

## Disruption of the Indian Orthopaedic Practice during the Coronavirus Disease-19 Pandemic

### ABSTRACT

**Aim:** This study aims to evaluate the impact of the coronavirus disease (COVID)-19 pandemic on orthopedic practice by conducting an online survey among the orthopedic surgeons in India. **Materials and Methods:** The survey (Google form) consisted of 20 questions concerning three topics: Four questions were addressed to the origin and surgical experience of the participant, 12 questions dealt with the potential disruption of orthopedic practice, and four questions addressed the influence of the pandemic on the particular surgeon. **Results:** Around 2000 orthopedic surgeons were contacted through email and social networking sites, of which 452 surgeons responded. Regarding arthroplasty procedures, only 17.2% of the participants stated that these procedures were being performed, of which 7.6% were operating regularly, while 9.6% were facing some delay. Around 80% of the participants stated that arthroscopic procedures were completely halted at their health-care centers. The surgeons also voiced their grievances regarding hampered post-operative follow-ups and physical rehabilitation. **Conclusion:** Due to the COVID-19 pandemic, the orthopedic practice in India is reported to be suffering from a severe disruption of services with a drastic reduction in arthroscopic procedures such as rotator cuff repair and cruciate ligament reconstruction and elective total joint arthroplasty. Only life and limb-threatening pathologies such as acute trauma management are currently being adequately attended to by most of the surgeons. The long-term effects of the lapse of services cannot be predicted as yet and should be considered very significant.

**Key words:** Orthopedic practice, Coronavirus disease-19, Elective surgery, Trauma, Total joint arthroplasty

### INTRODUCTION

The rapidly increasing coronavirus disease (COVID)-19 casualties during this pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2),<sup>[1]</sup> is currently perplexing the entire medical community all over the world. The pandemic is causing social disruption, overwhelming health-care utilization, and economic instability worldwide. Even though we, as orthopedic surgeons, do not deal with this disease directly it has certainly affected us. Elective surgeries, outpatient visits, outpatient procedures, post-operative follow-ups, casting schedules, and even emergency cases have had to be indefinitely postponed or halted.

Over the last few decades, total joint arthroplasty (TJA) and arthroscopic procedures have grown leaps and bounds and proved to be of great benefit to the healthcare system of the world. In a country like India where the doctor to patient ratios are already tilted unfairly, the priority of healthcare has also shifted. Pandemics of this global magnitude bring about significant changes in the health-care system. The need for utilization of staff and beds prioritized for COVID-19 patients and the ability of a surgeon to be able to arrange for operation theater and personnel for primarily emergency and even elective cases has been very difficult.

Curbing the spread of the COVID-19 virus has become the singular focus for India, and the measures implemented such as “lockdowns” and “curfews” have had a major impact on

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health-care services. Through the present survey, we are trying to investigate and quantify the effects on orthopedic practice by conducting an online survey among orthopedic surgeons all over India during this pandemic.

### MATERIALS AND METHODS

The study was designed as a prospective online survey of all the orthopedic surgeons and residents presently working anywhere in India. Around 2000 orthopedic surgeons and orthopedic residents were contacted for participation in the survey.

The participants were contacted using various modes of communication such as online forums, social media groups,

and word of mouth. They were asked to fill out an online survey form composed on Google Forms (<https://forms.gle/jWsemjXgaJLNNwXX8>) [Annexure 1], which is an online data collection program.

The survey consisted of 20 questions (single, multiple-choice, and ranked questions) divided into three keynotes:

1. Four questions to understand addressed the origin and surgical expertise of the participant.
2. Twelve questions dealing with the potential impact on orthopedic healthcare; and
3. Four questions to inquire of the influence of the pandemic on the particular surgeon.

The questionnaire was sectioned as follows:

1. Twelve questions offered multiple response options,
2. Six questions offered only one option.
3. A grid box with four different response options was created for obtaining responses regarding specific surgeries, with only one response possible per procedure.

A web link to the survey was then sent through email to the above mentioned 2000 orthopedic surgeons all over India on the April 31, 2020, with a reminder to those who had not yet responded after two days. The online survey was finally closed on the May 5, 2020. 452 of the approximately 2000 surgeons participated (22%). This number of participants has been considered adequate considering the uncertain times, we are currently facing. All the data that were gathered from the online database have been calculated as frequencies and percentages.

