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Impact of the recurrent wave of COVID-19 pandemics on orthopedics practice and training in India

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Abstract
Emerging pandemics show that humans are not infallible and communities need to be prepared. Coronavirus outbreak was first reported towards the end of 2019 and has now been declared a pandemic by the World Health Organization. Since then many researches are going worldwide to understand this corona virus disease, its impact on human body, prevention and treatment. As of now it has been observed that its can affect every organ of body and it's not only the respiratory manifestation but it has shown other clinical sign and symptoms in various patients. This review article is highlighting the impact of COVID-19 on on orthopedics practice and training in India which helps us to understand the various problems faced by orthopaedic community and guide us to overcome the recurrent waves of COVID-19.

Keywords: COVID-19, orthopaedic practice, bone health

Introduction
COVID-19 has hit all over the globe leaving its worst mark in the society including health care worker. As the novel coronavirus continued to spread to more than 80 countries, the World Health Organization declared it a pandemic on March 11, 2020. In India, the first case of COVID was recorded on 30 January 2020 and nationwide lockdown was implemented on 23 March 2020. After peak of first wave in September, 2021, it was assumed that life will come back to its normal routine but nearly six months after; in the first week of March 2021 signalled the arrival of the most disastrous and horrifying second wave of the pandemic [1]. Now we are currently facing highly infectious OMICRON strain of COVID and as per latest data new COVID cases have been risen to more than 3 lakh in January, 2022.
When the cases and fatalities jump to alarmingly high numbers, travel bans and restrictions are imposed by the government across the nation. Each medical speciality had to develop protocols within the local context to cope with the crisis of the increased burden of COVID patients in hospitals. The limited supply of resources and manpower forced all surgical branches to shift towards conservative management of those cases, which ideally require operative intervention.
After first lockdown declared nationwide, the orthopaedics field which encompasses both emergency and elective work also stumbled back. In orthopedics emergency, open fracture, proximal hip injuries and spinal trauma are associated with the highest mortality and morbidity. These injuries need the earliest management and mobilization [2] but these patients were worst affected as proper treatment was deferred due to this pandemic crisis. There was a sudden drop of 55%-80% of orthopaedic surgeries nationwide and orthopaedic surgeons were redeployed to other clinical domains that encountered a surge in manpower requirements, such as ICU, respiratory wards, emergency departments and isolation wards [3, 4].
Hence orthopaedic departments in India had to frequently calibrate and recalibrate their organisational structure and clinical operations to cope with the crisis evolved in all three waves. This article gives overview of impact of recurrent waves of COVID-19 on orthopaedics and solutions to overcome this recurrent waves.

The first wave of COVID-19
During the first wave of the epidemic, various orthopaedic societies developed protocols for managing emergency cases to give appropriate treatment as well as to save clinicians from cross-infection.

Necessary precautions were advised that includes careful pre-screening of patients and additional measures to treat patients with confirmed COVID-19. The latest updates of (April 2020) by IOA (Indian orthopaedic association) recommended surgeons worldwide to defer elective treatment for the next four weeks and focus was on high emergency cases [5] (Table 1) [2]. As there was a surge in the number of COVID-19 cases, this deferment was extended. It was advisable to assess the emergencies on a case-by-case basis and use of clinical judgement to aid in decision making. All orthopaedic surgeons were instructed to take special precautions in operating room and ward [6, 7]. Complete training of Donning and Doffing of PPE KITS and mask fitting exercises were carried out during this time. The orthopaedic department team began to work in the emergency and COVID ward with rotations to relieve first-line health care workers. Those who are coming in contact with COVID-19 patients advised 14 days isolation period to reduce cross-infection but it lead to sudden decrease in manpower for managing trauma and other orthopaedic emergency. Though this first wave was managed better than developed countries[8] but resulted in desecration of trauma, elective cases and PG training in orthopaedics.

In 2020 orthopaedics speciality observed an amid drop in elective surgeries and it has been analysed by Thirunarayanan *et al*. in a survey. In this report, he observed 49.5% of the surgeon's outpatient practice dropped by more than 75%. The section of surgeons who operated<5 cases per week before the pandemic was 39.4%, which Increased to 94.1% during the pandemic [9]. In another study done by Sudarshan P [10] in south India, it was observed that 84% of surgeons had suspended all elective surgeries and 56.7% discontinued all academic activities. The majority 85.6% performed only emergency cases and 4.1% has performed elective orthopaedic surgeries. Telecommunication was used by 76% to communicate with their follow-up patients while only 40% of them advised medications to new patients using the mode. Only 16.5% of surgeons kept their private clinics open during this period. [Chart 3] Another alarming data as intimated by the responses showed that 40.2% of the surgeons were not prepared to do work (non-orthopaedic) in an emergency. Still, 32% of the surgeons were already given that role in their institutions especially in the government setups, most of them 50%were not at all confident in managing medical emergency procedures (e.g., intubation and resuscitation etc.,). 66% of the surgeons felt it would take >8 weeks off now (2nd week of lockdown period) to recapitulate normal practice.

