Practical considerations for performing brachial plexus blocks in suspected COVID-19 patients

To the Editor,

Performing ultrasound (US)-guided blocks of upper limb, i.e., brachial plexus blocks (BPB), in COVID-19 patients or suspected patients imposes unique challenges. We describe our experience of US-guided BBB via various approaches in 22 suspected COVID19 patients who sustained upper limb fractures [Table 1]. Details of demographic profile and types of block are shown in Table 2. A brief pre-anesthesia checkup was performed by wearing N95 mask and as per advisory of Indian Society of Anesthesiologists (ISA National).

Relevant medical comorbidities, allergies, and fasting status were questioned. Consent was taken as per institutional protocol. Blood samples for relevant tests (complete blood picture, viral markers, creatinine, and coagulation studies) were collected in a laboratory by personnel wearing cap, masks, and sterile gloves. All patients were shifted to radiology suite for a high-resolution computed tomography scan for COVID19 screening as per institutional protocol and thereafter to the operating room (OR) with three-layered face masks. Essential monitors (electrocardiograph with leads II and V2, noninvasive blood pressure, and pulse oximeter) were attached once cleared for planned surgery. As per current evidence, all health care personnel involved used protection like three-layered face mask, caps, and gloves as necessary. After securing appropriate intravenous access, patients face was covered with a transparent sheet and head turned to opposite side of surgery after ascertaining that the cervical spine was not compromised. Blocks were performed by donning appropriate personnel protection equipment (PPE). Local anesthetic (LA) was freshly prepared in a 20-mL syringe with 30-µg clonidine and placed in a plastic bag with stimulating needles to be utilized.

As regional anesthesia (RA) does not involve airway intervention, there is less possibility of exposure to aerosol provided the patient is spontaneously breathing with the face turned to the opposite side of block. Conventionally the US machine is placed on the opposite side of the side of block. The purpose of ideal ergonomics is to avoid inappropriate posture or position of the hands, wrists, neck, trunk, and shoulders, thereby causing strain to performer. In this series, interscalene, supraclavicular, and infraclavicular blocks were performed by keeping the US machine on the same side of block which is against the usual ergonomics Figure 1a and b. Axillary fossa block was performed in three patients along with a rescue block (radial nerve block) in one patient with standard ergonomics. Our patients were on low flow oxygen supplementation via face mask at less than 4 L/min with a three-layered mask over the oxygen mask. The purpose was to avoid exposure to possible aerosol generated by the patient considering the suspicion of COVID19 as the US machine

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Table 1: Clinical picture of 22 patients

| Clinical Picture                  | n=22 |
|----------------------------------|------|
| Cough with fever                 | 8    |
| Breathlessness                   | 6    |
| Sore throat                      | 7    |
| Ground-glass opacity on CT       | 1    |

Table 2: Demography details with type of blocks administered

| Total cases                      | 22   |
|----------------------------------|------|
| ASA-PS I/II/III                  | 8/12/02 |
| Male/Female                      | 17/05 |

Brachial Plexus Block (n=22)

| Block Type                        | n     |
|-----------------------------------|-------|
| Interscalene (ICB)                | 3     |
| Continuous incremental ICB        | 2     |
| Supraclavicular                   | 7     |
| Infraclavicular                   | 5     |
| Costoclavicular                   | 2     |
| Axillary fossa block              | 3     |

