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Letter to the Editor Regarding “COVID-19 Impact on Neurosurgical Practice: Lockdown Attitude and Experience of a European Academic Center”



We read with great interest the article by Lubansu et al,¹ “COVID-19 impact on neurosurgical practice: lockdown attitude and experience of a European academic center.” In their article, the authors shared their experience during the coronavirus disease of 2019 (COVID-19) pandemic in Belgium and discussed their institute protocol and workflow for treatment of neurosurgical patients.¹ In Belgium, the first patient with COVID-19 was reported on February 4 and the first COVID-19–related death was confirmed on March 11, 2020. As a response to the pandemic, certain measures were taken at their institute, including the use of tele-medicine, the replacement of meetings and physical classes with video-conferences or webinars, and implementation of a social distancing policy. Non-urgent elective surgeries and outpatient activities were suspended. Wards, resources, and teams were redeployed in anticipation of the potential congestion according to the latest national and institutional forecasts. Because surgical activity was reserved for critical and semi-urgent surgeries, the total number of operated patients decreased from 308 to 154 (–50%), and emergent surgeries decreased from 75 to 29 compared with a similar period in 2019.

The COVID-19 pandemic has been sweeping across the world and has stretched the capacities of health-care systems globally. As of September 18, 2020, India’s tally of confirmed COVID-19 cases had reached 5,130,305, making it the second most affected country in terms of absolute numbers, with 84,372 COVID-19–related deaths, the third highest after the United States and Brazil.^{2,3} Since the onset of the pandemic in our country, we adopted measures very similar to those outlined by Lubansu et al,¹ including the use of telemedicine, webinars, social distancing policies, appropriate modifications in operating rooms, creation of dedicated COVID-19 areas, and suspension of nonemergent surgeries.^{4–10} Our department has seen a major change in the volume and spectrum of patients treated. During the period of lockdown in India (March 25 to May 31, 2020), our surgical volume decreased from 111 to 53 (–52.3%), although the number of emergent surgeries remained the same (47 cases), compared with the same period in 2019.⁴ Thus, we were able to continue providing emergency services even during the lockdown, although most of the “nonemergent” cases had been postponed or cancelled. Similarly, a large number of elective or “non-emergent” surgeries were cancelled or postponed in hospitals across the world in response to the COVID-19 pandemic.^{10–19}

We adopted an institute policy of testing all patients admitted to the ward and, now, test them once more before surgery.^{4,8} Thus, we have been considering every patient admitted to the hospital as suspected of having COVID-19. This policy of universal testing is important owing to the highly infective nature of the virus. The performance of 2 tests before surgery has reduced the false-negative findings from 29% to 8.41%, because the sensitivity of the tests available is only 71%.⁵ If the need for emergent surgery does not allow for preoperative COVID-19 testing, the patient will undergo surgery in a dedicated COVID-19 operating room with the necessary COVID-19 precautions. Such patients then

undergo COVID-19 testing postoperatively and will be moved to a non–COVID-19 area if the test result is negative. We believe that our policy of COVID-19 testing and strict quarantine and isolation rules have been instrumental in allowing us to maintain the infection rate in our health care personnel to an acceptable level, allowing continued functioning in the hospital.^{6,8} According to Lubansu et al,¹ the Belgium’s health ministry guidelines have reserved COVID-19 testing for patients requiring hospital admission and suspected of having COVID-19. The same is apparent in their institute protocol, because they seemed to rely heavily on the findings from computed tomography of the chest, with COVID-19 testing limited to suspected patients only and not performed for all patients.¹

Despite this, 20 of 176 patients (11.4%) admitted for neurosurgery tested positive for COVID-19 in their study.¹ Thirteen patients (65%) in the COVID-19 group had presented with stroke compared with 17% in the non–COVID-19 group. The mortality rate was remarkably high at 45% and even higher for patients requiring surgical intervention (77%; 7 of 9 patients).¹ In contrast, from April to August 2020, we had 284 neurosurgical admissions, with only 6 patients (2.1%) testing positive for COVID-19. Only 1 patient had presented with stroke (patient 2). Three patients had undergone surgical intervention, two had received conservative treatment, and one had refused surgery (Table 1). We have a policy to postpone surgery for COVID-19–positive patients when the situation permits. This policy has been supported by a seminal report, which showed that in patients with perioperative COVID-19 infection, the 30-day mortality after elective surgery was 23.8%, with pulmonary complications occurring in 51.2%.²⁰ Two patients (patients 5 and 6) requiring surgery had tested positive for COVID-19 preoperatively. For both patients, the surgery was performed only after isolating the patients for 14 days in a dedicated COVID-19 area and after 3 consecutive negative test results. None of the 6 patients with COVID-19 in our series had died.

