



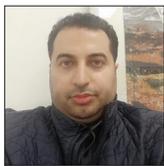
Letter to the Editor

Experiences of a neurosurgical center in the United Kingdom during the COVID-19 pandemic

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Received : 24 November 2020

Accepted : 11 May 2021

Published : 07 June 2021

DOI

10.25259/SNI_845_2020

Quick Response Code:



The coronavirus disease 2019 (COVID-19) spreads rapidly throughout the United Kingdom (UK) between the months of March and May 2020 and has killed more than 60,000 people.^[4] Our institution – as a regional center for infectious diseases – admitted and treated the very first cases of COVID-19 in the UK. Our institution is also a Level I trauma center and home to the regional neurosurgical center, serving a population of over 3 million people, and is comprised two inpatient wards, a day surgery ward, four operating theaters, and a neurocritical care unit. The COVID-19 pandemic significantly disrupted the activity of the neurosurgical department in all aspects of our service and we aim to share our experiences from these months in this letter.

SERVICE REORGANIZATION

As COVID-19 infections rose exponentially in the UK at the beginning of March, the UK government announced the deferment of all elective operations to prioritize resources.^[1] A countrywide lockdown was instituted on March 23 to halt community transmission^[11] and COVID-19-specific beds (Nightingale hospitals) were set up in major cities.^[10]

The neurosurgical service was also substantially reorganized in line with the hospital's preparations for the pandemic. One inpatient neurosurgical ward was converted to a "COVID-19" ward and junior neurosurgical staff and neurosurgical nurses were redeployed to manage these patients. The neurocritical care unit transformed into an intensive care unit for COVID-19 patients with limited capacity for ventilated neurosurgical patients. The other inpatient neurosurgical ward was restructured to create two monitored bays akin to a high dependency unit. Patients requiring Level 2 care were managed here, including those with external ventricular drains (EVDs). Training was offered to nursing staff in managing EVDs while senior nurses and specialist nurses with critical care experience were redeployed to this ward. Work schedules were altered to allow for a consultant-led ward round daily; anesthetic consultants also attended to review those with Level 2 needs. Junior and senior resident rotas were altered to accommodate for unplanned sick leave and self-isolation measures. All emergency and planned admissions were admitted into an isolated cubicle and screened for COVID-19; any COVID-positive patients were transferred to the designated COVID-19 wards under joint care of neurosurgery and medicine.

Multidisciplinary meetings, for example, for neuro-oncology, became virtual meetings, conducted over secure video platforms. Face-to-face departmental meetings were curtailed and, when required, strict social distancing practices were undertaken, and attendance was limited.

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All outpatient clinics became a virtual affair. Initially, telephone consultations were being held with patients, but this was soon replaced by video consultations. The number of clinics, however, remained the same.

OPERATING DURING THE PANDEMIC

Following governmental guidance, all planned operations were put on hold and daily briefings were held between the neurosurgeons and anesthesiologists to prioritize cases for theater for the upcoming week. Guidance from the Society of British Neurosurgeons^[12] was utilized to identify those patients at highest risk of deterioration, that is, those with life-, limb-, or sight-threatening conditions, and these cases were promptly operated on in the next available list. Aerosol-generating cases, such as trans-sphenoidal pituitary surgery or skull base cases where an air sinus may be opened, were postponed if there was no risk of neurological deterioration in the interim.

Only two neurosurgical theaters were open for use: one for emergency cases and the other for planned priority cases. COVID-19-positive patients and emergency admissions without an available COVID-19 test available were operated on with appropriate personal protective equipment and theater staffing levels were kept to a minimum in these cases.

Although operations were prioritized according to urgency, there were multiple occasions when cases were cancelled on the day due to a lack of intensive care beds, either due to staffing issues or COVID-19 admissions, which greatly added to patients' anxieties. Rescheduling operations were difficult due to the limited theater capacity. As more evidence emerged on the postoperative morbidity and mortality in COVID-19 patients,^[3] scheduled operations on patients with COVID-19 were postponed, if possible, to limit these risks. Emergency operations continued to be performed without undue delay.^[5]

TEACHING AND TRAINING

Weekly face-to-face departmental teaching sessions and journal clubs were halted. Nationally, the British Neurosurgical Trainees' Association organized weekly virtual teaching sessions and journal clubs, which were open to all residents.^[2] Various international neurosurgical societies and departments also delivered high-quality teaching sessions over video platforms.

Operative volume for trainees – in both planned and emergency cases – drastically declined during the pandemic months. Restrictions on staffing levels within the operating theater also limited the number of residents who could “scrub in” and learn.

Exposure to the spectrum of neurosurgical pathologies was also greatly reduced as patients chose to avoid

seeking healthcare services^[9] due to infection concerns. Specifically, the volume of patients presenting with traumatic brain injuries and spine pathologies was markedly reduced at our institution, compared to the months preceding the pandemic.^[6] Similar trends were seen nationally and internationally with admission rates for stroke^[7] and ischemic heart disease.^[8] Notwithstanding patient's fears about nosocomial transmission, the overwhelming focus on COVID-19 in the wider health-care system and media has led to patients not seeking medical attention for potentially serious neurological symptoms, for example, headache from subarachnoid hemorrhage, and presenting in a delayed manner with established neurological dysfunction. Delays in performing neuroimaging for outpatients also contributed to delayed diagnosis in neurosurgical patients.

CONCLUSION

The COVID-19 pandemic has wreaked havoc throughout the UK and greatly destabilized the national health-care service. Although neurosurgery has not *per se* been in the frontline of managing COVID-19 patients, our services have been significantly curtailed as part of the wider fight against the pandemic, as we have reported in this letter. Once “normality” returns to neurosurgery, colleagues worldwide should be prepared for a deluge of patients presenting to our departments, operating theaters, and clinics as services reopen. There is an ever-present risk of neurological deterioration in our patients and we remain concerned that patients may present in a delayed manner after the pandemic with significant, and irreversible, neurological dysfunction.

With the negative impact of COVID-19 on neurosurgical practice, referral volumes, and surgical waiting lists, collaborative efforts need to continue across the health-care system to identify solutions in managing this burden once the pandemic wanes. Future work will involve assessing the effectiveness of the measures taken to improve our service in the aftermath of the pandemic.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: ElGhamry AN, Jayakumar N, Ross N. Experiences of a neurosurgical center in the United Kingdom during the COVID-19 pandemic. *Surg Neurol Int* 2021;12:259.