Approval by an institutional ethical board was deemed unnecessary since no patient data were involved and the survey was kept anonymous.

## RESULTS

A total of 452 orthopedic surgeons and residents participated and completed the online survey. Participation from 24 states was noted, with a major representation of 26% of the total participation from the state of Maharashtra. About 51% of the

surgeons were primarily trauma surgeons and 45% were hip and knee surgeons. About 54.1% of the surgeons worked in an academic center, 33.7% in a private hospital, and 20% were running a private practice only. Of the total participants, 40% of the surgeons had more than 20 years of experience as a physician (including residency); with another 40.30% having <6 years of experience.

In regard to the potential disruption of orthopedic services, majority of the participants stated that elective inpatient procedures and outpatient procedures were no longer possible or needed to be cancelled [Figure 1]. They also communicated that their surgical volume was drastically reduced; some were delegated administrative work while others were even assigned non-orthopedic duties [Figure 2].

Regarding arthroscopic procedures, only few participating surgeons stated these procedures were still being performed uninterrupted, whereas a majority of the participants complained that the surgeries were either being cancelled or delayed. A small number of participants stated that elective TJA and revision arthroplasty procedures were still being performed at their centers, but maximum participants reported that acute traumatic fractures, septic, and sarcoma patients were being attended to without any hindrance [Table 1 and Figure 3].

Almost none of the participating surgeons were performing routine musculoskeletal surgeries. More than 81% of the participants have mentioned that they and their staff have received special COVID-19 training. Most of the participants have encountered COVID-19 positive patients in their hospital, along with many of them also observing the spread of the coronavirus among their fellow healthcare workers and hospital staff [Figure 4]. About 74% of the participants also complained about staff disruptions and 70% had concerns regarding the supply of orthopedic implants due to the pandemic.

Concerning follow-ups, all of the participants reported some sort of disruptions in their post-operative check-ups [Figure 5]. Physical therapy was also found to be significantly impaired. About 24.2% of the participants stated that their

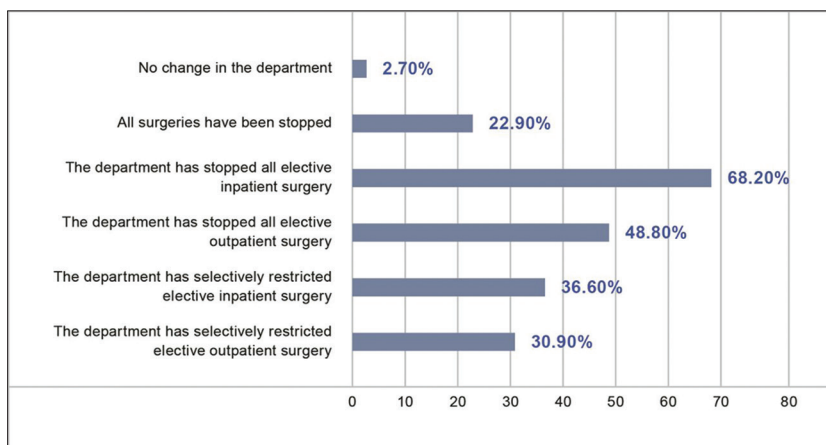
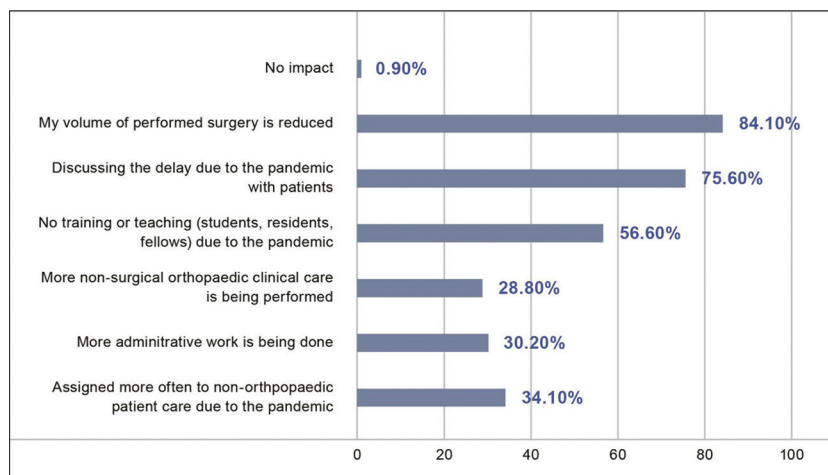


Figure 1: Effect of COVID-19 pandemic on your department?



