

style of online communication was a new mode in this special period, with advantages such as convenient and quick. It could be an effective supplement to daily work and would be utilized into work in future.

COVID-11. THE BRAIN TUMOR AND NOT FOR PROFIT AND CHARITY EXPERIENCE OF COVID 19: REACTING AND ADJUSTING TO AN UNPRECEDENTED GLOBAL PANDEMIC IN THE 21ST CENTURY

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The COVID-19 pandemic has not only affected individuals, but also disease specific not-for-profits and charities. Brain tumor not-for-profit and charitable organizations around the world exist in all shapes and sizes, and address unmet needs of the patients and caregivers they serve. The International Brain Tumor Alliance (IBTA) carried out an international survey to identify organization changes brought about by the virus and the approaches adopted to address operational challenges created by COVID-19. A 37-question survey was sent across the world. In total, 77 organizations from 22 countries responded. Descriptive statistics and content analysis were used to present RESULTS: Responses fell into three categories: 1) organizational characteristics, 2) the impact of COVID-19 on services, and 3) how COVID-19 has affected the financial and human resources in these organizations. Although organizational characteristics vary widely, common concerns reported across organizations were primarily: a) the disruption of activities which impacted organizations' abilities to offer their usual services and b) challenges to sustaining funding. Although brain tumor organizations have been impacted by the COVID-19 pandemic, organizations quickly adjusted to this unprecedented global healthcare crisis.

COVID-12. THE LONGITUDINAL IMPACT OF COVID-19 PANDEMIC ON NEUROSURGICAL PRACTICE

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OBJECTIVE: This observational cross-sectional multicenter study aimed to evaluate the longitudinal impact of the coronavirus disease 2019 (COVID-19) pandemic on neurosurgical practice. METHODS: We included 29 participating neurosurgeons in centers from all geographical regions in the Kingdom of Saudi Arabia. The study period, which was between March 5, 2020 and May 20, 2020, was divided into three equal periods to determine the longitudinal effect of COVID-19 measures on neurosurgical practice over time. RESULTS: During the 11-week study period, 474 neurosurgical interventions were performed. The median number of neurosurgical procedures per day was 5.5 (interquartile range [IQR]: 3.5–8). The number of cases declined from 72 in the first week and plateaued at the 30's range in subsequent weeks. The most and least number of performed procedures were oncology (129 [27.2%]) and functional procedures (6 [1.3%]), respectively. Emergency (Priority 1) cases were more frequent than non-urgent (Priority 4) cases (178 [37.6%] vs. 74 [15.6%], respectively). In our series, there were three positive COVID-19 cases. There was a significant among-period difference in the length of hospital stay, which dropped from a median stay of 7 days (IQR: 4 – 18) to 6 (IQR: 3 - 13) to 5 days (IQR: 2 - 8). There was no significant among-period difference with respect to institution type, complications, or mortality. CONCLUSION: Our study demonstrated that the COVID-19 pandemic decreased the number of procedures performed in neurosurgery practice. The load of emergency neurosurgery procedures did not change throughout the three periods, which reflects the need to designate ample resources to cover emergencies. Notably, with strict screening for COVID -19 infections, neurosurgical procedures could be safely performed during the early pandemic phase. We recommend to restart performing neurosurgical procedures once the pandemic gets stabilized to avoid possible post-pandemic health-care system intolerable overload.

COVID-13. EFFECTS OF COVID-19 PANDEMIC ON NEUROSURGICAL ONCOLOGY PRACTICES AT INOVA HEALTH SYSTEM: AN INSTITUTIONAL EXPERIENCE

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INTRODUCTION: Amidst the unprecedented nationwide ban on elective surgeries during the COVID-19 pandemic, concern regarding timely and safe treatment of patients with intracranial tumors has been raised in the neuro-oncology community. METHODS: A retrospective chart review was performed on all patients who underwent treatment for intracranial tumors from 3/12–7/1 for 2019 and 2020. Dates aligned with declaration of State of Emergency through the multi-phase public re-opening. Primary comparative endpoints included case volume, median time to surgery, chemotherapy, and radiation, and COVID-related mortality. RESULTS: Overall surgical case volume decreased by 26.6%, while a 46.9% decrease was evident during the ban on elective surgeries. Case reduction occurred only for glial (p= 0.33) and pituitary tumors (p=0.04) where volume was nearly identical for other tumors. Median time to surgery was 2.5 days (range: 0–9) for high-grade glioma patients, 3 days for metastases, 3 days for meningiomas, and 26 days (range: 0–98) for pituitary adenomas, not significantly different from 2019. Time to chemoradiation and planned number of treatments were without significant difference. Among 2,795 Covid-19 patients treated in our institution, only four had brain tumors. Only one patient experienced delayed radiation treatment (three weeks) due to inability to achieve seroconversion prior to planned simulation. Only one COVID-related mortality in our cohort occurred. DISCUSSION: The pandemic did not significantly delay type and time to treatment for neuro-oncology patients at Inova. With swift implementation of PPE and strict peri-operative testing, we provided standard of care treatment without increases in COVID-19 contraction or mortality. Decreases in overall case volume are likely due to ongoing cultural avoidance of seeking medical care; deferment of endonasal surgery may be attributed to a known greater mortality for ENT procedures. Future patient care challenges include establishing clinical significance of seroconversion for asymptomatic, COVID-19 infected patients without delaying necessary systemic treatment.

