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ABSTRACTS

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Current treatment of Thalamic Tumors in Children and comparison with previous case series from our institution

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OBJECTIVE: To describe a case series of children with thalamic tumors treated at our institution and to compare findings with a previous case series from our institution published in 1997.
MATERIAL AND METHOD: A retrospective and observational study was performed. The records of 15 patients between 2013 and 2018 were analyzed.
RESULTS: From 2013 to 2018 15 patients were treated at our institution. The male/female index was 1.5, the mean age was 8.9. Seven (46%) tumors were left-sided, seven (46%) were right-sided and one (6%) was bilateral. All patients were symptomatic at the time of treatment. Motor deficit was the most common form of presentation 73% (11). Complete exeresis was performed in two (13%) patients, subtotal exeresis was performed in two other patients (13%) and for the rest of the patients (73.33%) the chosen surgical approach was stereotactic guided biopsy. The average of procedures was 3.4, mostly related to the treatment for hydrocephalus. Twelve patients (80%) received treatment for hydrocephalus. Nine patients (75%) were treated with ventriculoperitoneal shunts, four patients (33%) underwent third endoscopic ventriculostomy. High-grade tumors predominated. Grade IV tumors were diagnosed in six patients (40%), followed by grade III in four patients (26,6%), grade II in three (20%), patients and grade I in two (13,3%) patients. Chemotherapy was employed in 93% of the cases being Temozolomide the most used drug. The survival rate was 1.7 years.
DISCUSSION: Nowadays thalamic tumors need to be addressed in a multidisciplinary way in order to offer the best possible survival rate to the patient. Comparing these results with the series published by this institution in 1997, the predominant procedure changed, being stereotactic biopsy in the last five years with 73.33% of the cases whereas subtotal exeresis was performed in 1997 in 38% of the cases. Also chemotherapy was employed in 93% of the cases against 73% in the previous series, being Vincristine the only chemotherapeutic drug used then. The survival was higher in the last 5 years (1.7 years) than the previously reported in 1997 (0.96 years).
CONCLUSION: The clinical and surgical approach for the thalamic tumors in children changed over time in the literature. At our institution, the lesser invasive surgical approach is now used more frequently, and improvement in survival is evident.

Keywords: Thalamic tumors; stereotactic biopsy; temozolomide;

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Paramedian infratentorial supracerebellar approach for expansive processes in the pineal region on pediatric population

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OBJECTIVE: The surgical approach to lesions on the pineal region is one of extreme complexity due to the depth of such tumors and their surrounding critical neurovascular structures. Surgical access to the pineal region may often be performed through three ways: infratentorial supracerebellar (Krause), transtentorial suboccipital (Poppen) and posterior interhemispheric transcallosal (Dandy). Such approaches may result in unintentional complications. In order to avoid them, the infratentorial supracerebellar approach has been used as an effective alternative treatment to some patients. First described by Aboul-Enein, it enables the reach and transit on the pineal region clear of callibrous veins that perform key draining, which occurs when infratentorial supracerebelar approach with paramedian expansion is used. [1,2].
MATERIALS AND METHODS/CASUISTRY: A retrospective analysis of five cases from 2014 to 2018 where patients were submitted to a resection of expansive legions on the pineal region using this approach was performed.
RESULTS: Supracerebellar infratentorial approach with paramedian expansion was used on three boys and two girls aged 8.5 years on average (3-14 years interval). Initial symptoms were headache, vomiting, Parinaud syndrome, diplopia, gait abnormality, muscle weakness, lag in development among others. No complications related to the procedure were observed. Average time of hospital stay was 8.4 days. Tumor classes and types included one level-1astrocytoma, one germinome, one cavernoma, one diffuse glioma and one medulloblastoma. Mean time of

follow-up of such patients was 11.5 months. Ventricular derivation was necessary for 75% of patients. Evident neurological improvement was observed in all five patients.
DISCUSSION AND CONCLUSIONS: The approach of lesions in the pineal region through such method presents a viable and considerable option on resection of such tumors with reasonable and low-morbidity pathway. The authors' experience with pediatric patients shows that full resection on this region is both viable and safe, and represents a great alternative by minimizing risk of venous thrombose by coagulation of callibrous veins present in the midsection.

Keywords: Pineal; Approach; Pediatric tumor

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Surgical Approaches to the Pineal Region: Evolution in Time

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OBJECTIVE: To describe the approaches used to manage tumors located in the pineal region, and their modifications in the last thirty years in our institution.
MATERIAL AND METHODS: Case records, neurosurgical and oncological records of our service from the period January 1988 - January 2018 were reviewed retrospectively . A statistical analysis was used to evaluate trends in the approaches, and then compared to those reported in the literature.
RESULTS: Ninety nine patients undergoing surgery for tumors of the pineal region were included. The prevalence was higher among males 75.24% and 9.32 was the average age. Twelve patients died. Of the 143 surgeries performed: 66 were microscopic, 49 endoscopic, 6 stereotactic and 22 reinterventions for tumor recurrence (average: 2.95). Neuronavigation was used in six cases only. Stand alon or combined procedures were used strategically (more than one surgical technique) in this series since 2002: 49 third ventriculostomy (ETV) with pineal endoscopic biopsy and 66 microscopically: 6 lateral occipital transtentorial (OTT), 49 occipito-parietal transtentorial (OPT), 3 interhemispheric transcallosal posterior (ITCP), 4 supracerebellar infratentorial (SCIT), 4 transcortical transventricular (TCTV). The information was analyzed in quinquennial groups (5 years each); 100% of conventional approaches (microscopic) fell to 18.18% at the end of the curve, and the minimally invasive (endoscopic, stereotactic) rise exponentially (81.81%). Only 34 patients required a ventriculoperitoneal shunt; 25% had previous ETV. The pathology results evidenced the most common tumors were: pineoblastoma (31%), germinomas (18.2%), malignant gliomas (4.5%) and pineocitomas (4.5%) and others.
DISCUSSION/ CONCLUSIONS**:** The sampling and / or removal of pineal tumors is optimized by the use of minimally invasive surgical corridors [1], leaving the most extensive surgeries in disuse.
Contrary to other results [2] the post-operative complication rate was significantly related to the type of technique and number of reinterventions. Conventional approaches are today not so widely used due to the advances achieved in neurosurgery favoring the increasingly exponential use of the endoscopic approach for the diagnosis and management of tumors in the pineal region [3].

Keywords: Endoscopy, biopsy, conventional, pineal region.