**Figure 2:** Effect of COVID-19 pandemic on your orthopedic practices?

patients had no access to outpatient physical therapy with only 13.1% of the participants reported that rehabilitation centers were still functional.

A very genuine fear of infecting family and friends was noticed amongst the majority of the participants, only a meagre 2% were unconcerned by the risks. About 40% of the participants preferred to stay away from home and almost 75% of the participants mentioned that they were washing their hands more often and being extremely careful at work.

Responses to questions beyond the issue of treating patients were as follows:

- It was disclosed by 54.5% of the surgeons that professional meetings and conferences were still being held but with reduced staff, while 82.8% reported that the staff still participated in meetings but practiced safe social distancing. However, 30.3% of the surgeons were holding meetings through teleconferencing.
- The use of telemedicine as a mode of communication has also increased. Majority of the participants have been using various digital platforms for communicating with their patients, with a preference to video conferencing using Skype or Zoom [Figure 6].

## DISCUSSION

The survey conveyed a drastic disruption in the orthopedic practice in India. A major decrease in the arthroplasty procedures such as total hip and knee arthroplasty was reported. Likewise, there was an almost complete shutdown of arthroscopic repairs such as rotator cuffs and meniscal surgeries in the country. About 22.9% of the surgeons stated that all orthopedic surgeries were completely halted at their workplace.

Arthroplasties and arthroscopic surgery have the following positive impact on the patient:

- a. Mobility, social life, and work capability
- b. Prevention of cardiovascular diseases

- c. Improves general health, decreases pain and improves joint function.

The benefits are more significant for elderly people. However, nowadays, these procedures are performed on young people also. Due to non-availability of these services due to the cutback in elective surgery, patients' immobility and inability to work leads to direct cost to society.<sup>[2]</sup> Indirectly, it affects the economic system due to the absence from work. Selective arthroplasty procedures performed during the pandemic also require more precautions regarding infection control<sup>[3]</sup> and safety of the patient, the surgeon, and the theatre personnel. Rehabilitation of the operated patients and post-operative follow-ups were also reported to be severely impaired.

The COVID-19 pandemic has impacted orthopedic practices not only in India but also across the world. Two other similar studies about the effects of the COVID-19 pandemic on orthopedic services have been conducted so far. The study by Thaler *et al.*<sup>[4]</sup> investigated potential disruptions in joint arthroplasty services all across Europe. Similar to our study, the authors used an online survey to ask arthroplasty surgeons of (a) the European Hip Society and (b) the European Knee Associates about cutbacks in TJA. Thaler *et al.*<sup>[4]</sup> reported that out of the 272 participants, only 5.9% were still able to offer primary elective TJA. About 3.8% of the participants reported that aseptic arthroplasty revisions were still taking place. They further communicated that 87.2%, 75.6%, and 25.8% of their survey participants were operating on periprosthetic fractures, doing septic arthroplasty revisions, and tumor arthroplasties, respectively.

Similarly, in Germany Liebensteiner *et al.*<sup>[5]</sup> also conducted a study including the members of the AGA-Society of Arthroscopy and Joint-Surgery (Gesellschaft für Arthroscopie und Gelenkchirurgie) AGA. This study consisted of 1399 members, of which 10–30% of the participating surgeons reported a massive cutback in arthroscopic procedures. Furthermore, in this study, only 6.2% of the participants stated that elective TJA was still being performed at their center.

