

SURG-19. COMPLETE RESOLUTION OF ADHD AFTER GROSS TOTAL RESECTION OF DYSEMBRYOPLASTIC NEUROEPITHELIAL TUMOR

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A 3-year-old boy with a history of attention-deficit/hyperactivity disorder (ADHD) presented a single focal tonic seizure. A thorough physical examination revealed no neurological deficit. A contrast enhanced MRI showed an isointense lesion in the anterior part of the cingulate gyrus extending through the left frontal lobe. After initial evaluation, the parents refused surgical treatment and a close follow up was then considered. At the age of five, the ADHD became more evident and the patient was started on methylphenidate. Poor clinical response was seen with the initiation of stimulant. The boy presented a second generalized seizure and the parents agreed surgical management. An interhemispheric approach was then performed and a gross total resection was achieved. The histopathological diagnosis corresponded to a dysembryoplastic neuroepithelial tumor (DNET). Four years after the resection, the patient is seizure free and the ADHD has also resolved without the need of medication. The disappearance of seizures is common after surgical resection of DNET tumors, but this case establishes an association with ADHD.

SURG-20. DIENCEPHALIC SYNDROME IN PEDIATRIC NEUROSURGERY

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This report details the histories of twelve patients with clinical diencephalic syndrome who collectively demonstrate the variability found in the syndrome with respect to: (1) clinical course, (2) site of the tumor, and (3) ease of obtaining radiologic confirmation of the presence of a tumor. Timely diagnosis of diencephalic syndrome is not often the case for patients presenting with failure to thrive (FTT) because of its rarity and lack of specific symptoms. These cases illustrate the importance of cranial imaging and consideration of diencephalic syndrome for children presenting with FTT despite normal or increased caloric intake.

SURG-21. ENDO- AND EXOSCOPIC SURGERY FOR PEDIATRIC NEUROSURGICAL OPERATION

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INTRODUCTION: Recently endo- and exoscopic surgeries have been gradually performed in neurosurgery. To improve the accuracy and safety of our endoscopic procedures, we are currently trialing 4K or 8K systems. Here we report our experience of endo- and exoscopic procedures for pediatric neurosurgery. **METHODS:** We retrospectively identified 22 patients (15 males, 7 females; mean age, 9.2 years) who underwent surgery for sellar lesions and intraventricular or intraparenchymal lesions with an endo- or exoscopic procedure at our institute between 2010 and 2020. We used a full HD endoscope system (Storz) and an organic electroluminescence (EL) monitor (Sony), and a 4K system (Sony and Olympus). VITOM 3D (Storz) was used as the exoscope. Videoscope (Olympus) was used as a flexible scope for intraventricular tumors. **RESULTS:** We performed surgical procedures as 11 biopsies, 6 third ventriculostomies, 5 resections, and 3 fenestrations. The full HD system with organic EL monitor presented high color contrast. We could easily distinguish between tumor microstructure and the normal structure with the 4K system comparing to full HD. Moreover, electronic zoom function enabled us to discriminate tumor boundaries without having to move the endoscope closer. As a result, we could delineate the surgical working space. VITOM 3D was simple to sharpen the focus on the wider surgical field, similar to the application of an operating microscope. **CONCLUSION:** In pediatric neurosurgery, an endo- or exoscope enables clear visual recognition of a boundary between tumor and normal area.

SURG-22. CERVICAL SPINE ANEURYSMAL BONE CYST OF A PEDIATRIC PATIENT

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BACKGROUND: Aneurysmal bone cysts (ABCs) are benign, expanding lesions that represent 15% of all primary spine tumors, and only 2% have

been found at the cervical level. There are different therapeutic options; the most successful is complete surgical resection. Although not always possible, due to high blood loss that occurs during the procedure, a combination of surgery with other treatment modalities was used in 40% of the cases reported so far. We describe a pediatric patient that we managed with embolization plus surgery. **CASE REPORT:** A 5-year-old girl presented with painful torticollis associated with a left posterior cervical mass, without neurological impairment. Magnetic resonance imaging of the cervical spine showed a multiseptated bony lesion with multiple fluid levels, involving the posterior elements of C2, associated with diffuse soft tissue enhancement of the left paravertebral muscles. We proposed a multi-staged treatment with pre-operative arterial embolization followed by the posterior surgical approach. Super selective embolization of the left ascending cervical artery was performed. The right ascending cervical artery also contributed to the tumor blush, but due to its connection to the right vertebral artery and, therefore, associated with a high risk of neurological injury, we prefer not to embolize it. Two days later, we performed a posterior surgical approach, with a gross total resection of the tumor. Histological examination revealed an ABC. **CONCLUSION:** An aneurysmal bone cyst is a rare cervical spine lesion that demands a multidisciplinary approach due to its locally aggressive behavior and the excessive blood loss related to surgery.

SURG-24. NOVEL MALLEABLE FORCIPES FOR ENDOSCOPIC ASSISTED TECHNIQUE IN PEDIATRIC BRAIN TUMORS

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Recent advances in optical devices and surgical instruments have been applied to neurosurgery. Even with modifications, one of the most serious risks is injury of neuronal and vascular structure caused by operation of surgical instruments in a narrow surgical field. Fixed instruments are not practical for pediatric brain tumor surgeries because the length of the curved or angled tip portion is limited because of the narrow entrance. We developed a novel malleable forceps to resolve the difficulties related to microsurgical procedures. The malleable forceps has two shafts with a sharp cup at the tip. The entire forceps was made of stainless steel, with a silver and nickel alloy inserted between 10 and 40 mm from the tip. In the alloy part, the surgeon can flex the forceps freely using a special cylinder. The special cylinder is useful to prevent from slipping of the cups of tip. The maximum angle that can be bent is 70 degrees vertically. We also developed a monoshaft malleable forceps. We used these flexible forceps in the case of various pediatric brain tumors including craniopharyngioma. We performed tumor resection by anterior interhemispheric trans-lamina terminalis approach. After procedure of tumor resection using microscope, endoscope inserted around the pituitary stalk. The piece of calcified tumor could be easily removed without any complications. These forceps can be deformed to an appropriate angle and can be applied to various cases, especially pediatric brain tumors.

SURG-29. A SINGLE CENTRE EXPERIENCE OF USING INTRA-OPERATIVE MRI IN MANAGING PEDIATRIC CRANIAL NEURO-ONCOLOGY CASES

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The University of Malaya Medical Centre, Kuala Lumpur had acquired an intraoperative MRI (iMRI) brain suite via a public private initiative in September 2015. The MRI brain suite has a SIEMENS 1.5T system with NORAS coil system and NORAS head clamps in a two room solution. We would like to retrospectively review the cranial paediatric neuro-oncology cases that had surgery in this facility from September 2015 till December 2019. We would like to discuss our experience with regard to the clear benefits and the challenges in using such technology to aid in the surgery. The challenges include the physical setting up the paediatric case preoperatively, the preparation and performing the intraoperative scan, the interpretation of intraoperative images and making a decision and the utilisation of the new MRI data set to assist in the navigation to locate the residue safely. Also discuss the utility of the intraoperative images in the decision of subsequent adjuvant management. The use of iMRI also has other technical challenges such as ensuring the perimeter around the patient is free of ferromagnetic material, the process of transfer of the patient to the scanner and as a consequence increased duration of the surgery. **CONCLUSION:** Many elements in the use of iMRI has a learning curve and it improves with exposure and experience. In some areas only a high level of vigilance and SOP (Standard operating procedure) is required to minimize mishaps. Currently, the iMRI gives the best means of determining extent of resection before concluding the surgery.