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Transumbilical approach for ventriculoperitoneal shunts: experience in a brazilian pediatric neurosurgery service

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OBJECTIVE: Ventriculoperitoneal (VP) shunts are the main hydrocephalus surgical treatment in pediatric patients, with peritoneal cavity the most often distal catheter place[1]. Placement technique varies. Better cosmetic peritoneal approachs are important especially in children, reducind scars on exposed area such abdominal wall, without more complications [2,3]. The aim was to demonstrate the experience in a brazilian pediatric neurosurgery service in peritoneal catheter placement per median and paramedian no laparoscopic technique and evolution in 06 months.
MATERIAL AND METHODS: from a hydrocephalus prospective database, this retrospective longitudinal study included all the children until 12 years old, from March 2014 – August 2018, treated with VP shunt, and peritoneal cateter placement with transumbilical paramedian (TUPM) (incision and approach through umbilicus edges) or median (TUM) (approach through umbilicus). Demographic and etiological hydrocephalus characteristics, surgical time in each technique; early and 06 months transumbilical complications (infections, abdominal wall hernias and wound dehiscenses) were analysed. Patients with previous meningitis and surgery for VP shunt review were excluded. All cases were operated by the same neurosurgeon.
RESULTS: 46 children were submitted for transumbilical VP shunt (22M/ 24F; 13,9 ± 34,5 months old [0,1 – 132]; 30 using a paramedian and 16 a median approach. Surgical time was faster 04 minutes in TUM (37,09 x 41,46 minutes). Indications for shunt were: neonatal posthemorrhagic from prematurity (03), tumoral obstrutive hydrocephalus (04), neonatal non haemorrhagic/ non infectious hydrocephalus (23), ventricular arteriovenous malformations bleeding (01), secondary to myelomeningocele (13) and aquedutal stenosis (02). There were in 06 months, four cases of meningitis and two cases of proximal obstruction, without any complicated cases related from transumbilical approachs – abdominal wall infections or hernias, neither wound dehiscenses.
CONCLUSIONS: despite a secondary aspect in VP shunt treatment for children, an approach for cateter placement with good comestic outcome, must be encouraged, decreasing the hydrocephalus children stigmatization and better social and family acceptance.

Keywords: Ventriculoperitoneal shunt, Transumbilical approach, Minimally invasive Neurosurgery

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Achondroplasia: neurosurgical findings. Series of cases in a reference center

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OBJECTIVES: To describe the main neurosurgical complications in patients with achondroplasia as well as to establish the frequency and manifestations of craniocervical junction stenosis and hydrocephalus in patients followed up in a reference center between January 2015 and February 2019.
MATERIALS AND METHODS: Observational study of 39 patients, retrospective for the first two cases and prospective for the remaining 37 cases. The study was conducted to identify and analyze risk factors associated with craniocervical junction stenosis by compression of the foramen magnum and intracranial hypertension in the hydrocephalus. The data were collected through study-specific records filled during medical consultations in the neurosurgery clinic of the Instituto Fernandes Figueira/Fiocruz and through pacient records revision. Variables related to the diameter of foramen magnum and cerebral ventricles were analyzed in computerized tomography and magnetic resonance imaging, need for surgical decompression of the craniocervical junction or endoscopic third ventriculostomy, physical, neurological examination and factors related to family history.
RESULTS: Among the 39 patients in the study, ten underwent craniocervical decompression surgery after displaying signs of medullary suffering and alteration of tendon reflexes(1,2). We did not find a meaningful relationship between ventricular diameter and signs of hydrocephalus in the patients studied. Endoscopic third ventriculostomy was performed on one patient, successfully, that presented alterations of eye background with optic papilla edema, arterial hypertension, and convulsive crises.
DISCUSSION/CONCLUSIONS: Achondroplasia is caused by a mutation of the *FGFR3* gene and is one of the most common forms of skeletal dysplasia(3). Despite a limited sample of 39 patients, findings were compatible with the literature. The most frequent neurosurgical complications found in patients with achondroplasia in this case series were craniocervical junction stenosis in 25.6% of cases and hydrocephalus at 2,5%. The diameter of the foramen magnum was directly related to the symptoms of spinal cord compression in the patients of this series. The most frequent avoidable surgical complication was the accidental dural opening. Endoscopic third ventriculostomy was performed on a single patient and we observed ventricular diameter should not be used as a parameter for indication of ventricular shunt surgery in these patients because most of those presents macrocephaly due to ventriculomegaly.

Keywords: Achondroplasia, Hydrocephalus, Foramen Magnum Stenosis.

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VENOUS ABNORMALITIES IN PARIETAL AND OCCIPITAL CEPHALOCELES

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OBJECTIVE: Our study investigates posterior, parietal and occipital cephaloceles, with an emphasis on venous anomalies, deepening the knowledge in the area, through the systematic analysis of these patients by neuroimaging, aiming to standardize these venous changes according to type of encephalocele.
MATERIALS AND METHODS: There were selected children with posterior, parietal and occipital cephaloceles, born in the Maternity School Assis Chateaubriand (MEAC) of the Federal University Hospital of Ceará, during January 2017 to November 2018. The methodology used was the consultation of images, histopathological analyzes and medical records. The images were evaluated in order to standardize the venous abnormalities in each type of cephalocele. At the same time, data related to other encephalic abnormalities were evaluated, such as hydrocephalus, microcephaly, agenesis / dysgenesis of the corpus callosum, malformations of cortical develepoment, other alterations of the brain parenchyma and alterations of the posterior fossa.
RESULTS: The series of cases included 8 patients with posterior localization, mainly occipital and / or parietal cephaloceles. The most frequently associated anomalies found in this study were dysgenesis of the corpus callosum (100%), hydrocephalus (50%), microcephaly (12.5%), dysgenesis / stenogenesis (37.5%), posterior fossa malformations (62,5%). The venous alterations were bifurcation of the superior sagittal sinus (50%), hypoplasia of the sinus rectum (50%) and Herophilus's Torcula absent or in anomalous position. In one of the patients, there was a herniation of a wide venous structure, in this case the occipital sinus, into the hernia sac.
DISCUSSION: Cephaloceles are rare neurodevelopmental lesions. The anterior and posterior cephaloceles present significantly different signs, symptoms, and surgical considerations, but share common management goals: deformity correction, dural closure, and preservation of functional neurovascular elements.
CONCLUSION: The attempt to sequence a probable pattern of venous alteration through neuroimaging was proposed in this study, so that the communication between neuroimaging findings and preoperative management and a surgical planning are facilitated, thus helping to preserve the noble structures, improving the patient's prognosis.

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Analysis of the neurofunctional improvement of spastic children with cerebral palsy submitted to selective lumbar dorsal rhizotomy.

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OBJECTIVE: To analyze quantitative neurofunctional parameters to demonstrate the clinical improvement of spastic children with cerebral palsy (CP) submitted to selective lumbar dorsal rhizotomy (SLDR).
MATERIALS AND METHODS: A total of 28 children with CP, evaluated by the multidisciplinary team of the Integrated Rehabilitation Center (CEIR, Tersina-PI), underwent SLDR, at the Hospital Infantil Lucidio Portela (HILP, Teresina-PI), for the treatment of spasticity, obeying the following protocol: neurofunctional evaluation (pre, intra and sixth postoperative months), intraoperative neurophysiological monitoring, physical rehabilitation after surgery (specific protocol) and interdisciplinary follow-up (neurosurgery, neurology, orthopedics, physiotherapy and occupational therapy), through (GMFCS, Modified Ashworth, Goniometry, GMFM, PMAL and MACS).
RESULTS: According to the data analysis, the majority of the patients are at functional levels III, IV and V of the GMFCS scale, and some with acquired joint deformities, demonstrated by goniometry under sedation, reflecting the severity of their motor alterations and determining the limits of the objectives. Even after SLDR, a significant reduction of the values measured by the Modified Ashworth scale was observed, reflecting the increase in the A, B and C domains of the GMFM scale.
DISCUSSION AND CONCLUSIONS: In recent years there has been an exponential increase in the number of scientific publications on therapeutic interventions in spastic children with CP. Approximately 70% of these therapies had little or no effective clinical outcome, with botulinum toxin, diazepam and RDS being the most effective treatments for spasticity control. In this study, it can be observed that there was a measurable clinical improvement after SLDR, with results similar to those published in large international centers, revealing that the best functional outcome of these children is related to the harmonic utilization of the resources offered by the neurofunctional evaluation, physical rehabilitation and interdisciplinary follow-up.

