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FIGHTING COVID-19 PANDEMIC OUTBREAK, CHALLENGES IN ORTHOPEDIC SURGERY AND APPLIED SAFETY MEASURES

Orthopaedics

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ABSTRACT

The sudden outbreak of coronavirus disease 2019 (COVID-19) has created not only a global health but has also impacted orthopedic surgery worldwide. India, with its large population and limited health resources, will be mostly impacted over the coming days due to rising cases of critically ill patients with COVID-19. It is important to understand the challenges for orthopedic surgeons in India when dealing with patients during the COVID-19 pandemic. With the pandemic, there is a shortage of doctors and support staff and even the ventilators, medicine and other equipment and devices. The principles of restriction, protection, avoiding and abridging are recommended. Communicating and Responding play a main role. The diversity and the breadth of orthopedic field lend surgeons to having an important role during this outbreak.

KEYWORDS

COVID-19; Pandemic; Orthopedics;

Introduction

The coronavirus disease 2019 (COVID-19) pandemic is a significant threat to the medical profession with the symptoms of shortness of breath, cough, low grade fever, alteration in taste and smell. The worldwide effect of this virus is having a significant influence on the practice of orthopedic surgery. Researchers identify an alarming shortage of critical orthopedics devices.[1,2] Through this article we discuss the challenges, effects, problems and their management to overcome the issues endangering the lives of healthcare workers to ensure the wellbeing of, staff and orthopedic surgeons from COVID-positive cases.

Challenges and Problems

There are only 20,000 orthopedic surgeons available to meet the needs of approximately 1.35 billion population, i.e. one surgeon for every 62,500 people[3] which needs a dedicated patient care but in the the current effect of COVID19, we are seeing broken bones and soft tissue injuries in our offices, through phone and video assistance. The most common injuries that bring our patients to the emergency room and hospital during this era are accidental traumas. A small but seemingly impactful challenge is ensuring that we do not lose connection behind our face masks but doctors and patients are now forming relationships without fully seeing each other's faces. We show extreme empathy to demonstrate the care and compassion that we usually rely upon our faces and warm touch to convey but now even the patients family members are not permitted to accompany their adult loved ones in the hospital. We are replacing in-person conversations with phone conversations. Be assured that communication remains the same high priority it has always been. When we plan for surgery in this era, it is important to know whether our patients have COVID-19. Most organizations have agreed that it is important to test patients but this testing takes time which itself is a threat to the patient with emergent open and vascular injury. Personal Protective Equipment (PPE) is another challenge at this time. When a surgical patient is intubated, COVID-19 may be released into the air.[4] In addition, some orthopedic procedures may also release COVID-19 into the air. For this reason, orthopedic surgery may take longer, as some of the measures that we take to ensure the safety of our patients, doctors, clinicians and staff take additional time. It should be kept in mind that orthopedic procedures generate huge amount of aerosol particles, especially during pulse lavage, while using power instruments like (a drill, saw or a burr) in intramedullary reaming. Aerosols and droplets form due to the mechanical disruption of blood or other body fluids during these procedures.[5] Pathogens surviving within these particles of < 5 micron suspended in the air may be inhaled and can trigger infection. One of the biggest challenges during this period is working with limited resources and also minimizing the use of essential items needed to care for critically ill patients, ICU beds, personal protective equipment (PPE), face masks, and ventilators. Currently there is only antigen testing for COVID-19. This tests for active infection and has a reported false negative rate of be-tween 10- 30%.

Other effects of COVID19 includes-

- Rescheduling of orthopedics OPDs
- Reduction in the supply of adequate orthopedic implants and instruments
- Delayed treatment of the fractures.
- Shortage of clinical staff.
- Delay in the exams of medical students.
- Research work and development of new essential instruments required are halted.

Management and Safety Measures

During the coronavirus pandemic, there should be increased emphasis on managing patients with non-operative strategies and minimizing outpatient visits. The safest place for patients during the COVID-19 crisis is not in the hospital rather their own home.