This difference in the proportion of COVID-19 positivity and low mortality rate among patients can be attributed to the different genetics and immune system responses, regional contrasts in obesity levels and general health, in addition to the quick reaction time to the crisis in India.²¹ In addition, the coronavirus strains prevalent in India and China appear to be less virulent than the strains isolated from Italy, Spain, and the United States.²² The number of COVID-19–related deaths per 1 million population for India and China, South Korea and Indonesia, Pakistan, Japan, and Thailand was 3, 5, 7, 6, and <1, respectively. In contrast, the number of COVID-19–related deaths per 1 million population in Germany, Canada, the United States, and Britain, Italy, and Spain ~100, ~180, nearly 300, and >500, respectively.²¹ Belgium has witnessed a high number of deaths per 1 million inhabitants (801 per 1 million) and a case-fatality ratio of 16.3%.¹ It would also be interesting to know whether the patients with COVID-19 reported by Lubansu et al¹ had undergone surgery immediately or after isolation and with negative COVID-19 test results, because the perioperative mortality has been significantly greater for patients with perioperative COVID-19 infection. In addition, it would be interesting to know how many of the 176 patients had actually undergone testing for COVID-19.

Table 1. Details of Neurosurgical Patients Who Tested Positive for COVID-19

Pt. No.	Age; Sex	Diagnosis	Comorbidities	Management	OPD; Emergency	COVID-19 Test Results	Outcome at Discharge
1	47; M	C5–C7 intradural extramedullary tumor	None	Refused surgery	OPD	Positive at admission; isolated, tested negative; advised surgery, refused; discharged against medical advice	Same
2	60; M	Left thalamic bleeding with intraventricular extension	Diabetes, hypertension	Conservative	Emergency	Tested positive 3 times at admission; isolated, tested negative twice	Improved
3	15; M	Severe traumatic brain injury (right frontal contusion with diffuse axonal injury)	Familial adenomatous polyposis	Conservative	Emergency	Tested positive twice; isolated, tested negative once	Improved
4	80; M	Left chronic subdural hematoma with mass effect	None	Left frontal and parietal burr hole and drainage	Emergency	Tested negative preoperatively; surgery; tested positive in postoperative period; isolated, tested negative twice	Improved
5	28; F	Operated case of medulloblastoma with spinal metastasis (received adjuvant radiochemotherapy)	Pregnant (24 weeks' gestation)	T11-T12 laminectomy and excision of spinal metastasis	OPD	Tested positive preoperatively; isolated, tested negative 3 times; surgery	Improved
6	42; M	Left posterior third parasagittal meningioma	None	Left parieto-occipital craniotomy and Simpson grade 3 tumor excision	Emergency	Tested positive twice preoperatively; isolated, tested negative 3 times; surgery	Improved

Pt. No., patient number; OPD, outpatient department; COVID-19, coronavirus disease 2019; M, male; F, female.