Keywords: Cerebral Palsy, Spasticity, Selective Dorsal Rhizotomy.

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Aseptic catheter obstruction histology from pediatric hydrocephallum shunts: serial cases.

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OBJECTIVE: Analyze the histology of lump found inside proximal catheter from ventricular shunt and compare with patients´ data.
MATERIAL AND METHODS: 7 patients between 1 and 15 years old were submitted emergency ventricular shunt revision due to proximal catheter obstruction. We analyzed images and clinical data (Glascow scale, Pediatric Cerebral Performance Category – PCPC, cephalic perimeter, Evans index, laboratory tests). The histology analysis consisted of hematoxylin and eosin (HE), and immunohistochemistry of GFAP and CD68.
RESULTS: Patients were of both genders, all were committed of communicating hydrocephalus, 1st shunt were performed until one year old, the catheter time until obstruction varied between 1 and 3 years, total shunt revisions were between 0 and 3, tomographic images had indirect signs of intracranial hypertension, and deep catheter insertion. The Glasgow scales varied between 8 and 13, and PCPC between 2 and 4. All patients had good clinical evolution. Histology demonstrated normal choroid plexus in 5/7 patients, we observed one tissue with mixed inflammation (1/7), and other lump tissue with white substance cerebral with focal multinucleated giant cells (1/7). We found microglia/macrophages in all fragments (confirmed by CD68).
DISCUSSION/CONCLUSIONS: in literature, we have few studies about aseptic proximal obstruction shunts. The catheter hole allowed nidation of choroid plexus and inflammatory cells. The catheter material seems supporting nervous tissues, such white substance, choroid plexus and immune cells [1]. To avoid that kind of obstruction, we believe that more indication of third ventriculostomyia-endoscopic (non-communicating hydrocephalus), programmed shunts revision, insertion of proximal catheters with ultrasonography, avoiding deep catheter positioning, others catheters could be used (impregnation of antibiotics or silver, different designate for liquor flow, intelligent valves) [2].

Keywords: Hydrocephalus, Pediatric, Ventricular shunt, Obstruction.

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Anatomopathological aspects of tonsils of children with type I chiari malformation

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OBJECT: The purpose of this study was to analyze the main histological aspects of cerebellar tonsils in children with Type I Chiari Malformation who underwent subpial aspiration. Thereby, we aimed to help clarify the natural history of this pathology, as well as to determine the prognosis of this population when treated with this technique, once the main studies in this subject have been done with adults.

MATERIAL AND METHODS: We analyzed the anatomopathological reports of the tonsils removed with subpial aspiration technique, in several hospitals of João Pessoa, Brazil, from 5 children diagnosed with Type I Chiari. The findings were compared to those known to be observed in adults.
RESULTS: The slides of all tonsils showed the same histological changes: Bergmann gliosis, loss of Purkinje cells, atrophy of the cerebellar cortex and meningeal fibrosis.
DISCUSSION: The obtained results were similar to the ones found in previous studies carried out in adults by Koga (1995) and Pueyrredon (2006). Thus, the cerebellar anatomopathological alterations secondary to Type I Chiari Malformation, which leads to loss of tissue function, seem to appear early in life, suggesting the safety of the intrapial aspiration in pediatric patients.
CONCLUSION: However, more extensive studies and long-term follow-up of patients are needed to establish with more precision the natural history of the disease.

Keywords: Neurosurgery. Arnold-Chiari Malformation. Gliosis.

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Evaluation of Endoscopic Third Ventriculostomy in children with Chiari II after the first ventricle peritoneal shunt failure

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OBJECTIVE: Evaluate effectiveness and safety of Endoscopic Third Ventriculostomy (ETV) in children with Chiari II syndrome during the first ventricle peritoneal (VP) shunt failure.
MATERIAL AND METHODS: Were studied retrospectively patients with hydrocephalus secondary to Chiari II e submitted to ETV during the first failure of the VP shunt. The score for the ETV success prediction was obtained retrospectively for each patient and compared to the real success observed six months and one year after the procedure. Patients with other etiologies of hydrocephalus were excluded from this study. It was considered ETV success the improving of signs and symptoms of intracranial hypertension. The reduction of ventricular volume was not considered as a necessary sign to judge treatment success. Were used the software SPSS (Statistical Package for the Social Science) and Minitab. Was compared the real success of ETV after six months and one year with ETVSS prediction. Index of statistical significance of 5% was adopted.
RESULTS: Were selected 43 children. The age group of individuals analyzed ranged from one month old to 17 years old. The overall success rate of ETV in patients with previous VP shunt was 53,48% in six months and 41,86% in a year. The age group with the highest percentage of success was the one of those with 10 years old or more and demonstrated success rate of 76,92% in six months and 69,23% in a year. There was no mortality during the treatment.
DISCUSSION: The indication of ETV in patients with Chiari II syndrome is controversial due to anatomical difficulties related to the syndrome. However, due to the risk of valves infectious complications, the endoscopic technique has been shown as a viable alternative [1,2]. Those patients born with hydrocephalus are initially treated with ventricle peritoneal shunts. It is estimated that approximately half of the valves will fail in the first year of life and that this risk will remain, henceforth, at about 10% a year.
CONCLUSION: This study suggests that ETV is a safe technique and able of treating hydrocephalus even in patients with Chiari II previously considered valve dependent.

Keywords: Hydrocephalus; Endoscopic Third Ventriculostomy; Chiari II.

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Goniometric outcome of selective dorsal rhizotomy for the treatment of spastic diparesis in children

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INTRODUCTION: Selective Dorsal Rhizotomy (SDR) is an undisputable treatment option for spasticity caused by cerebral palsy (CP). Outcome after SDR is usually assessed by subjective scales and quality of life scores, but also by goniometry, which is the measurement of the total motion of a specific joint. It provides a quantitative analysis of SDR efficacy, and is commonly used on rehabilitation follow-up.
OBJECTIVES: To evaluate goniometric parameters of patients with CP that have undergone SDR in our service in order to assess post-operative outcome.
MATERIALS AND METHODS: The authors reviewed the medical charts of pediatric patients with CP associated spasticity treated by SDR between June 2010 and July 2017. Demographic data, number of spastic limbs, and pre-operative GMFCS levels were collected, along with goniometry of hip abduction, bilateral popliteal, and foot dorsiflexion angles prior to surgery and 6 months post-operatively.
RESULTS: 35 patients were included (19 males and 16 females; mean age 8,7 years). 13 (37,1%) had lower limb bilateral paresis, 10 (28,5%) triparesis and 14 (40%) tetraparesis. Pre-operative GMFCS distribution was: 1 level II, 7 level III, 16 level IV and 10 level V. Improvement of the hip abduction angle was seen in 84,6%, bilateral popliteal angle in in 69,2%, and foot dorsiflexion angle in 61,5%.
CONCLUSIONS: Goniometry is a reliable method for quantitative evaluation of the benefits of SDR, demonstrating its efficacy and correlating with other scores as a reliable outcome assessment tool. It is simple and therefore might be performed by all clinical members of the rehabilitation team involved in care of spastic patients.