**Table 1:** Effect of COVID-19 pandemic on orthopedic surgeries?

Types of surgeries	Still performed	Stopped/Delayed	Not provided in our department
Elective primary total joint arthroplasty (TJA)	7.60%	82.80%	9.60%
Aseptic Total Joint Arthroplasty revisions	11.80%	40.90%	47.30%
Arthroscopic meniscectomy/meniscal repair	20.40%	63.40%	16.20%
Arthroscopic anterior cruciate ligament repair/reconstruction	22.40%	63.10%	14.50%
Diagnostic arthroscopy (knee, hip, shoulder, etc.)	18.20%	60.40%	21.40%
Other arthroscopic repair (e.g. shoulder and hip)	25.40%	59.20%	15.40%
Osteosynthesis in femoral neck fracture	85.10%	4.50%	10.40%
Osteosynthesis in femoral shaft fracture	83.30%	8.40%	8.30%
Surgical treatment for acute fractures of the upper extremity	86.40%	2.90%	10.70%
Surgical treatment for acute fractures of the lower extremity	82.30%	6.40%	11.30%
THA/hemi-arthroplasty in femoral neck fractures	78.70%	10.40%	10.90%
Periprosthetic fracture	56.20%	12.40%	31.40%
Surgical treatment for acute fractures of the spine and pelvis	48.10%	10.70%	41.20%
Vertebroplasty/kyphoplasty	48.90%	8.80%	42.30%
Spinal decompression	16.00%	30.20%	53.80%
Spinal fusion	8.30%	40.70%	51.00%
Surgery for septic indications (e.g., muscle, and bone)	76.10%	9.30%	14.60%
Amputation	67.40%	20.50%	12.10%
Open biopsy of a suspected tumor	31.60%	11.10%	57.30%
Surgery for bone sarcoma	10.40%	4.30%	85.30%
Peripheral nerve decompression surgery (e.g., carpal tunnel release)	12.80%	73.20%	14.00%
Removal of implants (e.g., plates, screws, and nails)	12.00%	82.80%	5.20%
Arthrodesis (e.g., ankle, foot, and hand)	3.40%	74.10%	22.50%
Limb length discrepancy correction	0.90%	18.50%	80.60%
Tendon repair/reconstruction (Achilles tendon)	8.40%	56.30%	35.30%

When taken together, the results of both these studies by Thaler and Liebensteiner were quite congruent with the findings of this study. This is to say that only emergency fractures, malignancies, and severe infections are being treated emergently. However, the comparability of all three studies might be impaired because the study at hand consulted orthopedic surgeons from all divisions as well as orthopedic residents without any specificity whereas the study of Liebensteiner preferred arthroscopic surgeons, while Thaler consulted arthroplasty surgeons primarily. Another aspect possibly influencing the comparability is the origin of the participants, in our study, all the participants were based in India. While the earlier studies by Liebensteiner and Thaler included surgeons from European countries.

When we compare our study with studies from other fields, we found some similarities in a study conducted by Angelico *et al.*<sup>[6]</sup> in the field of organ transplantation. A reduction of at least 25% in major organ transplantation was reported throughout the coronavirus pandemic which was very similar to the reduction in healthcare in our department. According to

Angelico, since beds at the intensive care units were reserved for COVID-19 patients there was a decrease in the necessary facilities available for other procedures.

Due to the restrictions imposed by the Indian government and also patient reluctance to step out from their houses, telemedicine has been promoted extensively and is being used by more than 62% of the participants. However, there are multiple inadequacies in telemedicine<sup>[7]</sup> such as legal issues, online prescriptions, drug abuse, and the ability to communicate mortal diagnosis. Surgeons that were using it were using online web-based applications such as zoom and face time for communicating with their patients.

In our study, we have also tried to report the impact of COVID-19 on the social life of the orthopedic surgeons by demonstrating the effects and changes that have had to be implemented by the surgeons to keep their families safe. As mentioned in our results, most of the surgeons have had contact with infected patients or infected hospital staff. Therefore, 98% of the participating surgeons have brought about changes in the interaction with their families to reduce

