Practical Considerations for Performing Regional Anesthesia:

Lessons Learned from the COVID-19 Pandemic

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- With the rapidly increasing number of COVID-19 cases worldwide, more of these patients are expected to present for surgical intervention
- This necessitates heightened precautions and tailoring our practice to minimize aerosol-generating procedures such as bag mask ventilation, open airway suctioning, and endotracheal intubation.
- To avoid any airway manipulation, the use of regional anesthesia techniques may be preferred
- However, intraoperative conversion to GA is least desirable. If the duration or complexity of surgery means a high probability of conversion to GA, it is better to start with GA.

- The current recommendations assume that anesthesia care will be needed only on urgent and emergent surgeries or surgeries that are lifesaving (such as cancer surgeries)
- All elective surgeries should be postponed to reduce the risk of exposure to COVID-19 and to conserve the capacity of the healthcare system, personnel, and resources for a possible increase in demand.

Advantages of RA compared to GA:

- Reduced pain and opioid consumption
- Avoidance of airway instrumentation
- Avoidance of patient coughing during intubation and extubation
- Reducing the risk of infecting staff via the associated aerosol generation and dispersion of viral particles
- Fewer effects on respiratory function and dynamics
- Decreased incidence of postoperative pulmonary complications, especially in COVID-19 patients who may already have reduced respiratory function from pneumonia or ARDS

HEALTH CARE WORKERS WHO PERFORM TRACHEAL INTUBATION ARE 6 TIMES MORE LIKELY TO BECOME INFECTED

Preparation and Planning

- The first step in the planning of anesthesia for a patient during the COVID-19 pandemic is to ascertain if the patient is COVID-19 negative, COVID-19 positive, or suspected to be positive (PUI)
- If the patient is not COVID-19 positive, not suspected to be positive, or not PUI, then regional anesthesia can be provided following usual local institutional guidelines as before the pandemic.
- Once the community spread of COVID-19 is significant, all cases may be presumed to be COVID-19 positive.
- The management of COVID-19 patients will be discussed in detail in what follows

Intra-Hospital Transport

- Patients must wear a surgical face mask during transfer from the isolation ward to the OR
- The accompanying healthcare workers wear fitted N95 masks, eye protection (either goggles or full face shield), caps, gowns, and gloves
- Patients are transported along a designated route to minimize contact of other people, preferably in the presence of an infection prevention nurse to ensure compliance with infection control measures

Preoperative Assessment

- It is preferable to substitute paper-based consent with digital consent forms signed on laptops or mobile devices, which can be protected with single-use plastic wraps.
- It is preferable that the patient be seen and consent taken inside the OR where the surgery will be performed to limit contamination to a single location