Keywords: goniometry, selective dorsal rhizotomy, spasticity.

Causes of Hemorrhagic Stroke in Campina Grande-PB

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OBJECTIVE: To evaluate the causes of spontaneous hemorrhagic stroke in the patients of Campina Grande-PB.
MATERIAL AND METHODS: It is a descriptive, retrospective study with approach of 60 medical records of patients with 2 months to 15 years of age, admitted in a tertiary hospital at Campina Grande-PB, Brazil, which received non-traumatic diagnostic from January 2010 to December of 2018. The data were collected by a standardized medical record, organized in electronical spreadsheet.
RESULTS: The vascular malformations were the responsible for the largest number of patients with hemorrhagic stroke, with 23,33% (n=14). Brain aneurysm followed with 10% (n=6). Other causes were: coagulation disorder; after medication; vasculitis, making a total of 6,66% (n=4) of the individual cases registered. The ones happened after meningitis, brain tumors, systemic hypertension and sepsis counted with 5% each (n=3). Deep venous thrombosis, post-chemotherapy and related to leukemias counted with 3,33% each (n=2). Lastly, less frequent causes, however equally important, were: von Willebrand disease, hemophilia, lymphomas, liver insufficiency, lupus, thrombocytopenia and HIV, every with 1,66% (n=1).
DISCUSSION AND CONCLUSIONS: The obtained results in this survey confirm the most recent data in the literature, being the vascular malformations the most prevalent over the other causes. Some data in the literature points a frequency that goes from 38 to 74% of the brain hemorrhage in the children due to these malformations. Although the stroke in children is relatively rare when compared to the adults, is an important cause of death in this age group and permanent incapacity. A stroke suffered in the first decade may cause functional sequels for subsequent decades. An estimated incidence of stroke in children varies from 2 to 13 per 100.000 children per year in the developed world.

Keywords: Hemorrhagic stroke, Neurosurgery, Pediatrics.
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Epidemiological classification of neurosurgeries and study of neurosurgical reoperations performed at Hospital Infantil Albert Sabin (HIAS) during 2017 and 2018.

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OBJECTIVE: Show the first epidemiological survey of neurosurgeries performed in HIAS, concentrating on clinical-epidemiological characteristics and quantitative aspects of the procedures.
MATERIAL AND METHODS: Neurosurgeries' cross-sectional and retrospective study of 2017 and 2018. The data were obtained in surgical centers' records and analyzed in Excel according to the type of procedures, detach the five most frequent surgeries. The recurrences' number to surgical center was studied in general for neurosurgeries and specifically for hydrocephalus, peritoneal ventricular shunt and tumor.
RESULTS: Occurred 999 neurosurgeries, the most performed surgeries were peritoneal ventricular shunt - PVS - (28.4%), revision of PVS (19.6%), brain tumor (12.3%), PVS removal and external ventricular shunt placement - EVS - (9.9%), and placement of EVS (9%), respectively, following the pediatric neurosurgical services' model without trauma care [1]. Regarding the relation of the surgeries' number with the patients' amount, we observed an average of 2 operations per patient in the study of neurosurgeries in general and in the specific study for hydrocephalus, converging with the literature [2]. While the specific analysis of PVS and brain tumors showed an average of 1 surgery per patient, as well as in other studies [3]. The comparative analysis between the two years showed an increase in the probability of reoperation for hydrocephalus (18.3% to 21%) and tumor (8.3% to 11%), with reduction of PVS reoperations (13.4% to 10%), showing a favorably tendency of reduction in the need for PVS surgeries' reoperation.
DISCUSSION/CONCLUSIONS: The service is compatible with the transition from a model concentration in low complexity procedures, such as shunts for hydrocephalus, for a high complexity service. The tendency is this transition continues and envolve positively because the hospital has all forms of human and technological resources for complex surgeries of brain tumors and congenital malformations, including neuroendoscopic procedures.

Keywords: Hydrocephalus, Brain Tumor, Reoperation.

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Combined transcranial-orbital approach for resection of unilateral intraorbital optic nerve glioma (ONG) in children: surgical technique and results.

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OBJECTIVE: Approximately 10% of all optic pathways gliomas are confined to the optic nerve. The vast majority is classified as benign pilocytic astrocytomas (WHO grade I). It is a surgical challenge to obtain a total removal without causing palpebral ptosis or ocular bulb atrophy

(1). Our aim is to describe the results and technique of a combined transcranial-orbital approach to remove ONG.
METHODS: From 1996 to 2017, 470 intracranial tumors were operated in children by the senior author (JWJB). Three children had unilateral intraorbital ONG. Presenting clinical manifestations were increasing unilateral proptosis and progressive visual loss without chiasmatic involvement. None of them had neurofibromatosis type I. Surgery was indicated only when vision was severely compromised. Technique consisted of frontal craniotomy with removal of the supraorbital ridge and orbital roof. Resection of entire optic nerve from ocular bulbus up to the optic canal was performed without sectioning any intraorbital muscle or the annulus of Zinn. The approach to the optic nerve inside the orbit was medial to the levator palpebrae muscle to avoid lesioning its oculomotor branch.
RESULTS: Two boys (7 and 8 years old) and one girl (9 years old) had combined transcranial-orbital approach. Two were exclusively extradural and one had an intradural section of the optic nerve just after entering intracranial space. In one patient ultrasonic aspirator was used for tumor debulking in order to obtain space for optic nerve sectioning. Bone fixation was done with wires in one patient and resorbable plates were used in 2 patients. No complications were seen. There was no ptosis palpebrae and no phthisis bulbi (atrophic scarred globe). All 3 had good cosmetic result. No tumor recurrence occurred with a follow-up period of 18 years, 5 years and 1 year.
CONCLUSION**:** Combined transcranial-orbital approach is safe and effective for removing ONG in children.

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Complications in the treatment of fetal myelomeningocele

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OBJETIVE: To analyze the obstetric, neurosurgical and institutional complications related to the treatment of fetal myelomeningocele.
MATERIALS AND METHODS: We analyzed 35 procedures performed at the Hospital das Clínicas of the Medical School of the University of São Paulo related to the treatment of fetal myelomeningocele. The gestational age of the surgery ranged from 21 to 26 weeks of gestation. All fetuses presented sonographic signs of Chiari type II. The level of the lesion ranged from T12 to S1. Complications related to the procedures were analyzed.
RESULTS: The obstetric complications were: 2 bleeding hysterotomy, 2 fetal bradycardias with 1 fetal death, 4 operative wound dehiscences, 3 uterine atony, 3 chorioamionite, 1 acute maternal lung edema, 1 maternal intestinal injury, 13 premature membrane ruptures, 5 premature births below 30 weeks of gestation. The neurosurgical complications were: placode contusion visualization in 5 cases, 1 postnatal bulging in the site of myelomeningocele suture, 1 case of Chiari type II postnatal symptoms, 9 cases with large defects and difficulty close the skin, 7 cases of ventriculoperitoneal shunt (21%) and one case of postoperative ventriculitis. The institutional complications were 3 births of procedures performed in another service.
CONCLUSIONS: The treatment of fetal myelomeningocele decreases the rate of ventriculoperitoneal shunting, however it presents obstetric, neurosurgical and institutional complications that need to be clarified to the pregnant

Keywords: Fetal myelomeningocele

Non syndromic combined craniosynostosis: assessment pitfalls and specific management issues