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REFERENCES

- Lubansu A, Assamadi M, Barrit S, et al. COVID-19 impact on neurosurgical practice: lockdown attitude and experience of a European academic center [e-pub ahead of print]. *World Neurosurg* <https://doi.org/10.1016/j.wneu.2020.08.168>, accessed September 14, 2020.
- Ministry of Health and Family Welfare. Home. Available at: <https://www.mohfw.gov.in/>. Accessed July 27, 2020.
- Worldometer. Countries where coronavirus has spread. Available at: <https://www.worldometers.info/coronavirus/countries-where-coronavirus-has-spread/>. Accessed August 8, 2020.
- Goyal N, Venkataram T, Singh V, Chaturvedi J. Collateral damage caused by COVID-19: change in volume and spectrum of neurosurgery patients. *J Clin Neurosci*. 2020;80:156-161.
- Venkataram T, Goyal N, Dash C, et al. Impact of the COVID-19 pandemic on neurosurgical practice in India: results of an anonymized national survey. *Neurol India*. 2020;68:595.
- Goyal N., Venkataram T., Dash C., Chandra P.P. Letter to the editor regarding "COVID-19's Impact on Neurosurgical Training in Southeast Asia." *World Neurosurg* (accepted).
- Goyal N, Venkataram T, Dash C, Chandra P. Letter to the editor regarding "Impact of COVID-19 on an Academic Neurosurgery Department: The Johns Hopkins Experience" [e-pub ahead of print]. *World Neurosurg*. <http://doi.org/10.1016/j.wneu.2020.07.216>; accessed September 2, 2020.
- Deployment of neurosurgeons at the warfront against COVID-19 [e-pub ahead of print]. *World Neurosurg* <https://doi.org/10.1016/j.wneu.2020.09.009>, accessed September 10, 2020.
- Goyal N, Chaturvedi J, Arora RK. Letter to the editor regarding "neurosurgical referral patterns during the COVID-19 pandemic: A United Kingdom experience." *World Neurosurg*. (accepted).
- Dash C, Venkataram T, Goyal N. Neurosurgery Training in India during COVID-19 pandemic: Straight from the horse's mouth. *Neurosurgical Focus*. 2020; December. In preparation.
- Nourelidine MHA, Pressman E, Krafft PR, et al. Impact of the COVID-19 pandemic on neurosurgical practice at an academic tertiary referral center: a comparative study. *World Neurosurg*. 2020;139:e872-e876.
- Marini A, Iacoangeli M, Dobran M. Letter to the editor regarding "coronavirus disease 2019 (COVID-19) and neurosurgery: literature and neurosurgical societies recommendations update". *World Neurosurg*. 2020;141:536-537.
- Deora H, Mishra S, Tripathi M, et al. Adapting neurosurgery practice during the COVID-19 pandemic in the Indian subcontinent. *World Neurosurg*. 2020;142:e396-e406.
- Fontanella MM, De Maria L, Zanin L, et al. Neurosurgical practice during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic: a worldwide survey. *World Neurosurg*. 2020;139:e818-e826.
- Khalafallah AM, Jimenez AE, Lee RP, et al. Impact of COVID-19 on an academic neurosurgery department: the Johns Hopkins experience. *World Neurosurg*. 2020; 139:e877-e884.

16. Gilligan J, Gologorsky Y. Collateral damage during the coronavirus disease 2019 (COVID-19) pandemic. *World Neurosurg.* 2020;140:413-414.
17. Antony J, James WT, Neriamparambil AJ, Barot DD, Withers T. An Australian response to the COVID-19 pandemic and its implications on the practice of neurosurgery. *World Neurosurg.* 2020;139:e864-e871.
18. Bernucci C, Brembilla C, Veiceschi P. Effects of the COVID-19 outbreak in Northern Italy: perspectives from the Bergamo neurosurgery department. *World Neurosurg.* 2020;137:465-468.e1.
19. Low PH, Mangat MS, San Liew DN, Hieng Wong AS. Neurosurgical services in the northern zone of Sarawak in Malaysia: the way forward amid COVID-19 pandemic [e-pub ahead of print]. *World Neurosurg* <https://doi.org/10.1016/j.wneu.2020.09.045>, accessed September 14, 2020.
20. Nepogodiev D, Bhangu A, Glasbey JC, et al. Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study. *Lancet.* 2020;396:27-38.
21. Why US, Europe were hit harder by COVID-19? Scientists look at regional disparities, immune system. *Hindustan Times*, May 29, 2020. Available at: <https://www.hindustantimes.com/world-news/why-us-europe-were-hit-harder-by-covid-19-scientists-look-at-regional-disparities-immune-system/story-5PRVoDaGsRjS9Xn2H6MaSO.html>. Accessed August 10, 2020.
22. US, Italy strain more virulent than one in India: top Indian microbiologists. *National Herald*. Available at: <https://www.nationalheraldindia.com/national/us-italy-strain-more-virulent-than-one-in-india-top-indian-microbiologists>. Accessed August 10, 2020.