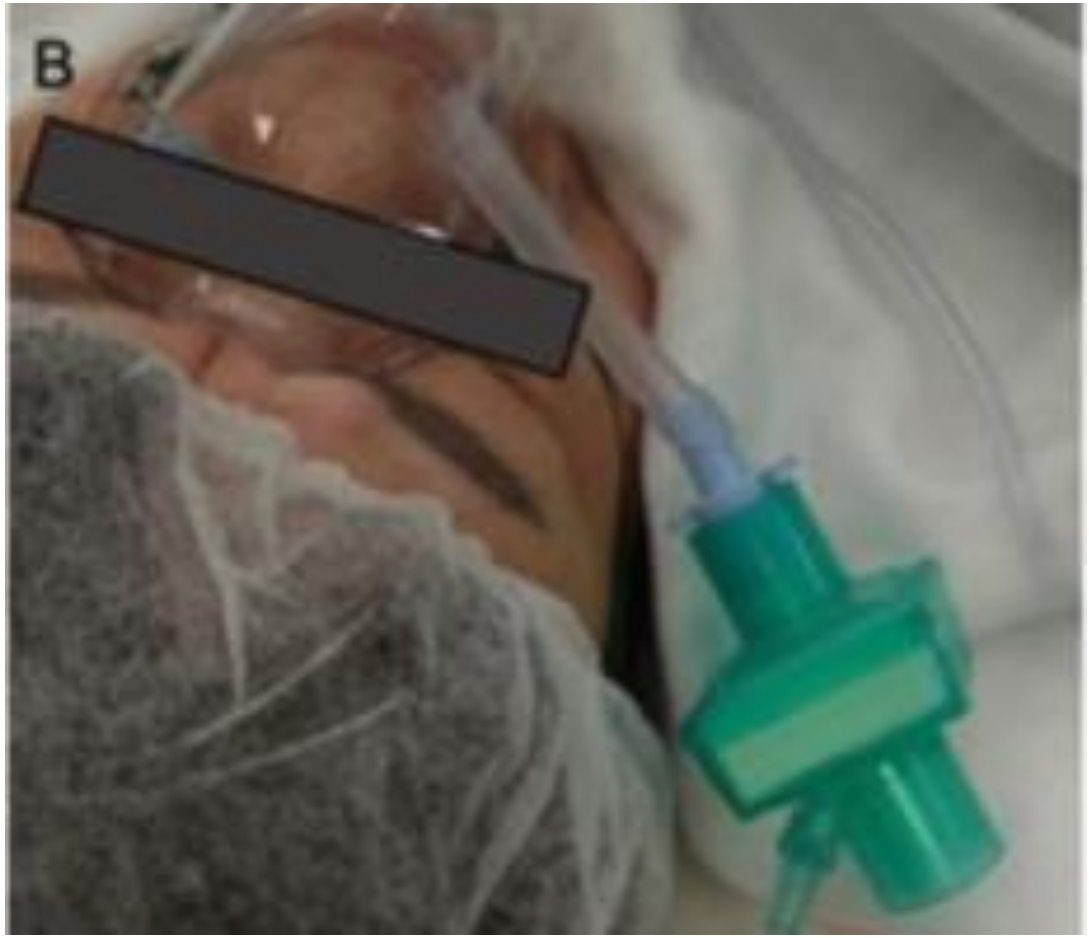
شو بحضر لل case

- Only necessary equipment and drugs should be brought into the OR to prevent contamination and wasting resources
- Additional equipment required can be obtained through a “runner”
- The ultrasound machine’s screen and controls should be protected with a single-use plastic cover.
- Probes that are not needed should be detached from the machine
- The ultrasound probe should be covered along its entire length with a disposable probe sheath.

Sedation

- Sedation should be used with caution in COVID-19 patients, as they may have co-existing respiratory compromise from pneumonia
- Supplemental oxygen can be provided either via nasal prongs under the surgical face mask or using a simple face mask
- The surgical face mask must be worn at all ties to prevent droplet transmission
- One should avoid connecting the CO2 sampling line directly to prevent contamination of the monitor

- One suggestion is to connect an ETT connector and filter either directly to the simple face mask or interposed by a cut segment of suction tubing
- Alternatively, the respiratory rate can be monitored by clinical observation or by EKG systems that use impedance plethysmography
- Oxygen flow must be kept as low as needed to maintain oxygen saturation



Personal Protective Equipment

- Operators performing RA on a COVID-19 patient should, at minimum, don PPE, goggles, and a surgical face mask
- Since RA is not an AGP, the option of donning an N95 mask is optional

Recovery of Patient

After the surgical procedure, the patient should remain in the same OR for post-anesthetic recovery to prevent contamination of other clinical areas

Decontamination of Equipment

- The plastic sheets covering the ultrasound machine should be removed and discarded in clearly labelled biohazard bins.
- The ultrasound machine should be wiped down with quaternary ammonium chloride disinfectant wipes.
- It should then be left in the OR for ultraviolet C irradiation or hydrogen peroxide vaporization before it is used on another patient.

Failed Block

- Prior to the start of surgery, the block should be tested to ensure optimal operating conditions so as to avoid urgent conversion to GA when surgery is already underway
- Should the need to convert to GA arise, the anesthesiologist should follow PPE guidelines and use an induction technique that reduces aerosol generation to the minimum
- Techniques adopted to minimize the occurrence of diaphragmatic paralysis specific to brachial plexus blocks include modifying the local anesthetic volume or injection site

Local Anesthesia Systemic Toxicity

- Management of LAST should follow currently established guidelines
- The anesthesia drug trolley containing the standard resuscitation drugs and defibrillator cart should then be pushed in for use in patient resuscitation
- A “runner” stationed outside the OR for all cases is responsible for replenishing drugs and equipment that are not found in the trolley

Spinal and Epidural Anesthesia

- The use of spinal anesthesia is not contraindicated for a COVID-19 positive or PUI
- Caution should be exercised when attempting to reduce the duration of the spinal anesthetic by using short-acting spinal anesthetics or reducing the dose of the spinal anesthetic agent to avoid conversion to GA
- It is advisable to rule out thrombocytopenia as there is preliminary evidence to suggest that it might occur in patients with severe COVID-19 disease
- As the virus has been isolated from cerebrospinal fluid (CSF) in patients who suffered from COVID-19 encephalitis, an attempt should be made to reduce contamination by not allowing the CSF to drip freely after lumbar puncture

End of Case

- The patient should be monitored in the operating room until safe and before transfer to a COVID-19-designated area of the hospital, as per local guidelines.
- It has been shown that the risk of transmission is highest during the doffing of personal protective equipment (PPE). The presence of an observer during the donning and doffing procedure is highly recommended
- Any reusable equipment utilized during the procedure should be disinfected as per institutional guidelines

Take Home Messages

USE SAFE PRACTICES

- Don appropriate PPE before doing the procedure, take extra time to doff, and use an observer.
- RA procedures are not considered aerosol-generating:
  - The use of respirator masks is generally not considered necessary for the performance of RA but may be necessary if close contact with a patient for prolonged duration is needed.
  - Use respirator masks when available, but they should definitely be considered for surgical procedures with a significant risk of conversion to GA.
- All patients should wear a surgical mask to restrict droplet spread.
- Ensure the use of plastic covers to protect ultrasound equipment.