COVID-14. TELEMEDICINE REVIEW IN NEURO-ONCOLOGY: COMPARATIVE EXPERIENTIAL ANALYSIS FOR BARROW NEUROLOGICAL INSTITUTE AND GEISINGER HEALTH DURING THE 2020 COVID-19 PANDEMIC

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Coronavirus disease 2019 (COVID-19) has grossly impacted how we deliver healthcare and how healthcare institutions derive value from the care provided. At increased infectious risk on immunosuppressive therapies and often have mobility limitations. Adapting to new technologies and reimbursement patterns were challenges that had to be met by the institutions while patients struggled with decisions to prioritize concerns and to identify new pathways to care. With the implementation of social distancing practices, telemedicine plays an increasing role in patient care delivery, particularly in the field of Neurology. This is of particular concern in our cancer patient population given that these patients are often at increased infectious risk on immunosuppressive therapies and often have mobility limitations. We reviewed telemedicine practices in neurology pre-/post-COVID-19 and evaluated the neuro-oncology clinical practice approaches of two large care systems, Barrow Neurological Institute and Geisinger Health. Practice metrics were collected for impact on clinic volumes, institutional recovery techniques, and task force development to address COVID-19 specific issues. Neuro-Oncology divisions reached >67% of pre-pandemic capacity (patient visits and slot utilization) within 3-weeks and returned to >90% capacity within 6-weeks of initial closures due to COVID-19. The two health systems rapidly and effectively implemented telehealth practices to recover patient volumes. While telemedicine will not replace the in-person clinical visit, telemedicine will likely continue to be an integral part of neuro-oncologic care. Telemedicine has potential for expanding access in remote areas and provides a convenient alternative to patients with limited mobility, transportation, or other socioeconomic complexities that otherwise challenge patient visit adherence.

COVID-15. COVIDNEUROONC: A UK MULTI-CENTRE, PROSPECTIVE COHORT STUDY OF THE IMPACT OF THE COVID-19 PANDEMIC ON THE NEURO-ONCOLOGY SERVICE

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BACKGROUND: The COVID-19 pandemic has profoundly affected cancer services. Our objective was to determine the effect of the COVID-19 pandemic on decision making and the resulting outcomes for patients with newly diagnosed or recurrent intracranial tumors. **METHODS:** We performed a multi-centre prospective study of all adult patients discussed in weekly neuro-oncology and skull base MDTs who had a newly diagnosed or recurrent intracranial (excluding pituitary) tumor between 01 April and 31 May 2020. All patients had follow-up data at least 30-days after the index MDT date. Descriptive statistical reporting was used. **RESULTS:** There were 1357 referrals for newly diagnosed or recurrent intracranial tumors across fifteen neuro-oncology centres. Of centres with all intracranial tumors, a change in initial MDT management was reported in 8.6% of cases (n=104/1210). Decisions to change the MDT management plan reduced over time from a peak of 19% referrals at the start of the study to 0% by the end of the study period. Changes in management were reported in 16% (n=75/466) of cases previously recommended for surgery and 28% of cases previously recommended for chemotherapy (n=20/72). The reported SARS-CoV-2 infection rate was similar in surgical and non-surgical patients (2.6% vs. 2.4%, p > 0.9). **CONCLUSIONS:** Disruption to neuro-oncology services in the UK caused by the COVID-19 pandemic was most marked in the first month, affecting all diagnoses. Patients considered for chemotherapy were most affected. In those recommended surgical treatment this was successfully completed. Longer-term outcome data will evaluate oncological treatments received by these patients and overall survival.