Figure 1: (a) Right infraclavicular block under ultrasound guidance. The machine is on the same side against the conventional ergonomics. (b) Right interscalene block under ultrasound guidance. The machine is on the same side against the conventional ergonomics. (c) The keyboard of ultrasound machine is covered with disposable green sheet. (d) The probe cable and the peripheral nerve stimulator is also covered with disposable green sheet.
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has a large exposed area susceptible to contamination with aerosol. All blocks were performed by covering the US probe with sterile biofilm (Tegaderm™) and the machine with keypads and probe cables (except the screen) covered with green disposable, transparent sheet [Figure 1c and d]. Of the 22 blocks, two blocks needed a rescue strategy one in the form of 10-mL supraclavicular corner pocket injection and one a radial nerve block through the axillary approach [Table 3]. Fogging of goggles worn as a part of PPE also impaired the vision of the block performer. This was overcome by shifting the head end of OR table below the vertical laminar flow. This prevented fogging and provided clear vision throughout the block performance. We ensured that in case the block fails and general anesthesia (GA) is inevitable with an endotracheal tube, appropriate PPE was kept ready in the OR. GA was not required for any of the patients. Aerosol viral transmission is a major hazard in suspected COVID patients. Since GA will accelerate and increase viral load, nonaerosolized anesthesia is mandatory to decrease risk of infection to the anesthesiologists and theater staff. RA could be considered as nonaerosolized anesthesia technique provided the block is successful. Since dispersal distance increases with increased oxygen flow rates, standing close to the patient during administration of BPB can lead to lateral stream ejection from patient as far as 0.2 to 0.22 m with 4 to 6 L/min of oxygen through the facemask. In case high flows are necessary, a three-layered mask applied over the oxygen mask is recommended.

Although ergonomics is important, in such situations to avoid exposure of OR personnel to aerosol and to prevent contamination of US machine, it is suggested to deviate from the standard practice for safety sake. Poor ergonomics might increase the time of block performance but it is suggested to identify structures of importance and administer appropriate quantity of LA so that a successful block is achieved. In case of a patchy block, rescue blocks could be administered so as to avoid a GA in a suspected or a COVID19 positive patient.

**Declaration of patient consent**
The authors certify that they have obtained appropriate patient consent. In the form, the patients have given their consent for using images and other clinical information to be reported in the journal. The patients understand that names and initials will not be published and due efforts will be made to conceal their identity.

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**Conflicts of interest**
There are no conflicts of interest.

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**References**

1. Lie SA, Wong SW, Wong LT, Wong TGL, Chong SY. Practical considerations for performing regional anaesthesia: Lessons learned from the COVID-19 pandemic. Can J Anaesth 2020;67:885-92.
2. Malhotra N, Joshi M, Datta R, Bajwa SJS, Mehdiratta L. Indian society of anaesthesiologists (ISA National) advisory and position statement regarding COVID-19. Indian J Anaesth 2020;64:259-63.
3. Bahl P, Doolan C, de Silva C, Chughtai AA, Bourouiba L, MacIntyre CR. Airborne or droplet precautions for health workers treating COVID-19? J Infect Dis 2020. doi: 10.1093/infdis/jiaa189.
4. Cook TM. Personal protective equipment during the coronavirus disease (COVID) 2019 pandemic-a narrative review. Anaesthesia 2020;75:920-7.
5. Raghavendra Rao RS. Ergonomical aspects of anaesthetic practice. Indian J Anaesth 2016;60:306-11.
6. Wilson NM, Norton A, Young FP, Collins DW. Airborne transmission of severe acute respiratory syndrome coronavirus-2 to healthcare workers: A narrative review. Anaesthesia 2020. doi: 10.1111/anae.

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**Table 3: Management strategy of patchy blocks**

| Failed block       | Rescue block                                                                 |
|--------------------|-----------------------------------------------------------------------------|
| Infraclavicular    | Corner pocket injection (supraclavicular) with 1% lidocaine 5 mL and 0.5% bupivacaine 5 mL |
| Supraclavicular    | Ulnar and radial nerve block in axilla (2.5 mL of 0.5% bupivacaine for each nerve) |
15093.
7. Hui DS, Hall SD, Chan MT, Chow BK, SNg Susanna, Gin T, et al. Exhaled air dispersion during oxygen delivery via a simple oxygen mask. Chest 2007;132:540-6.
8. Odor PM, Neun M, Bampoe S, Clark S, Heaton D, Hoogenboom EM, et al. Anaesthesia and COVID-19: Infection control. Br J Anaesth 2020. S0007-0912(20)30200-2. doi: 10.1016/j.bja.2020.03.025.

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