



IMPACT OF COVID 19 ON ORTHOPAEDIC PRACTICE IN A GOVERNMENT SETUP IN TELANGANA- CHANGING TREND OVER TWO WAVES CHALLENGES FACED AND IMPROVISATIONS.

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ABSTRACT **Introduction:** The Novel Corona Virus (Covid-19) Infection, Which Was First Reported In China In December 2019, Rapidly Spread Across The Entire World. Among 33 Districts Of Telangana, The Highest Cases Were Registered In Hyderabad Of About 13,410 Cases¹ The Objective Of This Paper Is To Highlight The Various Challenges Faced In This Covid Crisis In A Government Setup That Is Gandhi Medical College And Hospital Secunderabad With Available Sources And Constantly Growing Patient Load. **Material And Method:** We Have Divided The Entire Period Into Three Time Zones The 1st Zone Covid-1 From April 2020 To November 2020 (The First Wave,8 Months) , The 2nd Zone Covid And Noncovid From December 2020 To March 2021(Transition Phase Treating Both Covid And Noncovid, 4 Months) And The 3rd Zone Covid-2 From April 2021 To July 2021 (The Second Wave,4 Months). Patients Were Classified Into 6 Categories A B C D Ps And Pc Depending To The Time Of Intervention. **Results:** The Total Number Of Cases In All The Time Zones Together Was Around 14,895 Cases. We Treated Around 959 Covid Cases And 10538 Cases In The Second Time Zone. **Conclusion:** With the covid pandemic causing havoc globally it made the orthopaedic surgeons introspect into the modalities of conservative management and its challenges, giving emphasis to "LIFE SAVING OVER LIMB SAVING"² as the primary goal in management.

KEYWORDS : Covid positive, Orthopaedics, Government hospital, Telangana

INTRODUCTION-

The novel Corona virus (COVID-19) infection, which was first reported in China in December 2019, rapidly spread across the entire world. The first case of COVID-19 was reported in India on 30th January 2020. The World Health Organization (WHO) declared the COVID-19 outbreak as a global pandemic on 11th March 2020¹. To contain the pandemic, Government of India announced many steps such as nationwide lockdown on 25 March 2020, promoting social distancing, use of masks, personal protective equipment (PPE), setting up of COVID-19 hospitals, quarantine, testing facilities and tracing of contacts. As of 30 May 2020, India has had a total of 1,82,143 confirmed cases and 5,164 confirmed hospital deaths attributed to COVID-19. First COVID 19 cases were observed in Telangana on March 2, 2020, and the first death was reported on 29th March 2020. 16339 confirmed cases, 7294 recovered cases, and 260 cases were found deceased till June 30, 2020. Among 33 districts of Telangana, the highest cases were registered in Hyderabad of about 13,410 cases¹. Gandhi hospital was the prime nodal centre for the entire state initially and remained to stay one of the main nodal centres throughout the first and second wave. At a time when the covid cases were being transferred from all over the state to our hospital, it had an effect on all the departments and department of orthopaedics had to deal with the inflow of a large number of patients, as covid positive cases were not being admitted or operated anywhere in the state at that point of time.

MATERIALS AND METHODS

The objective of this paper is to highlight the various challenges faced in this covid crisis in a government setup that is GANDHI MEDICAL COLLEGE AND HOSPITAL SECUNDERABAD with available sources and constantly growing patient load.

We have divided the entire period into three time zones

1. 1st zone COVID-1 from April 2020 to November 2020 (the first wave, 8 months)
2. 2nd zone COVID and NONCOVID from December 2020 to March 2021 (transition phase treating both covid and noncovid, 4 months)
3. 3rd zone COVID-2 from April 2021 to July 2021 (the second wave, 4 months)

We are aiming to highlight the changing trend of type of cases admitted over these time zones the challenges faced and improvisations done in the most feasible and productive way.

DISCUSSION

1st zone

This was the first lockdown phase where Gandhi hospital was the only hospital for the entire state for state of Telangana which was designated to admit and treat covid patients. In the initial 4 months we had both isolation and positive wards but at the second phase of first wave where other government centre were being utilized as isolation centers our hospital became the tertiary centre where only all covid positive cases were admitted. In this time zone we treated around 2439 cases ranging from simple procedures like application of POP to amputations for crush injuries. We had cases of trauma, fall at home or after admission, post operative cases for wound dressings and suture removal etc.