CHOOSE THE RIGHT PROCEDURES

- The use of RA is not contraindicated for COVID-19 positive patients.
- Prepare and pack the required drugs in a plastic bag.
- Use blocks that have minimum impact on respiratory function such as axillary or infraclavicular brachial plexus block.
- Risk-benefit should be considered for perineural adjuvants and continuous perineural catheters.
- Currently, no dose adjustment for RA is recommended.
- Use ultrasound guidance for peripheral nerve blocks.

BE VIGILANT

- RA should be thoroughly tested before proceeding with surgery to minimize the need for conversion to GA.
- Use minimal supplemental oxygen - enough to maintain saturation.
- Rule out thrombocytopenia before neuraxial procedures.
- Watch and be prepared for hypotension after neuraxial anesthesia.
- Postpone epidural blood patch if possible until recovery from acute infection.

Considerations for Obstetric Anesthesia Care Related to COVID-19

Labor and Delivery

- Labor itself is not an aerosol-generating procedure
- Admit the patient to a negative pressure room (if available)
- Keep the surgical mask on the patient at ALL times
- Pre-anesthesia assessment should preferably be done over the phone or by video call
- Prior to entering labor and delivery room, all healthcare workers should implement droplet and contact precautions with eye protection (gown, gloves, mask, face shield).

Neuraxial Block Placement

- A COVID19 diagnosis itself is NOT a contraindication for neuraxial analgesia/ anesthesia.
- Encourage early neuraxial labor analgesia as it may reduce the need for general anesthesia for emergent cesarean delivery.
- Check the platelet count before insertion of epidural or spinal, and possibly before removal of the epidural catheter, as thrombocytopenia is common in these patients. An acceptable range is 80-100 thousand.
- The most experienced provider should preferably perform the block
- Airborne precautions should be taken in addition to droplet/contact precautions whenever the patient is confirmed COVID-19 +

Cesarean Delivery

- The route to and from the delivery room should be cleared by security
- Avoid general anesthesia unless absolutely necessary
- Regardless of the type of anesthesia, anesthesia providers and assistants should implement droplet and contact precautions with eye protection.
- A runner should be identified and stationed outside the OR to provide additional help/supplies

If GA is indicated:

- Minimize the people in the room at the time of intubation to only essential personnel, all of whom should wear N95 masks
- Double gloves should be used, the outer layer of which should be discarded immediately after intubation
- Pre-oxygenation should occur with a circuit extension and HEPA filter
- Use a closed suction system (if available)
- RSI should be done using video-laryngoscope to maximize first-attempt success
- Extubation should be done to nasal cannula or face mask with low flow, with the surgical mask on the patient at all times

- It is unclear whether or not NSAIDs should be avoided in patients with suspected or confirmed COVID
- Avoid using dexamethasone for PONV prophylaxis in COVID positive patients due to the potential risks of steroids
- Anti-emetics should be administered routinely to prevent vomiting

DURING LABOR & DELIVERY

(for suspected or confirmed COVID-19+)

Admit patient to negative pressure room, if available

Surgical mask for patient at ALL TIMES

PPE for direct patient care (Gloves, Gown, Mask, Face shield)

Pre-anesthesia assessment via phone/video

Video-assisted electronic multidisciplinary discussions

Encourage early neuraxial labor analgesia

Minimize crash cesareans

Response time will be delayed

DURING NEURAXIAL PLACEMENT

(for suspected or confirmed COVID-19+)

COVID-19 in itself

NOT a contraindication for

neuraxial analgesia/anesthesia

Experienced provider

PPE

DROPLET/CONTACT PRECAUTION

(Gloves, gown, face-shield, mask)

If confirmed COVID-19+, AIRBORNE PRECAUTION

(N95 or PAPR)

DURING CESAREAN DELIVERY

(for suspected or confirmed COVID-19+)

Activate back-up coverage for L&D

Identify a runner, to be stationed outside OR, who will provide help/supplies

Minimize number of staff per case

Anesthesia providers and assistants should implement DROPLET/CONTACT PRECAUTION

If confirmed COVID-19+, AIRBORNE PRECAUTION (N95 or PAPR)

Use donning/doffing checklists under direct observation

DURING INDUCTION & MAINTENANCE OF GENERAL ANESTHESIA

(for suspected or confirmed COVID-19+)

Minimize personnel in OR for

induction – only essential staff

PPE for personnel within 6 feet

During intubation/extubation

AIRBORNE PROTECTION

(Gloves, gown, N95 with face shield

or PAPR)

Ensure HEPA filter between patient and anesthesia circuit

Pre-oxygenation: 100% O_2

RSI

Avoid positive pressure bag-mask ventilation

Use video-laryngoscopy

Extubation in the OR to nasal cannula or O_2 mask with low flow

Maintain surgical mask on patient

Thank You!