

OTHER NEUROSURGERY

P.086

Unusual case of Aspergillosis presenting as a skull base lesion*V Pai (Toronto)* L Alshafai (Toronto)*

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Background: Fungi are ubiquitous microorganisms. Sinonasal fungal infections range from an acute fulminant to a chronic indolent clinical course. Fungal infections are common in immunocompromised patients, diabetics, and those with hematological malignancies. We present an unusual case of chronic invasive fungal sinusitis presenting as an anterior skull base lesion. Methods: A 42-year-old patient was referred with a history of right-sided proptosis. Prompt CT and MR imaging revealed a large right sinonasal erosive mass, predominantly T2 hypointense with heterogeneous enhancement. It extended into the right anterior skull base and invaded the right frontal lobe. The mass also invaded into the right extra-conal orbital fat, right pterygopalatine fossa, and right sphenopalatine foramen. Results: In view of the imaging findings, a biopsy was performed which confirmed fungal elements and chronic inflammation. Subsequently, a right-sided endoscopic endonasal resection of the sinonasal mass with resection of the right orbital component and debulking of the anterior skull base component was performed. Culture specimen grew aspergillosis. Conclusions: Extra-sinus invasion in fungal sinusitis is not uncommon. These cases may mimic other pathologies, e.g., tumors, with potential delay in treatment. Sound knowledge of the imaging appearances of this entity is imperative to ensure a good outcome.

SPINE AND PERIPHERAL NERVE SURGERY

P.087

Early and late exercise intervention after lumbar microdiscectomy reduces low back pain, fear avoidance, and improve neurodynamic mobility*L LeBlanc (Ottawa) ID Moldovan (Ottawa) R Ochoa-Sanchez (Ottawa) E Sabri (Ottawa) P Phan (Ottawa) C Agbi (Ottawa) S Mohammed (Ottawa) F AlKherayf (Ottawa)**

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Background: Exercise is commonly recommended to patients following a lumbar microdiscectomy although controversy remains as to the timing and protocols for exercise intervention (early vs late intervention). Our study aimed to evaluate low back pain level, fear avoidance, neurodynamic mobility, and function after early versus later exercise intervention following a unilateral lumbar microdiscectomy. Methods: Forty patients who underwent unilateral lumbar microdiscectomy were randomly allocated to early (Group-1) or later (Group-2) exercise intervention group. The low back pain and fear avoidance were evaluated using Oswestry Low Back Pain Disability Questionnaire, Numeric Pain Rating Scale, and Fear-Avoidance Beliefs Questionnaire. The

neurodynamic mobility and function were recorded with Dualer Pro IQ Inclinometer, 50-foot walk test, and Patient-Specific Functional Scale. Measurements were performed before surgery and post-surgery (1-2, 4-6, and 8-10 weeks) after exercise intervention. Results: Both groups showed a significant decrease in low back pain levels and fear avoidance as well as a significant improvement in neurodynamic mobility and function at 4 and 8 weeks post-surgery. No significant difference was detected between the two groups. Conclusions: These findings showed that early exercise intervention after lumbar microdiscectomy is safe and may reduce the low back pain, decrease fear avoidance, and improve neurodynamic mobility and function.

NEURORADIOLOGY (CSNR)

NEUROIMAGING

P.088

Computed tomography angiography for diagnosis of brain death; a technical review*A Aziz Rizk (Ottawa)* JJ Shankar (Winnipeg)*

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Background: Brain death is defined as an irreversible cessation of all brain activity. Ancillary tests are an objective way to support an initial diagnosis of brain death. Computed tomography angiography (CTA) is an imaging modality utilized as an ancillary mean to assist clinicians with such diagnosis. Different criteria and scoring systems have been proposed, however clear criteria are yet to be recognized to demonstrate full brain circulatory arrest. We aim to discuss different scoring systems presented in the literature and make evidence-based recommendations. Methods: A literature search using titles and key terms was conducted for articles containing brain death ancillary testing diagnosis, and CTA as primary focus. Results: CTA has the benefits of being non-invasive, fast, readily and widely available and it is especially useful in unstable patients. It is essential, however, to confirm intravascular injection of contrast injection by checking opacification of External Carotid Artery branches on CTA to prevent false diagnoses. Conclusions: When faced with the challenging decision to declare brain death in a patient, radiologists often face great apprehension and concern for the large responsibility bestowed upon them. It is critical for radiologist to understand that the final diagnosis of brain death is based on clinical criteria.

