

# Impact Of COVID-19 On Patients Requiring Spine Surgery: A Tertiary Level Government Trauma Hospital Experience

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## ABSTRACT

**Background:** The COVID-19 outbreak caused by the SARS Corona virus 2 (SARS-CoV-2), that appeared in Wuhan, China in December 2019 evolved into a pandemic and caused a devastating effect in all aspect of life. The aim of this study is to determine the impact of Covid-19 on the management of spine patients requiring surgery and to observe the functioning of a trauma center in a pandemic situation.

**Methods:** A retrospective study was performed at National Trauma Center, Kathmandu, Nepal from January 1 2019 to February 28 2020 (Pre-Covid period) and March 1 2020 to April 30 2021 (Covid Period). All patients undergoing spine surgery were included and details regarding demographics, diagnosis, surgical procedures were obtained and compared between pre- covid and covid period and also between complete lockdown period and partial lockdown period of the covid duration.

**Results:** The mean age of the patients undergoing surgery in the Pre covid period was  $(40.4 \pm 14.51)$  years and covid period was  $(38.9 \pm 14.00)$  years. The number of spine surgeries performed during the pre covid period was 295 whereas the number decreased to 197 in the covid period. The total number of non traumatic spine surgery in the pre covid period was 22.03% of the total spine surgery cases where as it decreased to 11.68% in the covid period. Similarly out of the total cases instrumented surgery was 91.86% in the pre covid period whereas it was 97.97% in the covid period. While analyzing the spine surgery done in the COVID period we found that most of the cases of surgery done in the complete restriction period was of traumatic spine only (97.77%) where as in the limited restriction period non traumatic spine surgery was also increased with traumatic spine surgery accounting for 85.52% of the total spine surgery cases.

**Conclusions:** The COVID pandemic has had a direct impact on traumatic and non-traumatic spine surgeries performed in this center.

**Keywords:** COVID-19; government tertiary hospital; spine surgery

## INTRODUCTION

The first covid positive case in Nepal was reported on 24<sup>th</sup> January 2020 and since then, the number has exponentially increased.<sup>1</sup> For a population of 30 million and doctor to patient ratio of 1:1724 and availability of 1 ventilator for 1,14,000 of the population, faults in the already fragile healthcare system were about to appear.<sup>2, 3</sup> As of 23 December 2021, there have been 276,436,619 confirmed cases of COVID-19, including 5,374,744 deaths, reported to WHO.<sup>4</sup>

Since the evolution of this pandemic, with no definitive treatment and limited availability of vaccines the only

strategy forwards was the implementation of lockdowns, social distancing measures and curtailing non-essential services and travel. The implementation of these measures since March 2020, had an impact on the delivery of spine services at National Trauma Center, a high volume tertiary referral center in Nepal.

## METHODS

This was a retrospective observational study conducted at National Trauma Center, Kathmandu, Nepal from January 2019 to April 2021. The study period was divided into pre-COVID period ( January 2019 to February 2020) and COVID period ( March 2020 to April 2021) of

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14 months each and comparison between pre- COVID and COVID period was done. The COVID period was further categorized into complete lockdown and partial lockdown periods. The complete lockdown period was between 24 March 2020 to 21 July 2021 and rest of COVID period was considered partial lockdown period. All patients undergoing spine surgery were included and details regarding demographics, diagnosis, surgical procedures were obtained from hospital and discharge records. Data retrieved was compared between pre-COVID and COVID period and also between complete lockdown period and partial lockdown.

## RESULTS

The mean age of the patients undergoing surgery in the Pre covid period was (40.4 ± 14.51) years and covid period was (38.9 ± 14.00) years.

**Table 1. Number Of Surgery Performed In Pre Covid And Covid Period.**

	Pre-COVID	COVID	P value
Total no cases	295	197	
Instrumented	271 (91.86%)	193 (97.97%)	<0.001 (chi-square =20.85)
Non-instrumented	24 (8.14%)	4 (2.03%)	
Trauma	230 (77.97%)	174 (88.32%)	<0.001 (chi-square =27.43)
Non-trauma	65 (22.03%)	23 (11.68%)	

\*P value <0.001, statistically significant

The number of spine surgeries performed during the pre covid period was 295 whereas the number decreased to 197 in the covid period (p value <0.001) which was statistically significant. The total number of non traumatic spine surgery in the pre covid period was 22.03% of the total spine surgery cases where as it decreased to 11.68% in the covid period. Out of the total non traumatic cases in the pre covid period 53 cases were of degenerative spine and 1 case was of spine tumor surgery where as in the covid period the cases of degenerative spine and spine tumor was 18 and 2 respectively. Similarly out of the total cases instrumented surgery was 91.86% in the pre covid period whereas it was 97.97% in the covid period.