Challenges faced and Improvisations

1. Covid 19 and orthopaedic patient
2. Triage of the patients
3. Preparing the wards and operation theatres
4. Training the staff

1.COVID 19 AND ORTHOPAEDIC PATIENT

It is well established that patients with fractures are susceptible to pulmonary infection, especially those with lower-limb fracture and limited ambulatory capacity⁴, making the association between trauma patients and COVID 19 infection more likely. The clinical characteristics and early prognosis of COVID-19 in patients with fracture tended to be more severe than those reported for adult patients with COVID-19 without fracture⁵. Balance had to be made in treating the covid complications and attending to orthopaedic issues. The aim in the pandemic was to save lives and regaining function of the injured limb than achieving absolute reduction of fractures.

2. TRIAGE OF THE PATIENTS

The most important aspect in this time zone was TRIAGE and deciding which cases were elective and which were emergency in the time of pandemic, as almost all cases were covid positive. The Ohio Hospital Association (OHA) defined elective surgeries as those not meeting the following criteria "threat to the patient's life if surgery or procedure is not performed threat of permanent dysfunction of an extremity or an organ system, risk of metastasis or progression of staging, or risk of rapidly worsening to severe symptoms⁶". Patients with stable diseases (low or moderate risk of clinical deterioration) can be postponed, while patients with unstable disease (risk of short-term clinical deterioration)

should be considered for surgery with precautions⁷. Farrell et al gave a description of management of paediatric traumatic and non-traumatic cases in their paper⁸. Massey et al gave a guide to managing the adult trauma cases in covid pandemic dividing them into categories based on the time of intervention from A to E, where A is emergency management within 24 hrs to E which can be managed after 3 months⁹. Iyengar et al in their paper on Revisiting conservative orthopaedic management of fractures during COVID-19 pandemic listed the indications and contraindications of conservative treatment in adult and paediatric cases in India¹⁰.

Based on the guidelines and recommendations of the above studies we made a customized TRIAGE system based on the patients coming to our hospital

We divided patients into A B C D and P(s and c) (FIG 1)

- A- Adult patients needing Emergency surgery within 24 hours
- B-Adult patients needing initial stabilization to be operated after covid negative approximately after 2 weeks
- C-Adult patients whom we can wait more than 2 months
- D-Adult patients where conservative management was definitive treatment
- Ps-Paediatric patients needing surgery
- Pc-paediatric patients managed conservatively

CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D	CATEGORY Ps	CATEGORY Pc
1.Compound injuries (grade 3a/b/c) 2. Crush injuries 3. Compartment syndrome 4. Degloving injuries 5. Tendon injuries 6. Dislocation/subluxation	1. All displaced fractures requiring fixation 2. compound injuries (grade 1/2) 3. Infected implant removal 4. Spine injuries	1. Arthroplasty -chronic OA knee and hip 2. Arthroscopy -IDK_Rotator Bankarts lesion	1. Closed undisplaced fractures 2. Chronic debilitated patients 3. Unfit for surgery	1. All displaced fractures 2. Dislocations 3. Compound injuries (grade 3a/b/c) 4. Crush injuries 5. Septic arthritis	1. All undisplaced fractures 2. All uncritical fractures 3. Club foot(CTEV) 4. DDH

FIG 1

3. PREPARING THE WARDS AND OPERATION THEATRES

During the initial few months we had isolation wards and covid positive wards and we had post operative ward prepared with beds. At a later stage we had only covid positive cases the isolation wards were all used for covid positive cases. The covid ward and post operative wards (FIG 2) were equipped with oxygen portals apart from AMC (ACUTE MEDIA CL CARE) and ICU (INTENSIVE CARE UNIT) even covid post operative wards had a provision for ventilator to manage any postoperative complications. In the wards the beds were placed 6 feet with the use of disposable sheets. The patient's attendees were not allowed inside as it was a high risk. We had hospital staff taking care of the patients.