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A literature search using titles and key terms was conducted for articles containing brain death ancillary testing diagnosis, and CTP as primary focus*A Aziz Rizk (Ottawa)* N Farhani (Winnipeg) JJ Shankar (Winnipeg)*

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Background: Ancillary testing assist in the diagnosis of brain death. While traditionally, lack of blood flow (BF) in the

intracranial arteries constitutes conclusive evidence that the brain is dead, there is apparent discrepancy between the BF, and sufficient cerebral perfusion; In 15% of patients with confirmed clinical diagnosis of brain death, BF is still preserved. In these patients, cerebral perfusion is significantly impaired suggesting that cerebral perfusion rather than BF more accurately assesses brain function. We aim to present a history of brain death, its pathophysiology, and ancillary tests utilized for its diagnosis—specifically CT Perfusion studies. Methods: A literature search using titles and key terms was conducted for articles containing brain death ancillary testing diagnosis, and CTP as primary focus. Results: Across selected studies, CTP diagnosed brain death with 100% positive predictive value, as none of the patients were proven not-dead on follow-up. The early prediction of mortality outcome in these patients with proven high mortality rate may help decisions for withdrawal of life support. It may also facilitate procurement of organs for transplants. Conclusions: Although clinical assessment is the gold standard method of brain death determination, CTP has shown promising results that could alter our current clinical approach.

NEUROSURGERY (CNSS) FUNCTIONAL NEUROSURGERY AND PAIN

P.095

Functional neuroimaging signatures associated with analgesic effects of neuromodulation for chronic pain and their value in predicting treatment outcome

*L Boone (St John's) T Noble (St John's) A El Helou (Moncton)**
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Background: Responses to invasive neuromodulation therapy for chronic pain are highly variable after several months of sustained treatment, with some experiencing a complete loss of therapeutic effect. We sought to assess whether functional neuroimaging can provide a biomarker for treatment success and whether these biomarkers offer value in predicting treatment response. Methods: We searched Ovid MEDLINE and EMBASE from 1967 to 2022, including prospective studies correlating functional neuroimaging signatures with treatment response after surgical implantation. Results: After considering 355 studies for initial review, 22 studies were included. While there was significant heterogeneity in experimental design, preliminary findings suggest that differential regional cortical activation profiles and signatures can be employed to differentiate good from poor therapeutic responders. Three studies correlated pre-operative functional imaging with treatment effects post-implantation. For example, baseline activation patterns of specific brain regions on functional imaging modalities such as ¹¹C-diprenorphrine PET and Tc-99m-SPECT significantly correlated with therapeutic response to motor cortex stimulation, and spinal cord stimulation (SCS), respectively. Conclusions: The included studies demonstrate the potential for functional imaging to predict the likelihood of successful neuromodulation treatment. The concept is

relatively unexplored in the literature and could benefit from more studies with larger sample sizes to confirm clinical utility.

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Effectiveness of palliative focal resective surgery in intracranial EEG confirmed multifocal intractable epilepsy in adult patients

G Tamura (Calgary) S Wiebe (Calgary) C Josephson (Calgary) A Salmon (Calgary) S Singh (Calgary) W Hader (Calgary)*
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Background: Effectiveness of “palliative resections” of a dominant epileptogenic focus in adults with multifocal intractable epilepsy confirmed on intracranial EEG has rarely been reported. Methods: We retrospectively reviewed our database to identify patients who underwent focal resection after confirmation of multiple seizure foci on intracranial EEG. Results of presurgical investigations, intracranial EEG, procedures, complications and outcome were collected. Results: A total of 17 patients underwent palliative resection (8 left, 9 right). Preoperative MRI revealed malformations of cortical development in 6 patients, and MTS in 6 patients. Intracranial stereo EEG revealed 8 bilateral and 9 unilateral multifocal epileptogenic foci. Surgical procedures included anterior temporal lobectomy (ATL) or selective amygdalohippocampectomy in 4 patients, ATL plus additional cortical resection in 7 patients, and extratemporal resection in 6 patients. One patient had dysphasia post ATL and a second patient had worsened cognitive dysfunction post extended frontal lobectomy. Favorable seizure outcome (Engel class I and II) was achieved in 10 patients (58.8%). Pathology revealed focal cortical dysplasia in 6 patients and hippocampal sclerosis in 5 patients. Conclusions: Palliative resection of a dominant epileptogenic focus confirmed by intracranial EEG is effective in carefully selected adult cases of intractable epilepsy, particularly in patients with lesional epilepsy.

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Effect of stimulation site on brain network activity and phonemic verbal fluency: an fMRI study.

B Santyr (Toronto) M Cohn (Toronto) J Germann (Toronto) A Ajala (Niskayuna) J Qiu (Niskayuna) A Boutet (Toronto) A Lozano (Toronto)*

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Background: In Parkinson's disease, deep brain stimulation (DBS) of the subthalamic nucleus (STN) or globus pallidus internus (GPI) produces comparable motor benefits. Although both increases the risk of cognition and verbal fluency (VF) decline, the risk is greater following STN-DBS. The consequences of stimulating these different sites on brain network activity is unknown. We use functional magnetic resonance imaging (fMRI) during in vivo stimulation to investigate differences between STN-DBS and GPI-DBS and correlate with change in VF. Methods: Left-sided, stimulation-cycling block-design fMRI was acquired at 3-Tesla in 51 STN-DBS and 15