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OBJECTIVE: Familiarity with associated head shapes can allow bedside diagnosis of craniosynostosis. This is true considering single-sutural fusions, which are the most common presentation. Fusion of two sutures occurs with far less frequency and typically involves the right and left coronal sutures. However, sometimes, cranial dysmorphology is unfamiliar to even the most experienced clinician and CT scan is required to define the craniosynostosis type. The aim of this study is to describe a rare form of unclassified craniosynostosis and to determine its clinical and radiological characteristics and the surgical treatment and its challenges.
MATERIAL AND METHOD: Retrospective study of 3 cases of patients with non-syndromic combined craniosynostosis of uncommon phenotype. We analyzed the 3D CT scan, age at presentation, skull shape, signs of intracranial hypertension, genetic panels and surgical approach.
RESULTS: The 3 patients presented the rare early ipsilateral closure of the coronal and lambdoid sutures, determining atypical craniosynostoses. No genetic mutations were identified. All cases were identified from CT scan due to balanced dysmorphism. All patients underwent 2-steps surgical correction.
DISCUSSION: The classification of craniosynostoses depends on the combination of some characteristics: 1) when the sutural disease is part of a syndrome; 2) patient's morphological appearance; 3) the sutures involved and 4) the progression of the disease. From these criteria, it is possible to classify most of the craniosynostoses(1). However, some patients with non-syndromic craniosynostosis present an uncommon and difficult classification phenotype, and investigation with CT scan is necessary to determine the early fusion of sutures(2).
CONCLUSION: Synostosis of two sutures is an objective and treatable condition with standardized techniques in the literature. However, children with combined craniosynostosis of unusual phenotype are difficult to diagnose and surgical treatment can be challenging. According to our knowledge, the ipsilateral fusion of the coronal and lambdoid sutures is rare, with only a number of cases described. This condition should be studied and treated early in order to avoid late diagnoses that may lead to cognitive impairment, sometimes irreversible.

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Children victims of social violence with traumatic brain injury: epidemiological and sociodemographic profile

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OBJECTIVE: To determine the epidemiological and sociodemographic profile of paediatric patients with traumatic brain injury (TBI) who were victims of social violence.
MATERIALS AND METHODS: A cross-sectional, descriptive study, carried out in 2018, through the analysis of medical records of paediatric patients diagnosed with TBI, victims of social violence admitted to the emergency room from September 2010 to December 2017 in a hospital located in Salvador, Brazil. Sociodemographic, epidemiological and trauma mechanisms variables were included in the analysis.
RESULTS: 487 patients were included in this study. During the study period, an average of 42 cases per month was observed, with a higher incidence of cases in the last four months of the year (31.8%) and with most cases (79 cases) registered in 2014. The following years showed a lower incidence of cases. We observed a higher proportion of cases in males (69.8%), between 10 and 17 years (65.5%), residents of Salvador, the state capital (88.1%). Trauma mechanism involved cold weapons (48.7%), physical force (40.5%) and firearms (10.9%). In this context, an association between TBI and domestic violence was observed in 10.3% of the cases. Regarding epidemiological and sociodemographic characteristics of the victims, in correlation to trauma mechanism, was observed that female patients suffered more aggressions due to physical force (46.9%) while male patients were injured by cold weapons (50.0%). Prevalence of trauma caused by cold weapon persisted in all age groups, whereas the main mechanism in the age group between 29 days to 2 years old was physical strength (66.7%). Those from Salvador were mostly victims of cold weapon injuries (51.1%), while physical force aggression was more predominant among residents of the metropolitan region (43.2%) and cities in the countryside (38.1%).
DISCUSSION / CONCLUSION: The study showed a predominance of TBI due to social violence in male adolescents who live in the capital of the state Bahia, with agression by cold weapon as the main mechanism of trauma. According to the results, which meet with similar studies [1,2], a focus on the evaluation and implementation of specific control and prevention strategies is appropriate, since the primary causes of TBI vary according to the population, in addition to the need of more studies related to the topic.

Keywords: traumatic brain injury, epidemiology, social violence.

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Decompressive craniectomy in children: single center experience and review of the literature.

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OBJECTIVE**:** The goal of this study was to review our cases of decompressive craniectomy (DC) in children with traumatic brain injury (TBI) focusing in mortality, outcome and psychological impairment, comparing the results with literature.
MATERIAL AND METHODS: A retrospective study was performed reviewing the medical data for TBI children who were submitted to DC between 2012 and 2015 at our institution. Epidemiological data, mechanism of injury, initial imagining, time until admission and craniectomy, presenting GCS score and hospital course, outcome, mortality and cognitive performance was evaluated. A literature review was carried out until June 2018, including reports of a total of 5 or more patients in the pediatric age group (< 18 years) undergoing decompressive craniectomy with a minimum follow-up of 1 month after the procedure.
RESULTS: 16 patients underwent DC for TBI at our institution, 62.5% were males and 37.2% females, mean age was 12 years-old, road traffic accident (RTA) was the main trauma mechanism (62.5%). Average Glasgow coma scale (GCS) was 5.2 with 31.2% of patients presenting pupillary mydriases. Initial cranial computed tomography (CT) showed skull fractures in 62.5% and acute subdural hemorrhage (ASH) in 56.3%. Mean ICP was 27.2 mmHg prior to surgery, mean time to surgery was 36.3 hours, unilateral DC was performed in 68.8% of patients. Mortality after six months was 37.5% and among survivors, Average Glasgow outcome scale (GOS) was 3.7, with good outcomes (GOS 4-5) in 70% of children. Psychological analysis of our surviving patients was abnormal in 55.6% of patients, aggressiveness was present in 22.2%, mild cognitive impairment in 22.2%, vegetative state in 22.2% and severe cognitive impairment in 11.1%.
DISCUSSION AND CONCLUSIONS**:** Although children have lower mortality and better outcomes in GOS comparing with adult patients, psychological sequels and their consequences need to be computed in prognosis evaluation.

Keywords: Decompressive craniectomy, Traumatic brain injury, Intracranial pressure, Outcome

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Development of a perioperative protocol in pediatric patients submitted to spinal deformity surgery

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OBJECTIVE: The perioperative care determine spinal deformity surgeries success, simple measures such as analgesic optimization, reduction of opioid usage and early ambulation have a great impact at patient outcome, specially during hospitalization [1]. We developed a protocol contemplating the perioperative in order to optimize postoperative analgesia, reduce ICU length of stay and hospitalization; in addition to enhance

postoperative performance in pediatric patients submitted to spinal deformity surgeries.
MATERIAL AND METHODS: The protocol can be divided in preoperative, intraoperative and postoperative. In the preoperative time we evaluate the nutritional status, pre-existing diseases, laboratory routine and the patient begin to use gabapentine. At the intraoperative time the patients is taken care by a trained anesthesiologist, antibiotic prophylaxis with cefazolin is the standard (and maintained 24h), hemoglobin must be > 8 mg/dl, evoked potential is used in all patients and at the end of the procedure intrathecal morphine or clonidine are used. In the postoperative time analgesy is maintained with nonsteroidal anti-inflammatory drugs, opiates and gabapentine; vasopressor if MAP < 60mmHg, the analgesic period is used to make the patient remain in orthostatic position at the first 12-18 hours, drains and vesical catheter are maintained at maximum 48 hours. Were included ambulatory patients, without cognitive dysfunction, submitted to spinal deformity by the posterior route (n=4). The control group was selected by the same criteria (n=26). Were excluded non-ambulatory patients and with cognitive dysfunction.
RESULTS: Mean age was 15 years old and the most incident disease was adolescent idiopathic scoliosis (56%). At the patients submitted to the protocol, the hospitalization was reduced by 20%, whilst ICU-stay reduced 42%. It was observed, also, a reduction at the necessity of opiates and at the final cost of the hospitalization.
DISCUSSION/CONCLUSION**:** The postoperative management of those patients carries the possibility of better performance and postoperative results [2], even though it lacks high-level evidence. Intrathecal analgesia and early ambulation tend to be the key to optimize the postoperative performance, which could be confirmed by preliminary result at the study. The perioperative protocol brings forward a significant impact at the relation cost-effectiveness of complex surgeries. The development of a prospective study will elevate the evidence with socioeconomic impact.