Lagging phase

As the cases started declining from September 2020 onwards in INDIA and it was assumed that life is returning back. All the orthopaedics departments across the country started their works while following the COVID-19 guidelines given by IOA which was based on the preservation of the resources as well as limiting the COVID exposure while doing surgeries. Briefly following changes were implemented after first wave of COVID pandemic for routine functioning of orthopaedics.

1. COVID-19 test (rapid antigen test or RT-PCR) was made compulsory for every patient before any surgery and universal precaution were taken in every case in the operating room.
2. Separate OT was kept for COVID positive and suspected cases in some institutes.
3. Along with trauma and emergency cases, electives procedures that were curtailed earlier has now been started to clear the backlog of patients with the emphasis of keeping patients with limited stay or day care protocols [11].

Most of orthopaedic departments started elective surgeries along with emergency trauam. Day-care surgeries were started to reduce the indoor burden of patients. All above measures were made to overcome the crisis created by this COVID-19 and helped in saving the resources with ability to work with reduced manpower especially in concern with the anaesthesia team.

The Second wave

In May 2021, INDIA faced peak of second wave and began to report nearly 4 lakh new COVID-19 cases as compared to 14000 cases in January [12]. No one was expecting such an outburst that resulted in a very high rate of mortality. Most government hospitals stopped routine work and converted into COVID dedicated centers.

In orthopaedics, all non-urgent elective procedures were cancelled. These included even those procedures that were to be done under local anaesthesia. In addition, non-urgent outpatient hospital visits have been postponed and measures were taken to limit nonessential footfall in the hospital. But Orthopaedic practise in second wave was different from first wave in following way:

1. Most institutes were prepared to separate COVID management unit from routine area.
2. Non-operative management of orthopaedic fractures was done where possible and appropriate
3. Elderly patients with hip fractures were operated in preference and more emphasis was given to reduce inpatient hospital stays as much as possible.
4. The use of teleconsultation were increased. In place of postponing follow up appointments, teleconsultations was arranged for patients to update their surgeon on their current condition.
5. Few hospitals had at least one dedicated OT reserved solely for trauma surgery. This was staffed with a consultant-grade orthopaedic surgeon to deal expediently with hip, spine and other fractures to shorten operative times and minimise postoperative complication.

Third wave

At the time of writing this article, India is experiencing a third wave of COVID infections. Cases are surging and Government data showed India is reporting more than 300,000 new infections everyday with the daily positivity rate (which measures the share of COVID-19 tests that are positive) at 13.11%. While India's health-care infrastructure is relatively better prepared to tackle the third wave, a rapid uptick in cases could potentially push it to the brink again.

During the third wave of COVID pandemic and government hospitals are already diverting all resources towards COVID care. In past the measures taken by the Indian government have been instrumental to some extent in flattening the curve of the pandemic [3]. In this third wave, when there is significant local community spread and rising numbers despite appropriate social distancing measures, precise planning was required to ensure that essential orthopaedic surgeries take place safely for orthopaedic surgeons and their team.

Discussion

Orthopaedics is one of the specialties severely affected by this pandemic. The cessation of orthopaedic surgeries has severely affected orthopaedic practice, training and research in 2021,