Awad et al in their paper on Perioperative Considerations in Urgent Surgical Care of Suspected and Confirmed COVID-19 Orthopaedic Patients: Operating Room Protocols and Recommendations in the Current COVID-19 Pandemic gave a detailed description of the precautions to be taken while operating in covid 19 times¹¹. Neeradi et al published a study done in India and listed the protocols to follow in doing orthopaedic cases during the covid pandemic¹².

The following changes were made and precautions were taken in our hospital in operation theatres (FIG 3)

- i. Separate areas for the following donning, doffing, pre induction, surgery and immediate post operative were organized.
- ii. The air conditioner was used to a minimum to compromise for the laminar air flow theatre not feasible in the government setup.
- iii. The operation theatre door was not to be opened once the patient and the surgical team are inside.
- iv. Limited staff to be in the theatre during the surgery.
- v. Limited theatre access and movement in and out to medically/surgically essential purposes during the entire period.
- vi. Proper patient preparation and use of N-95 masks.
- vii. Use of PPE, head gear, eye protection (use of goggles and face shields), shoe covers and double surgical gloves by the staff.
- viii. Strict adherence to high standard of infection control and prevention.

- ix. Surface-tough equipment (like c arm, cautery foot pedals etc) and screens within the theatre were wrapped with plastic sheets or disposable sheets to facilitate decontamination (as the virus can survive within tiny grooves, under buttons, screens etc).
- x. Try to use disposable medical supplies/instruments as much as possible
- xi. Try to decrease the duration of the surgery as much as possible and long dissections (prefer mini open and MIPPO procedures).
- xii. Try to decrease blood spillage.
- xiii. The body fluids, blood, secretions, and pathological specimens should be collected in double sealed bags for inspection or destruction.
- xiv. Attention to avoid sharp injury or damage of PPE.
- xv. The settings of electrocautery were to be as low as possible and avoid long dissecting times to minimize the surgical smoke.
- xvi. All contaminated instruments and devices were washed and disinfected separately followed by proper labeling.
- xvii. The use of power tools like bone saws, reamers, and drills were reduced to the minimum and the power settings were used as low as possible, as they release aerosols, increasing the risk of virus spread.
- xviii. Disposable suction devices to remove smoke were used.
- xix. Proper disinfection and rotation of use of theatres.
- xx. Separate c arm was used in covid positive OT
- xxi. Separate set of instruments were used.

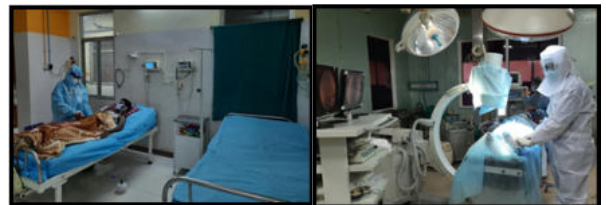


FIG 2 - COVID POST-OP WARD

FIG 3- COVID OT

4. TRAINING THE STAFF

We had seminars and workshops conducted for all the staff medical and paramedical (doctors, post graduates, interns , nurses , ward boys , technicians etc) in which precautionary measures were explained and demonstrated like donning and doffing of PPE ,avoiding wearing watches and earrings etc which can be the carriers of virus. The careful orthopaedic dressings following all precautions in the orthopaedic ward was a challenge. The symptoms to be identified and taking the tests when needed was explained. The hospital staff technical and nontechnical, surgeons and anaesthetists were asked to strictly adhere to the rotation of duties and quarantine accordingly thereby protecting our own staff directly and their families and community indirectly.

2nd ZONE

This time zone was the transition phase when we dealt with covid and noncovid cases simultaneously. This was the phase where the vaccinations were started in our country and health care workers among other frontline workers were being given and it was a ray of hope in all darkness. In our setup the government had made provisions for availability of covishield and covaxin vaccine. Emphasis was made that all the health care workers in our hospital were given the vaccine earliest for their safety as well as safety of the family members and community by preventing the spread.

Challenges faced and improvisations

- 1. COVID and NON COVID ZONES.
- 2. Start of OUTPATIENT services.
- 3. Start of ELECTIVE Operations.