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Craniosynostosis: fighting the early fontanel closure mith.

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OBJECTIVES: The association between early fontanel closure (FC) and craniosynostosis can lead to confusion. Misdiagnosis of craniosynostosis or unnecessary referral of early FC can both be prejudicial for the patient. The present study aims to relate the clinical data of patients who had gone through craniosynostosis surgery to the knowledge of pediatrician and the average population about the relation between craniosynostosis and the early FC.
MATERIAL AND METHODS: This is a descriptive and transversal study in a quantitative approach. 172 questionnaire were applied (47 for pediatricians and 125 for parents of children with non neurological problem) in january 2019. Also, the hospital data were analyzed to detect, among the cirurgical cases of craniosynostosis, how many were a early close fontanelle case.
RESULTS: 78.7% of pediatricians affirm that there is association between craniosynostosis and early close of fontanelle. When asked about the consequences of early FC, 85.1% of pediatrician pointed changes in the growth of children's skull as a recurrent simptom. 88% of parents deny knowing craniosynostosis, yet they point early FC as a health problem. 63.8% of pediatrician considered early FC a condition that needs to be referred to a neurologist/neurosurgeon brevily. From the percentage of patients who had craniosynostosis surgery 47% had open fontanel.
DISCUSSION/ CONCLUSIONS: Although pediatricians know the most common age group in which anterior fontanel are closed, most of them believe that an early FC can lead to changes in skull growth, yet this is a misconception. Also a good part of pediatricians believes that the follow-up of early FC should be done by the neurologist/ neurosurgeon with brevity. Associating the data obtained through the interviews with the clinical data of the surgeries in Albert Sabin Hospital, this study observed the necessity to clarify the development of craniosynostosis, there for a better diagnosis can be done.

KEYWORDS: Craniosynostosis, Fontanel, Diagnosis

Occipital encephaloceles and anomalous venous outflow: non-coincident combination of a single embryonic event

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OBJECTIVE: Occipital encephalocele is relatively common. However, the development and anatomy of the venous sinuses in occipital and occipitoparietal encephaloceles is poorly understood. In this way, the objective of the study is to better understand the origin of this congenital event and its relation with the venous alterations found.
MATERIALS AND METHODS: Retrospective study was conducted to analyze radiological characteristics of patients with occipital and parieto-occipital encephaloceles referenced to the department of pediatric neurosurgery from January 2010 to January 2019. Only patients with venous angio-CT scan were included in this study. The following radiological characteristics were studied: lesion size and location, presence of ventricular dilation, presence of cerebral malformations, detailed anatomy of the venous sinuses and its relationship with the therapeutic decision.
RESULTS: We reviewed the radiological records of 33 children with occipital and parieto-occipital encephaloceles referenced to our unit from January 2010 to January 2019. Frequent radiological findings consisted of vertically positioned sinus, falcine sinus persistence, duplication / upper sagittal sinus. Other alterations consisted of elongated vein of Galen, corpus callosum agenesis, tentorium malformations, cerebellar vermis agenesis, hydrocephalus and heterotopias. In 3 cases, the presence of the torcula within the lesion contraindicated the surgical approach.
DISCUSSION AND CONCLUSIONS: The concomitant presence of occipital encephaloceles and morphological alterations of the straight sinus / persistence of the falcine sinus do not seem to coincide. This is because the presence of an occipital encephalocele interferes with the ventromedial part of the mesenchyme responsible for the formation of the tentorium and tentorial venous plexus. At this location, venous channels will not form and, consequently, the formation of a venous sinus from the sagittal plexus occurs, determining the falcine sinus, most frequently found in our study. The knowledge of these venous changes is of extreme importance to the neurosurgeon both for the therapeutic decision and for the planning of the surgical approach.

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Pediatric central nervous system tumors: a tertiary care center experience in Rio de Janeiro (2002-2012)

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OBJECTIVE: Brain tumors are the most common solid pediatric neoplasm, and the leading cause of malignancy-related death in children, comprising approximately 20% of all pediatric cancers. There are scanty reports on the epidemiology of pediatric central nervous system (CNS) tumors in Brazil. The objective of this study is to describe the epidemiological characteristics of pediatric CNS tumors in a brazilian cancer institute.
MATERIAL AND METHODS: *Retrospective cohort of 375 cases of CNS tumors in children under 18 years, admitted to INCA in the 2002-2012 period* The variables registred were sex, age at diagnosis, tumor location and pathology. Five age groups were arbitrarily defined: 0-2years, 3-5 years, 6-10 years, 11- 15 years and 16-18 years. Categorical variables were described in frequencies tables and percentages. Quantitative data were described as medians and standard deviation.. Data was analyzed using EPIINFO© 7.
RESULTS: Median age at diagnosis was 8 years, similar for boys and girls. Boys were more affected than girls (M/F ratio: 1.41). Supratentorial location was slightly more frequent than infratentorial location (49.3% versus 48.5%). Low grade gliomas were the most prevalent histology (33%), followed by medulloblastomas (24%) and ependymomas (11%). Pylocitic astrocytomas accounted for 78% of the low grade gliomas. Embrionary tumors accounted for 26% of all tumors (n:100) and medulloblastoma were the majority (89%).
DISCUSSION: Median age at diagnosis were similar to previous studies in Iran, South Korea and Canada. The prevalence of these tumors in boys also repeated previous studies. Regarding location, there is no consensus in literature about the most prevalent. Low grade gliomas were the most frequente histopathology, as described in other studies.
CONCLUSION: Our results were similar to other institutional studies. To describe epidemiological data from hospitalar-based registry in places where the population-based registries are not available is crucial for better diagnosing and planning the treatment of such morbid disease.