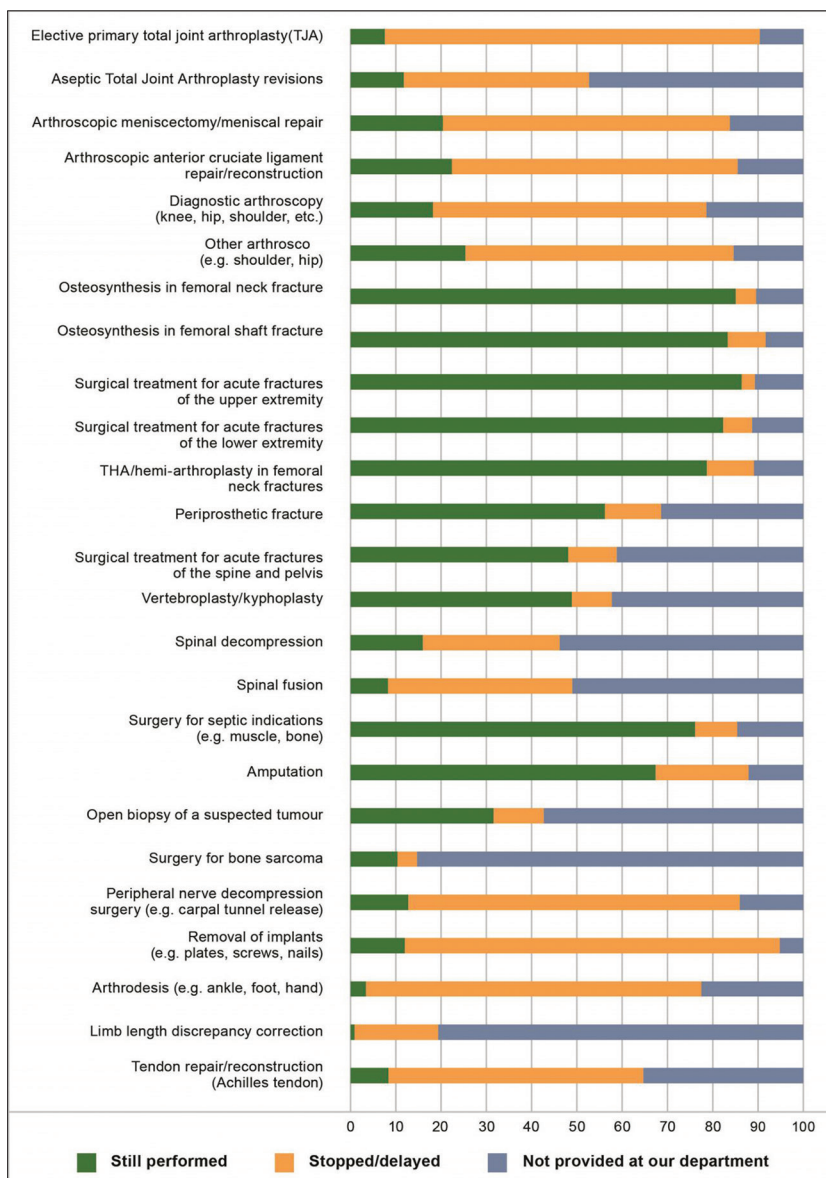


Figure 3: Effect of COVID-19 pandemic on orthopedic surgeries?

the risk of further community spread. While most of them have made changes in their daily routine and lifestyle, 40% of the surgeons have reported completely isolating themselves by staying away from home. These situations have a tremendous strain on the social and emotional life of the surgeons and that should be one of our primary concerns.

Like every other study, there are limitations to this study that need to be acknowledged. The findings from India cannot be correlated to other parts of the world, as each country will have their own experiences with the COVID-19 pandemic. Second, the respondents came from various states that have different strategies and rules to deal with the pandemic and these states are at different levels of severity of the pandemic during the survey period. Third,

the representation of the surgeons from different states of India is also not uniform.

It is regarded as strength of the study that 452 orthopedic surgeons from India participated in the survey. Over 1.3 billion people living in India, representing approximately one-sixth of the world’s population are being served by over 20,000 orthopedic surgeons. The survey should, therefore, be regarded as providing substantial information on the severe disruption caused to orthopedic practices due to the COVID-19 pandemic. The severe disruption that is being referred to does not indicate just a simple delay, but it also includes the eventually compromised outcomes due to the surgical treatments not being carried out promptly as per pre-pandemic times. The long-term effects of such a decline are

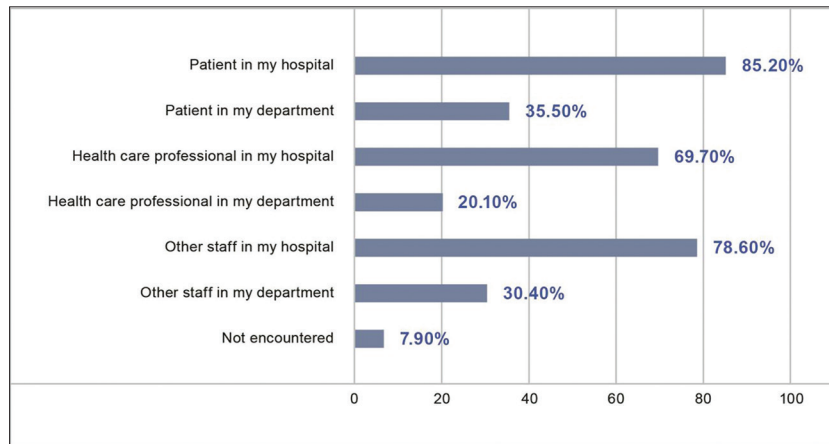


Figure 4: Have you encountered a person who has been tested positive for COVID-19?