1. COVID AND NON COVID ZONES

The following were divided into 2 zones casualty, wards (pre operative, post operative and general) , operation theatres (covid theatres -minor and major in ground floor and noncovid theatre -minor and major in first floor) , instruments, trolleys , c-arm and staff (medical and paramedical). The proper taking of history and testing (RAT-RAPID ANTIGEN TEST and RT-PCR) were a very useful tool to segregate patients.

Flow chart of patients after entering hospital is as follows (FIG 4)

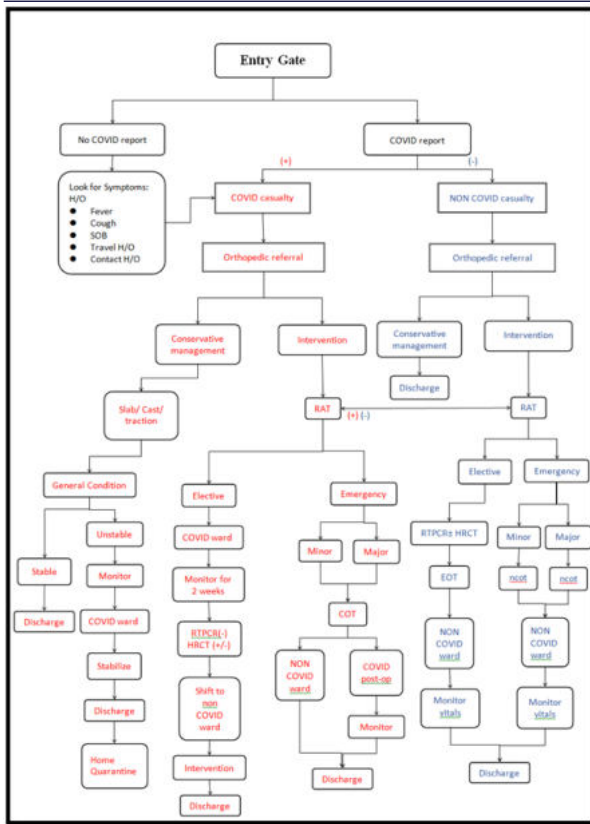


Fig 4 Flowchart

2. Start of OUTPATIENT services

Lal H et al have given an outline of the evolving model of outpatient services in India¹³.

- We adapted the following measures in our outpatient department
- i. Patients were made to stand outside in queue maintaining social distancing.(FIG 5)
 - ii. Staff made to sit outside near the queue allowing only one patient inside and without the attendees entering inside.
 - iii. Patients to wear mask (n95 /surgical/cloth/handkerchief tied securely as the last measure)
 - iv. The tables of the doctors to be maintained at a distance.
 - v. The patient stools to be placed 6 feet away from doctors.(FIG 6)
 - vi. Use of N-95 masks, head caps, protective eyewear (goggles or face shields) and gloves.
 - vii. Detailed physical examination of patients only when needed.
 - viii. X-rays to be taken only if absolutely necessary for either confirming the diagnosis or treatment.
 - ix. Giving long term treatment and physiotherapy protocols to patients to avoid frequent visits reducing the exposure except those cases that need regular follow up.
 - x. For patients coming from a long distance advice minor procedures like suture removal and removal of slab/cast after the recommended time in a nearby District hospital or Area Hospital or Taluka hospitals .

1. Start of ELECTIVE Operations.

We had to prepare the operation theatre for elective surgeries. Proper disinfection was done prior to starting admissions and swabs were collected from all operation theatres and sent for culture and sensitivity to the microbiology and respective department. The reports were awaited and the cases were posted when three consecutive culture swabs were negative. The RT-PCR test was a must and in all cases and any case with surgical or anaesthetic risk HRCT was a must (like cases lasting for longer duration, needing more dissection, upper limb surgeries needing General anaesthesia etc) The elective cases were fresh trauma cases, the cases belonging to category C in TRIAGE mentioned in time zone 1 and the old neglected cases with financial constraints unable to afford treatment in centre elsewhere. The old neglected cases were a challenge in themselves but we aimed at

functional regain of the limb rather than absolute reductions of fractures. Each case was individually analyzed and the treatment plan discussed as a team under the able guidance of the seniors and professors. We treated around 959 covid cases and 10538 cases in the second time zone ranging from, slabs casts, k wire to arthroscopy and joint replacements.



