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Guidelines on Surgery for Fragility Hip Fractures During the COVID-19 Pandemic

Philippine Hip & Knee Society and Philippine Orthopaedic Trauma Society

During these times of uncertainty, the Philippine Hip and Knee Society and the Philippine Orthopaedic Trauma Society present these guidelines on the management of fragility hip fractures to its members and to the fellows of the Philippine Orthopaedic Association.

These are strategies developed by the two societies based on a consensus arrived at after deliberation and review of the latest reports on COVID-19 virus. Needless to say, it us up to the treating surgeon whether our recommendations are to be followed strictly or if they are to be modified depending on several factors such as availabiility of resources, availability of personnel, and the prevailing directives in the regional and local area where the treating physician practices.

A. Definition of Terms

1. Emergent Cases
   a. True life or limb threatening injuries
   b. Requires surgery within 8 hours

2. Urgent Cases
   a. Immediate surgical intervention would prevent significant impairment of function
   b. Surgery may be done if resources and personnel may be alloted to the case without negatively affecting the ongoing management of the COVID-19 pandemic

3. Elective Cases
   a. Chronic problems in which surgery may be delayed without adversely affecting the eventual outcome
   b. Surgery should be postponed or delayed until the pandemic is over

4. Fragility fractures
   a. Fragility fracture is a form of pathologic fracture that occurs in bone weakened by disease
   b. For these guidelines, fragility fractures of the hip refer to:
      i. Fractures in osteoporotic bone in patients 65 years old or older
      ii. Fractures in bone weakened by malignancy in a patient of any age

B. Establishing the Diagnosis of COVID-19 as it Relates to Treatment of Fragility Hip Fractures

1. All patients with fragility hip fractures MUST be tested for COVID-19 prior to surgery.
   a. Testing should be done as soon as possible upon admission in order to facilitate surgical intervention within 3-5 days (or even earlier) after admission.
   b. Methods:
      i. PCR-based COVID-19 test
      ii. Use of other diagnostic examinations such as chest x-rays and/or CT scans to aid in diagnosis
      iii. Other methods may be used as we learn more of the disease
   c. All COVID (+) patients should be referred to an infectious disease specialist for co-management. These patients may require transfer to an institution designated for COVID (+) patients only

2. Treatment of patients with fragility fractures in relation to the results of COVID testing:
   a. Surgery may be considered as urgent when the following are fulfilled:
      i. Fragility hip fracture in a COVID (-) patient with no pulmonary symptoms
      ii. Presence of necessary health personnel and skilled health workers
      iii. Proper precautions should be exercised and the proper use of personal protective equipment (PPE) should be enforced

b. Surgery must be delayed or patient should be transferred:
   i. Scenarios when delay or transfer should be considered:
      a. Fragility hip fracture in COVID (+) patients
      b. Fragility hip fracture in COVID (-) patients with pulmonary symptoms (mild, moderate, or severe)
      c. Fragility hip fracture in patients who cannot be tested for COVID-19 infection
      d. Lack of trained staff, space (e.g., room, ICU bed if it is forseen that patient may require it, etc), and/or equipment to treat the patient safely.
   ii. Continuation of care for patients in which surgery will be delayed:
      a. For COVID (+) patients, transfer to a hospital designated as a referral center for such patients. Traction, skin or skeletal, may have to be applied prior to transfer.
      b. For COVID (-) patients with pulmonary symptoms, referral to appropriate subspecialists (e.g., infectious disease consultant, pulmonologist) for further management with traction applied, either skin or skeletal, while waiting for the definitive management.
      c. For patients who are asymptomatic but cannot be tested, application of skin or skeletal traction should be applied.
      d. In those instances where surgery cannot be safely done due to lack of staff, space, or equipment, plans for appropriate transfer or referral to another hospital should be in place.

C. Procedure to Follow When Performing Surgery on These Patients

1. Patients for surgery should have been tested for COVID-19.
   a. Please see above for further details on how treatment should proceed once the results are known.
   b. Even if results are negative, the surgical team should treat all cases as potentially infected for their own safety.