Closure of myelomeningocele defect using a keystone design perforator island flap

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OBJECTIVE: Early surgical repair of myelomeningocele (MMC) is recommended to reduce infection rates, but severe and large defects can preclude primary closure. Keystone design perforator island flap (KDPIF) is a plastic surgical technique that is effective for reconstruction of soft tissue defects, provides a very straightforward and effective skin cover, achieving excellent aesthetic results. The aim of this study is to review our experience handling large skin defects and to present our results with the KDPIF for closure large MMC.
MATERIAL AND METHODS: We report the clinical course of seven patients who underwent KDPIF for MMC repair at birth. There were two cases of kyphosis associated with MMC. Patients were selected by the neurosurgeons and plastic surgeons, when it was thought that primary closure would be difficult or even not feasible. The opposing sliding flaps were prepared, based on randomly located vascular perforator. Skin incisions were made on the outline of the flap and continued through the subcutaneous tissues down to lumbar fascia and muscles. Closure was performed in layers, and then the V-Y advancement of each end of the flap in the longitudinal axis is completed. After discharge, all patients were followed by both teams and long term follow-up with photography record was performed.
RESULTS: Wound healing was satisfactory, whit no recorded skin flap dehiscence or necrosis, infection and cerebrospinal fluid leak. One patient (14.3%) developed a severe neonatal sepsis that leaded to renal insufficiency and death. Five patients (71.4%) required a ventriculoperitoneal shunt after defect repair. Excellent aesthetic outcome was achieved during the follow-up. Additionally, one our patients had insufficient intra-utero closure of MMC requiring further surgery with large skin defect, successfully treated with KDPIF.
DISCUSSION/CONCLUSION: KDPIF technique is based on well known vascular musculo/fasciocutaneous perforators of the intercostal, lumbar and gluteal regions. The flap distributes wound tension widely and, consequently, provides significant tissue bulk, reliable vascularity and an important geometrical versatility. Another advantage is the preservation of most of the muscles and fascia, what is desirable to minimize morbidity secondary to local rearrangement, a real and important issue to prevent late deformities. KIDPF was used in two cases of kyphosis and showed to be very straightforward and effective. In conclusion, KDPIF showed to be a relatively simple, effective and safe technique to close large skin defects and its use in conjunction with plastic team can be the standard of care for postnatal repair of such defects.

Keywords: Spina bifida, Myelomeningocele, Perforator flap

Filum terminale lipomas in patients with anorectal anomalies: results of surgical treatment

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OBJECTIVE: The natural history of thetered cord in patients without other malformations is known and involves progressive neurological symptoms. However, the behavior of spinal lesions observed in patients with anorectal malformations remains uncertain. Caudal regression

syndrome and Currarino's syndrome clearly reflect neurological changes that can be anticipated. In contrast, most patients with anorectal anomalies do not present the same neurological consequences or present moderate associated sacral dysplasia. The aim of this study is to evaluate the influence of spinal anomalies, especially filum terminale lipomas with normal positioned and low positioned medullary conus, in the functional impact and to discuss when the surgical approach should be performed.
MATERIALS AND METHODS: A retrospective cohort study of 9 patients with anorectal anomalies presenting thickened or lipomatous filum terminale and submitted to filum terminale section from January 2003 to January 2019. Data were collected through medical records from the neurosurgery outpatient clinic. The following variables were analyzed: demographic (sex, age), preoperative and postoperative clinics (urological symptoms / urodynamic, neurological and orthopedic examinations), radiological and surgical (information on ascending spinal cord after section).
RESULTS: In 4 patients, the conus was normal positioned, while it was in a low position in the other five patients. Among the 9 patients, 8 evolved with clinical improvement (urological and motor). Among the patients with urological improvement, there was a significant improvement in bladder sensitivity with social continence, although other urodynamic parameters remain unchanged. Only 1 patient, who had only urinary symptoms, did not benefit from the surgical treatment, despite the low conus position.
DISCUSSION AND CONCLUSIONS: Spinal cord abnormalities affect approximately 26-50% of patients with anorectal abnormalities and are generally found among patients with severe anorectal anomalies. Despite this, the treatment remains controversial. Some authors advocate conservative treatment, since urological changes generally remain unchanged. However, we present 8 cases with clinical improvement after surgery, generating subsidies for the surgical indication in selected cases.

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Idiopathic intracranial hypertension in pediatrics, a diagnostic and therapeutic challenge

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OBJECTIVE: We decided to analyze through a retrospective study a group of patients with intracranial hypertension in a pediatric hospital in Buenos Aires, Argentina. We studied the onset symptoms, clinical evolution, and the treatment of choice, comparing outcome between medical or surgical procedure. We consider this topic one of interest because besides being a rare condition (incidence 1-3 / 100,000), it causes vision deficit in children and adults. For this reason, it is essential to make informed desitions, with early diagnosis and implementation of effective treatments to avoid a visual deficit. Since inadequate treatment can cause optic nerve atrophy that eventually leads to blindness, making this disease not as benign as it seems.
MATERIALS AND METHODS: A descriptive retrospective study was conducted in all children admitted to our hospital with signs and/or symptoms of intracranial hypertension for the last three years (2013-2016). Between this period, 91 patients who consulted for symptoms of intracranial hypertension were hospitalized, and only 21 of them (23%) were diagnosed with benign intracranial hypertension. We use the modified Dandy criteria to select patients.
RESULTS: We obtained 38% of patients with obesity, 4.7% with growth hormone deficit, 4.7% with acute lymphocytic leukemia (without central nervous system involvement) and, finally, 4.7% with precocious puberty. All patients received medical treatment with a favorable response in 95.5% of the cases. Acetazolamide was used at 40 mg / kg / day. Only two patients (9.5%) required surgical treatment (ventriculoperitoneal shunt). All patients receiving treatment improved his visual acuity. The average hospitalization days were 14.9.
DISCUSSION / CONCLUSIONS: With correct diagnosis and early treatment this disease has a good prognosis and avoids the most feared complication, permanent visual deficit. The follow up was made with lumbar punctures. Obtaining a normal opening pressure allows us to continue with medical treatment for 6 months and eventually reduce the dose or even stop the medication.

Keywords: Idiopatic/Benign intracranial hypertension - medical treatment - surgical treatment

Langerhans cell histiocytosis with compressive effect: an atypical presentation

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OBJECTIVE: The objective of this paper is to report a case of an unusual pathology (Langerhans cell histiocytosis) with an atypical clinical course.
MATERIAL AND METHODS: This paper was carried out by monitoring and reviewing the patient's medical records. A brief review of the literature was conducted on the "PUBMED" platform on this subject.
RESULTS: A 4-year-old female girl reached a pediatric emergency with a complaint of severe headache and paresis in the upper right limb, with no palpable masses in the skull. A head tomography revealed a left frontoparietal osteolytic lesion with meningeal damage, causing secondary edema and compression of the adjacent brain parenchyma. A parietal craniectomy and duroplasty were performed. The material was sent for biopsy, which revealed the diagnosis of Langerhans cells Histiocytosis. After the surgery, the patient recovered strength in the right upper limb and underwent other imaging tests, which showed similar lesions in the Femur. The patient was then referred to the pediatric oncology service.
DISCUSSION: Langerhans cell histiocytosis is a rare disease found primarily in children with an estimated incidence of 0.2 to 2.0 cases per 100,000 children younger than 15 years old. There is a peak incidence of 2 to 4 years of age. This is an unusual proliferative disorder of Langerhans cells and antigen presenting cells of the dendritic lineage. The most common presentation is unifocal (about 65%) and bones are the most frequently affected tissue, representing 90% of the cases. The skull is a commonly affected site. (1)
CONCLUSIONS: The most common presentation is a tough painful mass on the calvary. The case we report is specially different from those reported in the literature, because, in addition to the meningeal invasion, we also have a multifocal non palpable tumors with compression of the brain tissue due to edema, leading to paresis. The atypical clinical course made the diagnosis especially difficult.