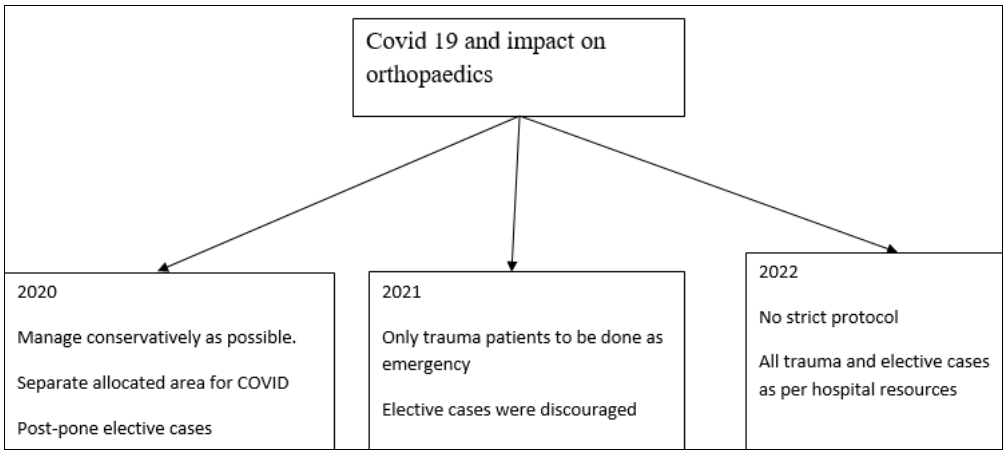
but it is also true that aerosol-generating procedures in Orthopedics like drilling, reaming, pulse lavage, electrocautery also added up to risks involved in getting transmission of COVID during surgery and outdoor patient screening [14]. The Accreditation Council for Graduate Medical Education (ACGME) based in the United States noted in an editorial that residents/fellows and attending surgeons will be sidelined for meaningful periods due to known exposure to the virus or becoming infected themselves[15]. There was a survey [16] in south India shows that 30% of residents believed that online teaching modality was not sufficient and 40% of residents did not feel prepared enough for surgery with this training. As a result, most of residents expressed themselves as definitely stressed out in the then scenario.

Shortage of doctors had urged hospital administrators to post residents across all medical fields in COVID duties. Orthopaedic residents were no exception and they too have been utilised for COVID duties. Such shifting of work has caused lots of anxiety, uncertainty and depression in residents. Educational and clinical conferences have already been disrupted by the need for social distancing, if not by clinical demands. We are also facing problems due to the sudden shifting of online teaching methods and modules. Continuous evaluation and feedback are essential for the knowledge and professional growth of residents but is strongly impaired by decreased surgical demands. There is one study published in March 2021 which highlighted the effect of COVID-19 on orthopaedic surgical training in Mumbai [9].

In our centre, which is a district hospital and serves a population of 1 million. After the first wave of COVID, 305 major surgeries were performed from September 2020 to march, 2021. In April 2021, only 41 cases were done. In May 2021 only 7 cases of COVID positive trauma patients were done (graph). We collected orthopaedic data of other two nearby hospitals and similar results were seen. Major surgeries were dropped by 82.5% (Table). OPDs services were withhold to stop transmission and diverting resources towards COVID care.

The drastic drop in OPD and surgery gave a lot of financial burden to small set up clinics and hospitals. From this study, we found a 58% and 84% decrease in OPD in 2020 and 2021(till date) respectively as compared to 2019. In the case of surgical procedures, there was a decline of 48% and 72% in 2020 and 2021 respectively (graph can be added). Due to financial constraints, some speciality clinics were converted to COVID care center [17].

Difficulties in manpower, optimization of available staff and lack of clear hospital policies has lead to poor impact on surgical emergency and elective cases. For example on average, 300–400 osteoporotic hip fractures were seen annually, which translates to 5–10 hip fractures managed per week in an orthopaedic department. In orthopaedics, proximal hip fracture is associated with the highest mortality rate. These injuries need the earliest management and mobilization. Following the guidance from Singapore and the royal college of Surgeons UK [12, 13] and given the vulnerability of this patient population in India, a higher preference for early surgery should be given to these patients. We suggest a two-team concept for stable functioning of the hospital in COVID crisis in which one clean team for operating non-COVID cases and another reserve team for COVID suspected cases, which require emergency intervention. Eachteam can be comprised of one senior surgeon with one assistant surgeon and two supporting staff. Two teams can work on alternate weeks for reducing cross-infection and continuous functioning of the hospital. So one team will always be available for management.



Conclusion

In this article, we have analyzed impact of COVID-19 pandemic on academic and clinical orthopaedic practice in India. The second wave of COVID-19 exposed the vulnerability of our healthcare system. While resources were channelized to manage the threat posed by the pandemic, patients with surgical ailments including orthopaedic conditions paid a heavy price. Now systems are realizing that the COVID virus, in one form or another, will stay with us. In the coming days, as we learn to live with COVID, it may be prudent to ensure sufficient experienced operating staff to support uninterrupted Orthopedic care. Appropriate operating protocols for the regular functioning of surgical branches will allow seamless patient care and quality orthopedic training.

Declaration

- Ethical Approval: yes approved
- Consent to Participate: Yes
- Consent to Publish: Yes
- Authors Contributions: AL has written literature and ES has collected Data and editing
- Funding: No
- Competing Interests: No
- Availability of data and materials: Yes

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