.[1] So, blind RNB administration is difficult in scant resources setting, where USG is not available.

CASE REPORT

Here we are presenting a case, posted for awake craniotomy with traumatic left forearm amputation in the emergency operation room (OR). To avoid cannulation related complications in the only available right forearm, we decided to put DPA cannulation. For a painless DPA cannulation, a SPN block is achieved by injecting 5-7 ml of local anaesthetic (LA) in a subcutaneous ring pattern between the extensor hallucis longus (EHL) tendon and the lateral malleolus**.** For the midtarsal approach of the DPN block, the EHL tendon is identified first by asking the patient to dorsiflex the great toe, then locate the pulse of the dorsalis pedis artery on the planter surface of the foot. A 1.5-inch, 25-gauge needle is inserted 2 cm distal from the intermalleolar line, immediately lateral to the EHL tendon and medial to the artery, and after negative aspiration, 5 mL of LA is injected. With the exception of the first web space, which is supplied by the DPN, the whole dorsum of the foot is supplied by the SPN. Once we achieved adequate block, a 20G arterial cannula was inserted without any pain response and any significant hemodynamic changes. There is a paucity of literature regarding lower limb arterial cannulation. We propose a combined application of the superficial peroneal nerve (SPN) and the deep peroneal nerve (DPN) block for painless DPA cannulation in an awake patient. Hence, the combined block of these two nerves

[1]Senior Resident Doctor, Department of Anaesthesia, All India Institute of Medical Sciences, Rishikesh, [2]Senior Resident Doctor, Department of Onco-anaesthesia and Palliative Care Medicine, All India Institute of Medical Sciences, New Delhi, [3]Resident Doctor, Department of Anaesthesia, All India Institute of Medical Sciences, Rishikesh, [4]Resident Doctor, Department of Anaesthesia, AIIMS Rishikesh, India.

Corresponding author: Dr Surjyendu Ghosh, All India Institute of Medical Sciences (AIIMS), New Delhi, Pincode – 110029, India

How to cite this article: Chakraborty S, Ghosh S, Banerjee A, Manasa K. Painless dorsalis pedis arterial cannulation in a patient undergoing awake craniotomy. International Journal of Contemporary Medical Research 2021;8(8):H6-H7.

DOI: http://dx.doi.org/10.21276/ijcmr.2021.8.8.16

anaesthetises the area around the DPA, facilitating painless cannulation in an awake patient. Although USG usage is preferred to increase the success rate, but these blocks can be administered blindly due to easy to locate prominent landmarks. Anand et al. found that, use of USG for the DPA cannulation is not associated with a significant increase in first-attempt success rate, decrease in total number of cannulation attempts, or total procedure time and DPA cannulation is less USG dependent.[2,3]

In an awake patient with resource-limited settings, the DPA cannulation combined with the SPN and DPN block is more feasible. In conclusion, the DPA cannulation under RB will lower the likelihood of vasospasm and hence can be practiced in patients at risk of lower limb ischemia.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 03-07-2021; **Accepted:** 12-08-2021; **Published:** 30-08-2021