COVID-16. THE COVID-19 PANDEMIC FROM A NEURO-ONCOLOGY PERSPECTIVE: STRATEGIES, PROTOCOLS, AND LESSON LEARNED

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INTRODUCTION: The COVID-19 pandemic has had an incalculable impact on our national healthcare system, and elective surgical procedures have been particularly affected. Given that brain tumors often straddle the line between elective and emergent procedures, the pandemic has presented unique challenges to the neuro-oncology community. Here, we present our institutional protocols to (1) maintain an active outpatient neuro-oncology practice, (2) triage surgical cases under limited operating room availability, and (3) safely resume research efforts. **METHODS:** Given the rapidly evolving nature of the pandemic, we based the development of our protocols on the Delphi system to achieve consensus across a multi-disciplinary panel of experts. Specifically, we used this system to develop (1) a standardized physical examination that could be implemented over tele-medicine and (2) a triage system for surgical cases. Research efforts were largely suspended in the early days of the pandemic, however protocols for enrollment in clinical

trials as well as the resumption of benchwork were also developed. **RESULTS:** From the COVID-19 shelter-in-place order (March, 2020) through May 2020, our department performed 96 surgeries for the resection of brain tumors compared to 127 such surgeries from the three months prior. During this time, using a modified Delphi procedure, we developed detailed protocols to triage tumor cases. Implementation of telemedicine outpatient visits allowed the continuation of the neuro-oncology clinic and, ultimately, the resumption of clinical trials. **CONCLUSIONS:** The protocols presented here offer several strategies to continue neuro-oncological care during the pandemic, including the surgical treatment of brain tumors. As we prepare for future outbreaks, these treatment algorithms will help ensure that patients with brain tumors receive the highest level of care independent of COVID-19.

COVID-17. TUMOR TREATING FIELDS FOR GLIOBLASTOMA THERAPY DURING THE COVID-19 PANDEMIC: EXPERT CONSENSUS ON USE AND EXPERIENCE

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BACKGROUND: The COVID-19 pandemic has placed excessive strain on health care systems and this is especially evident in treatment decision-making for cancer patients. Glioblastoma (GBM) patients are among the most vulnerable due to increased incidence in the elderly (median age 64 years, peak between 75–84 years) and the short survival time. A virtual meeting was convened on May 9, 2020 with a panel of international neuro-oncology experts with hands-on experience using Tumor Treating Fields (TTFields). The objective was to assess the risk-to-benefit and to provide guidance for using TTFields in GBM during the COVID-19 pandemic. **PANEL DISCUSSION:** Topics discussed included support and delivery of TTFields during the COVID-19 pandemic, concomitant use of TTFields with chemotherapy, and any potential impact of TTFields on the immune system in an intrinsically immunosuppressed GBM population. Special consideration was given to TTFields' use in elderly patients and in combination with radiotherapy regimens (standard versus hypofractionated). Finally, we discussed the need to better capture COVID-19 positive brain tumor patients to analyze longitudinal outcomes and subtle changes in treatment decision-making during the pandemic. **EXPERT CONSENSUS:** TTFields is a portable home-use device which can be managed via telemedicine and safely used in GBM patients during the COVID-19 pandemic. TTFields has no known immunosuppressive effects and is a reliable treatment modality with a relatively favorable side-effect profile. This is important during a crisis where other treatment methods might be limited, especially for elderly patients and patients with multiple co-morbidities. It is too early to estimate the full impact of COVID-19 on the global healthcare system and on patient outcomes and strongly recommended the need to collaborate with existing cancer COVID-19 registries (i.e. CCC19, ESMO-CoCARE, etc.) to follow CNS tumor patients. These efforts would have implications in assessing lessons-learned from this crisis and future guideline development.

COVID-18. POTENTIAL TO HARNESS SARS-COV-2 NEUROTROPISM IN THE DELIVERY OF ONCOLYTIC VIROTHErapy FOR THE TREATMENT OF HIGH-GRADE GLIOMA

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BACKGROUND: High-grade gliomas (HGG) pose therapeutic challenges stemming from blood brain barrier, infiltrative growth, suppressed immune function, and tumor heterogeneity. Oncolytic viruses (OVs) are gaining traction for addressing these challenges. There is evidence that the SARS-CoV-2 glycoprotein spike binds the ACE-2 receptor in nasal epithelium and reaches the brainstem and thalamus via axonal transport through the olfactory pathway, making it an attractive candidate for OV therapy. Prior studies on chimerization of pathogenic virus-derived glycoprotein spikes with non-pathogenic strains exploit neurotropism of a wild-type virus while improving the safety profile of the resulting OV. We review, 1) the engineering of chimeric OVs used in the treatment of HGG; 2) potential for a novel chimeric virotherapy in which the SARS-CoV-2 glycoprotein spike can be used to deliver OV therapy intranasally; and 3) areas which warrant further investigation to develop this approach for clinical use. **METHODS:** We