2. The surgical team should preferably:
   a. Remove clothes from home and put into a garment bag upon arrival in the hospital.
   b. Ensure that non-essential items for the surgery (e.g., wallet, cellphone, personal effects) are not brought into the operating room itself.
   c. Change to scrub suits provided by the hospital. This would include shoe wear for hospital use only.

3. Patients should be transported with a mask. A specified path should be marked for patient transfers to and from the OR for both COVID (+) and COVID (-) patients.

4. During induction, only the anesthesiologist should be in the room. Preferably, induction should be done in an anteroom.
   a. Preferable mode would be spinal, epidural, or regional anesthesia.
   b. However, there is always the possibility that intubation may be needed.
   c. If intubation is required, preference is given to devices that will isolate the patient's head and neck from the anesthesiologist and the surrounding environment. Preferred PPE for anesthesiologist when performing endotracheal intubation are PAPR hood when available, otherwise surgical cap with face shield should be used, N95, isolation gown, gloves.

5. When positioning the patient:
   a. Use of an N95 mask, goggles or face shield, cap, and gloves is recommended.
   b. Always cover the OR shoes.

c. A gown (disposable or non-disposable) could be used for additional protection. However, since this is a respiratory infection, it would be better if the patient were wearing a mask during this time if spinal, epidural, or regional were used. If the patient were intubated, have the anesthesiologist cover the mouth and nose of the patient with a mask over the tube. An aerosol box to isolate the patient's head and neck may also be used for this purpose.

6. For actual surgery:
   a. For the surgical team, in addition to the N95 mask, goggles, cap, and gloves, a waterproof, disposable surgical gown is needed.
      i. A personal protection system incorporating a surgical helmet and surgical gown would be the best option.
      ii. If the above is not available, then the team can use a disposable raincoat perforated or opened at the back (to allow air flow) or waterproof apron under the surgical gown. Take appropriate measures that no unsterile portion will contaminate the field.
   b. For other personnel within the operating room (e.g., anesthesiologist, circulating nurse, etc) who are not scrubbed, the following should be worn: N95 mask, goggles, cap, disposable or non-disposable gown, and gloves.
   c. Instead of goggles, a face shield can be used as long as it does not interfere with movement.
   c. For the neck, it may be covered with gauze or any equivalent similar to the way we pad the thyroid shield when using fluoroscopy.
   d. Hazmat suit is not necessary.
      i. Although there are reports of aerosolization of blood with electrocautery, it has not been proven to cause an infection. This is a respiratory infection.
      ii. Hazmat suits are not plentiful and we have to conserve our resources for those frontline units that may need them more.
      iii. There is a risk of breaking sterility and thus increasing the risk of postoperative infections.

7. After surgery and once the patient is out of the room:
   a. The correct way of taking out PPEs should be followed.
   b. Gross contamination is cleaned with an alcohol-based solution. The room is then sterilized once more with UV light or hydrogen peroxide vapor in preparation for the next case.
   c. Remove scrub suits, shoe covers, mask, goggles, and cap in the prescribed manner.
   d. Consider taking a shower, if possible.
   e. Wear your street clothes or change to clean scrubs if you will be doing any more cases or procedures.

8. Plan for early hospital discharge (2-3 days or less, if possible) with coordinated multi-disciplinary care and with provisions for follow-up by phone, text messaging, or through video conferencing, as the case may be.

D. Methods to Reduce Aerosolization of Blood During Surgery

1. The use of tranexamic acid is recommended to lessen bleeding during surgery unless otherwise contraindicated. The recommended dose is 15 mg/kg, given 20 minutes prior to surgery.

2. Suctioning of cautery smoke is recommended to eliminate aerosols produced as a result of cautery. It is also recommended that a hypochlorite solution be added to the suction machine bottle. One percent solution of hypochlorite is recommended.