The British Association of Oral and Maxillofacial Surgeons (BOAMS) came down to four essential guidelines:

- PPE (personal protective equipment)
- Avoid (avoid contact, avoid transfer of patients, avoid surgery)
- Restrict (restrict number of visits, generation of aerosols, restrict visitors)
- Abbreviate (abbreviate waiting times, abbreviate treatment)

Personal protective equipment has been a huge challenge in our country. There are changing recommendations ranging from evidence based to availability based creating a massive confusion for healthcare workers. Where scrupulous care is taken and PPE used appropriately, healthcare worker infection can be incredibly low. Avoidance, restriction and abbreviation of contact by the use of virtual clinics, simplifying treatments, the use of braces and boots rather than plaster casts can all reduce number of visits to the hospital and also the exposure to densely packed waiting rooms which are a breeding ground for the disease. There is also an acceptance at this time that it may be better to accept a sub-optimal clinical outcome and avoid hospital inpatient stays now if there is a suitable remedy later (for example non-operative management of an ankle fracture that is likely to lead to arthritis but decreases the risk of COVID-19 infection. Orthopedic procedures using saws, drills and suction are all aerosol generating but laminar flow and theatres with high numbers of air changes are helpful in dispersal of the virus. Conservative treatment of fractures should be adopted wherever feasible, particularly for unreduced dislocations, septic arthritis, traumatic amputation, crush injuries, compartment syndrome, Cauda equina syndrome, multiple long bone fractures and compound injuries. Temporary measures such as steroid injections should be used where appropriate to postpone interventions.6 Guidelines published by the Indian Orthopedic Association should be followed by every orthopedic surgeon across the country.[7]

Safety Measures:

The hospital should be divided into areas affiliated with a level of risk.[8]
Level 1 – Applicable to pre-exam triage and general outpatient dept.

- Disposable surgical cap and mask
- Work uniform
- Disposable gloves and protective clothing

Level 2 – Applicable to A&E, isolation wards, fever clinics, ICU, specimen examination of suspected or confirmed cases, cleaning surgical instruments.

- protective mask (N95)
- Goggles

Level 3 – Applicable to surgical theatres on suspected or confirmed cases, intubation, tracheotomy, bronchoscopy, endoscopy, procedures with splash/spray secretions.

Minimize aerosol related spread by-

- keeping safe distance of 6 feet during clinical encounters
- Use Surgical masks for all time and while working in areas where air exchange is < 3 h
- N95 masks/positive pressure suits are recommended for medium/high risk clinical encounters.
- Eye protection is recommended for all clinical encounters.

Minimize direct contamination by-

- Hand washing with soap and water or disinfecting gels before and after every patient contact.
- A direct decontamination of all patient/staff contact points is vital (chairs, door knobs, pens, mouse etc.) many times during the working day.
- Avoid touching one's eyes, nose or mouth.

Operating room procedures

- Minimize personnel entering operating theatre.
- Ideally have a negative pressure operating area, a buffer zone and a clean zone.
- Put PPE on in the buffer zone; dispose of it in the buffer zone.
- Patients should have surgical masks and caps on.

Working teams-
Ideally divide into teams, with each team only being in a Level 2 or Level 3 area for 4 h at a time.[8]

Staff workers with comorbidities-
These comorbidities that place individuals at greatest risk are:

- Hypertension, Cardiac disease/cerebrovascular disease, diabetes, respiratory diseases[9]. Those treated with ACE-inhibitors and ARBs are at greater risks[10]. COPD is the most strongly predictive comorbidity for both severe disease and ICU admission[11]

Immediate measures-

- Organised duty roasters with minimal exposure days and time;
- Re-allocation of units and hospital wards if and when required;
- Attendance at outpatients must be restricted or curtailed – those attending must have prior screening in a secured environment; crowding must be avoided and distancing ensured;
- Additional space for real or potential COVID-19 patients must be identified and made available;
- A separate OT for COVID positive patients should be fully functional;
- Numbers of ICU beds (and ventilators) available must be supplemented;
- The number of team members in specific departments should be limited;
- Telemedicine, social media, Zoom online meetings for consultations, routine follow-up care, lectures, trauma meets, conferences, etc. must be fully utilized

CONCLUSION

During the COVID-19 Pandemic, conservative managements should be opted and operative treatments requiring minimal invasion and shorter surgical times should be preferred over complex and long orthopedic surgeries esp. those generating massive aerosols. The Current experience may serve as an opportunity for us in the post-COVID-19 phase with focus on improving pre-operative fitness for surgery, principles of early discharges after surgery and 'tele consultations' for follow-up, making sufficient availability of resources and infrastructures for unforeseen disasters as a key stones of future orthopedics. Orthopedic surgeons have their reputation built on their and versatility and strength.12 and in this era of massive disaster of COVID-19 we must stand together, with each other and with the wider healthcare community, adjust our practices, strengthen ourselves towards the patients who need us. Driven by joint replacement surgery, we are the exemplar of hand hygiene. We need to educate this to the rest.

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