Also we studied the pattern of spine surgery in the covid period dividing it to complete restriction period (lockdown) and limited restriction (partial lockdown).

**Table 2. Type Of Spine Surgery During Covid Period.**

COVID period	Complete Lock Down	Partial lockdown	P value
Total no of cases	45 (22.84%)	152 (77.16%)	
Mean Age (SD)	39.44 (14.51)	38.75 (13.90)	
Instrumented	44 (97.77%)	149 (98.03%)	0.91
Non-instrumented	1 (2.23%)	3 (1.97%)	
Trauma	44 (97.77%)	130 (85.52%)	0.02, (chi-square=5.054)
Non-trauma	1 (2.23%)	22 (14.48%)	

\*p value <0.05 is statistically significant

While analysing the spine surgery done in the COVID period we found that most of the cases of surgery done in the complete restriction period was of traumatic spine only (97.77%) where as in the limited restriction period non traumatic spine surgery was also increased with traumatic spine surgery accounting for 85.52% of the total spine surgery cases. The comparison between instrumented and non instrumented in the partial and complete lockdown period was not statistically significant (p value 0.91) but the comparison between traumatic and non traumatic cases in partial and complete lockdown was statistically significant (p value 0.02)

Besides analysing the spine surgery in pre covid and covid period we also analysed the rate of COVID positivity in the health workers in the hospital which definitely influenced the number of cases that were operated in the COVID period. We studied the rate of COVID positivity among Orthopaedic Surgeons, Orthopaedic residents, Anaesthetist and staff nurses.

**Table 3. COVID Positivity Among Health Workers.**

	COVID Positive	COVID Negative	Total
Orthopaedic Surgeons	9 (27.27%)	24 (72.73%)	33 (100%)
Orthopaedic Residents	21 (75%)	7 (25%)	28 (100%)
Anaesthetists	4 (36.37%)	7 (63.63%)	11 (100%)
Nurses	102 (58.28%)	73 (41.72%)	175 (100%)

We found that among the health workers the highest

proportion of COVID positivity was seen among the Orthopaedic residents with 21 out of 28 that is 75 % of the residents were tested positive for Corona virus infection.

## DISCUSSION

The COVID-19 outbreak caused by the SARS corona virus 2 (SARS-CoV-2), that appeared in Wuhan, China in December 2019, has now evolved into a pandemic. The virus has spread to almost every region of the world with devastating consequences on life and economy. National Trauma Center is a high volume tertiary referral trauma hospital in the country.<sup>5</sup> Thirty cervical spine trauma and ninety one dorsal and lumbar spine trauma have been surgically treated in the center between December 2015 and August 2017 <sup>6, 7</sup> and the number is increasing every day but the pandemic has had a profound effect on the number of surgeries performed in the center and also the number of non-traumatic spine surgeries performed must have drastically decreased.

The hospital admission rate for non COVID cases has decreased in the COVID period.<sup>8</sup> The COVID 19 had a substantial effect on surgeons and patients who require surgical care.<sup>9</sup> The deferment of elective cases during the COVID 19 pandemic will have a long lasting impact on the health care system<sup>10</sup> as the waiting time for elective surgery have increased substantially in the pandemic period.<sup>11</sup> All the surgical field have had an impact due to the pandemic and elective spine pathologies have also been decreased in the COVID 19 era.<sup>12</sup>

In our study also we found the overall spine cases operated in our center decreased in the COVID 19 pandemic and non traumatic spine surgery in the pre COVID period was 22.03% of the total spine surgery cases where as it decreased to 11.68% in the COVID period. Even in the COVID period the elective surgery rate was 2.23% in the complete lockdown period and 14.48% in the partial lockdown period.

Also RT-PCR positivity was common among the health care providers in the COVID 19 period as compared to general population.<sup>13, 14</sup> This also definitely impacts the service provided in the hospitals. In our study also we found that among the health workers the highest proportion of COVID positivity was seen among the Orthopaedic residents with 21 out of 28 that is 75 % of the residents were tested positive for Corona virus infection since they were the first to attend the patients. All this results in shortage of health care providers which have definitely had a negative impact on our service.

## CONCLUSIONS

The COVID pandemic has had a direct impact on traumatic and non-traumatic spine surgeries performed in this center. Non-traumatic elective cases were more affected due to COVID pandemic. The implication of lockdown on quality of life, physical and psychological disability in patients awaiting surgery for elective spine procedures needs further assessment.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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