3. The use of Hydrogen peroxide as an irrigating solution is also recommended at a 50:50 mixture (1.5% hydrogen peroxide). This will serve a dual purpose of antiviral as well as for hemostasis. This is to be combined with Povidone-iodine wash at a 0.3% solution to take advantage of its synergistic effect with Hydrogen peroxide. Hydrogen peroxide however should not be left in enclosed cavities like the medullary canal as this may lead to air embolism.

4. Whenever possible, hemostatic agents designed to stop bleeding on contact be used in order to control bleeding.

5. It is preferred that no drain be applied to the surgical site but only if hemostasis is assured. Application of the drain will now be dependent on the surgeon's judgement.

6. It is recommended that skin closure be done via subcuticular technique using absorbable sutures. This would eliminate the need for patient to follow-up for removal of sutures. Skin adhesives may also be used when available.

7. Dressing of the wound should be waterproof. Specialized dressing like antimicrobial dressings are also recommended to minimize surgical site infection.

8. It is recommended that surgery for these patients be done expediently, surgeon should use the approach and the implant he or she is most familiar with that will address the problem of the patient.

E. Optimizing the Operating Room Environment

1. New institution-approved workflows for patient transfers, staff movement, equipment transfers, infection prevention, and decontamination should be enforced in the operating room.

2. There should be a dedicated or designated operating room for patients who are COVID (+) or PUI that is separate from the main operating room complex, if possible.

3. The operating room should have a negative pressure environment. Any positive pressure environment should be avoided.

4. In the absence of negative pressure environment, the operating room has to be equipped with an embedded or portable High Efficiency Particulate Air (HEPA) filter.

5. Only one entry/exit door should be used to minimize traffic and flow of contaminated air

6. The donning and doffing room for PPEs should be in separate rooms and the proper sequence/ procedure should be clearly displayed in these rooms for the staff to comply

7. The operating room should be sterilized with UV light or hydrogen peroxide vapor prior to any surgical procedure.

8. Limit the number of surgeries scheduled for the day in consideration of the extended turnaround time because of the revised workflow to include proper donning and doffing of the staff.

9. This dedicated OR should be equipped with an aerosol box for use during the entire procedure regardless of anesthetic technique

10. An equipment, instrument, drugs and consumables list shall be prepared prior to the surgery to ensure that all these are brought into the theater prior to start of surgery and to prevent frequent trips outside of the OR by the circulating nurse.

11. Limit the number of personnel inside the OR theater to the following -- surgeon, 1st assist, surgical tech, scrub nurse, circulating nurse, orderly, anesthesiologist, anesthesia assist.

12. All consoles and monitors shall be covered with transparent plastic wrap to facilitate immediate disposal after surgery and decrease risk of contamination.
13. All equipment and instruments shall be sterilized in the same institution where the surgery shall be performed.

F. Efficient Rotation of Orthopedic Surgical Teams During the COVID-19 Pandemic

1. Surgical teams should be dividied into three groups. Each team will perform surgeries for one week straight (i.e., team 1 does surgery during the first week, team 2 does surgery during the second week, team 3 does surgery during the third week, and the process will then repeat itself). They will also be responsible for looking after the patients in the floors during their week of duty. This will allow each team to have a 14-day quarantine period/rest between duty schedules.
2. Teams should not come in contact with each other. Endorsements may be done electronically after each rotation.

G. Non-Operative Management and Palliative Care

1. If surgery is to be deferred or delayed, refer to Ortho-Geriatric Multi-Specialty Team to optimize patient and to prevent medical complications.
2. Optimize pain management (refer to Anesthesia and/or Pain Specialist). It is recommended to avoid narcotics and strong opioids.
3. Patient may be referred to Rehab Med for bedside physical therapy and mobilization while admitted and provisions for continuing home therapy should be included in the discharge plan.
4. Consider application of balance skeletal traction if delays in surgery are expected especially for intertrochanteric/pertrochanteric fractures.
5. Use of pneumatic egg crate mattress if available.

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