FIG 5 OP QUEUE

FIG 6 OP ROOM

3rd ZONE

This was the phase of second wave of COVID 19. The entire country and our hospital was anticipating the hit of second wave but the rise of cases was unexpected and the entire hospital was converted to a COVID centre again discontinuing the NON COVID services completely.

Challenges faced and improvisations

1. All the challenges faced in time zone 1 and improvisations
2. Follow up of patients from Time zone 2

The patients who come to our hospital are from the entire state so to have follow up of patients who were operated over 4 months in time zone 2 was a humongous task in itself as without proper follow up and physiotherapy the treatment is never complete.

- i. Anticipating the second wave long term physiotherapy and discharge advice was given to patients in case they could not come for follow-up so treatment could be completed at a nearby hospital.
- ii. Telephonic consultation was done to some crucial patients where in our post op protocol had to followed strictly like arthroscopic ligament reconstruction ,arthroplasty cases and complex trauma cases around major joints.
- iii. Progress of patient followed by telephonic documentation of scores.
- iv. Use of wats app to monitor wound healing and functional range of motion through photos and videos with consent from patient.
- v. We got in touch with other government hospitals which were still running their noncovid services and tried our best to coordinate with their orthopaedic and physiotherapy department, So that some of our noncovid patients who were coming for follow-up temporarily were getting the required help as our entire hospital was bearing the burden of saving COVID patients who could not afford treatment elsewhere.

RESULTS

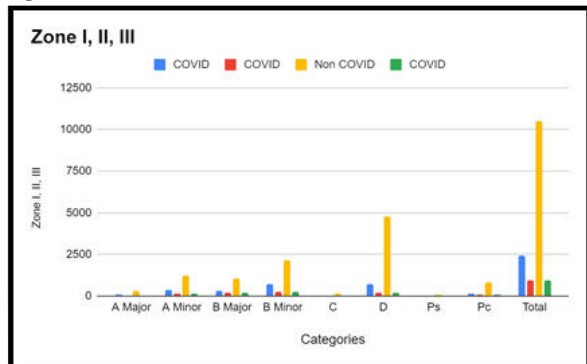
We have tabulated the cases we did in the three zones and separated the covid and noncovid cases (FIG 7),(FIG 8). The total number of cases in all the time zones together was around 14,895 cases. The major cases are those treated under anaesthesia and minor are those done under local anesthetic, haematoma block or no anaesthesia like slab or cast application, application of traction(skin and skeleton), reduction of dislocations and splint applications etc .The minimum cases belonged to category C followed by category A and the maximum cases belonged to category D which are those cases in which conservative management was considered as the final modality of treatment. The concept of saving lives became the main goal of management. In paediatric group also Pc had more numbers than Ps. With respect to time zones the maximum number of cases were managed in the time zone 2 which was the phase where we had both covid and noncovid cases in the hospital.

FIG 7 CASES

Zones	I	II	III
Category	COVID	COVID	Non COVID
			COVID

A	Major	64	32	330	32
	Minor	387	154	1228	154
B	Major	332	216	1054	216
	Minor	719	242	2147	242
C		32	19	112	19
D		711	198	4786	198
Ps		39	14	81	14
Pc		155	84	800	84
Total		2439	959	10538	959

Fig 8 Cases



CONCLUSION

In this paper we have highlighted the changing trend of type of cases admitted over the three time zones, the challenges faced and improvisations done in the most feasible and productive way in a government set up. In these challenging times we are aiming at improvising further and trying to work on feasible ways for better accommodation of more patients, protection of the staff and better follow up of patients. Preparedness in a pandemic phase is the most important and we are emphasizing this practical approach if cases increase in the near future. The evolution of orthopaedics was on the principle that “Life is movement , Movement is life ”. With the covid pandemic causing havoc globally it made the orthopaedic surgeons introspect into the modalities of conservative management and its challenges, giving emphasis to "LIFE SAVING OVER LIMB SAVING" as the primary goal in management.

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