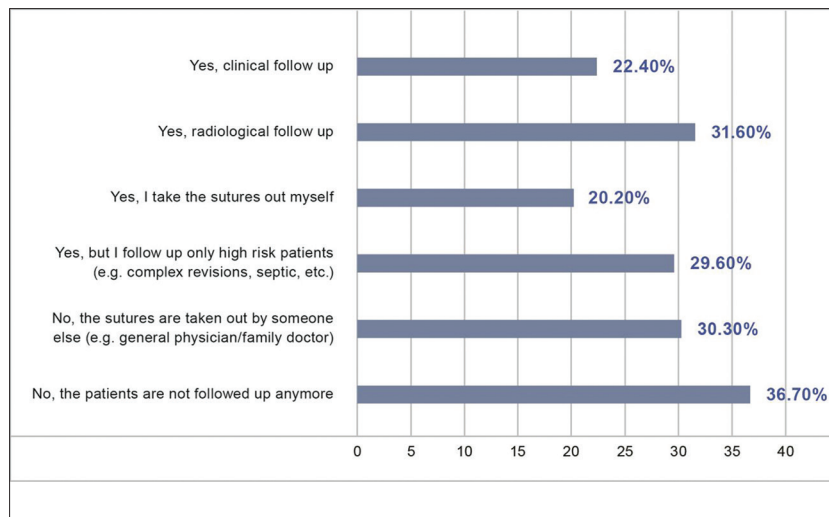


Figure 5: Do you still perform follow-ups on your patients?

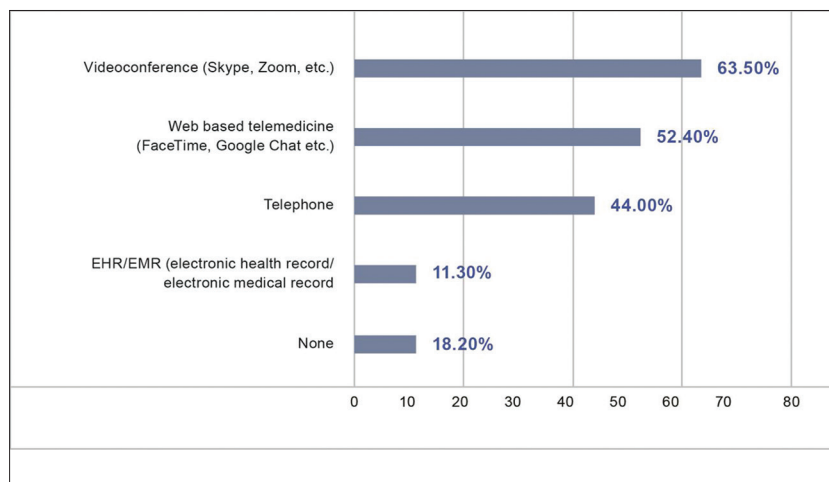


Figure 6: Use of technology for patient care

difficult to gauge quantitatively but can be termed as very significant.

## CONCLUSION

With the drastic decline in all elective arthroplasty and arthroscopic surgeries, the orthopedic practices in India have faced a huge setback. Trauma and malignancy are the only life-threatening pathologies amongst all orthopedic cases that are currently being attended to during this unprecedented crisis.

The journey ahead is uncertain and may invariably differ from country to country. It may even differ in different states of the same country depending on where it stands on the pandemic curve. The uncertainty is even greater considering India has a population of 1.3 billion, and the COVID-19 virus is not supposed to have reached its peak yet.

We were clueless at the onset of this pandemic but collectively as a surgical team, we have progressed significantly. As per our survey, most surgeons believe that the ramp-up back to normal will be in the next three–six months. We sincerely hope that once we see a decrease in the COVID-19 cases in our country or procure a definitive treatment, the orthopedic health-care system will gradually resume its role in society. This will definitely need to be measured, unhurried, and filled with caution.

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