Keywords: Langerhans cell histiocytosis, Neurosurgery; Paresis

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Social violence and Traumatic Brain Injury in Paediatric patients: A cross-sectional study

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OBJECTIVE: To assess the impact of social violence on paediatric victims of TBI in a reference hospital in Bahia.
MATERIAL AND METHODS: A cross-sectional study including paediatric patients (Age: 0-17), who had TBI and were victims of social violence, admitted and discharged from September 2010 to December 2017 at Hospital do Subúrbio. Through analysis of medical records, the severity of TBI was classified according to Glasgow Coma Scale, assessed the type of violence suffered and correlated with the clinical condition at hospital discharge.
RESULTS: The severity of TBI suffered by the 487 patients enrolled to this study was classified as mild in 87.5% of the cases, severe in 10.1% and 2.5% were moderate. TBI was caused by cold weapons (48.7%), physical force (40.5%) and firearms (10.9%) and 10.3% of the total of cases were associated with domestic violence. Regarding clinical evolution, 89.5% of patients presented full recovery, 5.5% died and 4.9% had neurological dysfunction at discharge. In the mild TBI group, most patients (98.6%) were fully recovered at discharge while 1.4% presented dysfunction. Patients with moderate TBI recovered in 66.7% of the cases while 33.3% presented dysfunction. No deaths were registered for the group. Of all patients with severe TBI, 55.1% died, 28.6% had dysfunction and 16.3% were completely recovered at discharge. Considering the cases involving cold weapons and physical force, over 95% of the patients had total recovery while in the cases in which TBI was caused by firearms, 43.4% of the patients died, 34% had dysfunction and 22.6% had total recovery. Regarding cases of domestic violence, 17.3% involved physical force, 6.8% cold weapons and there was no case of firearms use.
DISCCUSSION AND CONCLUSION: The study showed that while trauma caused by firearms is usually severe and results in death, most patients who were injured by cold weapons fully recovered.[1–3] The number of studies specifically associating TBI and social violence in paediatric population is limited and even fewer directly correlate trauma mechanism and clinical outcome. This highlights the need for more studies in this field in order to develop a better understanding of the issue. Furthermore, such studies also play an important role in alerting authorities about the necessity of active interventions to prevent the problem and in assisting health professionals in diagnosis and risk stratification and treatment of TBI in children.

Keywords: traumatic brain injury, paediatric, social violence

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Brachial plexus injury in children not related to the birth. Series of 30 cases

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OBJECTIVE: Brachial plexus injuries are more frequent in young adults and are mainly due to trauma. The brachial plexus lesions in children occur more frequently in the neonatal period due to shoulder dystocia. Changes in the brachial plexus in children who are not due to problems during childbirth are poor analysed in the literature. The authors retrospectively analysed 30 cases of children with non-childbirth brachial plexus injury. Differences were analysed in relation to adult patients, mainly regarding observed aetiologies and the analysis of surgical results.
MATERIAL AND METHOD: We retrospectively studied 32 medical records of patients in the age group 0 to 16 years old, from January 2010 to December 2017. Two patients were withdrawn from the study due to lack of clinical follow-up. All cases of obstetric brachial palsy were excluded from the study. We analyzed variables related to age, gender, cause of brachial plexus injury, type of plexus injury, time to surgery, proposed surgeries and results. The causes were analysed according to the reports of parents. The aetiology of the lesion was divided into groups: traffic accidents, penetrating injury, traction, fall and inflammatory. The lesions were classified as partial and total according to limb impairment. The surgical techniques used were divided into grafting and nerve transfer. Regarding the surgical technique, we analysed the results of the use of intercostal nerve transfer. We considered clinical improvement in patients who achieved grade 3 or higher motor function by the BRMC scale. The results were submitted to statistical evaluation.
RESULTS: The patients were predominant males (67%). The mean age was 4.5 years. Most of the patients presented partial plexus injury and affected shoulder function and elbow flexion. Total lesions were more prevalent in patients of greater age and related to motor accidents with higher energy. The main cause was the automobile accident in 27% of the cases. There were 3 cases of plexus injury due to inflammatory processes. It was also observed that the clinical and epidemiological characteristics were different from the adults. The surgical correction observed principles like cases in adults, except that the phrenic nerve was not used in children. Preference was given to performing nerve transfers in relation to nerve grafting. In 77% of the cases, functional improvement occurred for grade 3. Results with intercostal nerve utilization were superior to those observed in adults, with a 60% improvement, when the objective was the treatment of total brachial plexus injuries. The early time elapsed for the accomplishment of surgery, did not show statistical difference for a better result.
CONCLUSION: Brachial plexus injuries in children non related to birth are uncommon and there are few studies that analyse this group of patients. Because they have a different mechanism of injury to neonatal peri-natal trauma, they should be studied separately. [2] At the same time, children have greater neural plasticity and neurological recovery capacity than adults, and therefore should also be studied separately. [3] This research analysed the causes and sought to mechanisms to prevent and define treatment techniques. We observed that there are differences regarding aetiology and a better response to the use of intercostal nerves as a donor in the nerve transfers performed in the severe brachial plexus lesions.

Keywords: Brachial Plexus, Child, Trauma.

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Medulloblastoma in Brazilian Amazon, report of 122 cases.

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OBJECTIVE: To describe clinical, epidemiological and histopathological features, as well as the survival curve of a population composed by 122 patients with the diagnosis of Medulloblastoma in Brazilian Amazon area.
MATERIALS AND METHODS: It was performed a retrospective study from 1999 to 2012, at a reference hospital involving 122 patients diagnosed with Medulloblastoma. There were analyzed clinical, epidemiological and histopathological features besides its correlation with overall survival and progression free survival curves.
RESULTS: There were studied 122 patients with the diagnose of Medulloblastoma, the man-woman proportion was 1,8 and half of patients were under 10 years old. According with the histological subtype we found the following incidence: 78% were Classical Medulloblastomas, 13% Desmoplasic Medulloblastomas and 9% were Anaplasic Medulloblastomas. Regarding surgical resection 78% of all patients were submitted to gross total resection, of whom 66% went under surgery and then adjuvant combined radiotherapy and chemotherapy. Progression Free Survival and Overall Survival in 5 years were respectively 69% and 86%.
DISCUSSION AND CONCLUSIONS: The management of patients with Medulloblastoma has advanced considerably in the past years, specially regarding the development of better devices to neurosurgical techniques, ensuring more precise safety margins and also the compliment of the association of chemotherapy and precise indication of radiotherapy. Therefore, considering the reached indexes of overall survival and progression free survival in the studied population, it must be emphasized the crucial importance of the combined treatment of total resection (when it is possible), radiotherapy (when indicated) and adjuvant polychemotherapy in order to achieve a good prognosis and also to improve the current scenario of patients with Medulloblastoma, today considered a potential curable disease.

Keywords: Meduloblastoma, Survival, Amazon

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Neoplasms of the central nervous system in the first year of life: series of cases from HBDF

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OBJETIVE: The objective of this study is to perform a general analysis of central nervous system (CNS) tumors operated in the first year of life. From this, draw a comparison with the results of the literature.
MATERIALS AND METHODS: A descriptive, retrospective, uncontrolled study was conducted, characterized as a series of cases. Included in the study were children with up to 11 months and 29 days of age, operated due to CNS tumor at the Base Hospital of the Federal District, between 2012 and 2017. All patients had at least 1 year of follow-up. Exclusion criteria were: diagnosis of non-neoplastic lesions and insufficient data on medical records. From the data collected, a review of the medical records of each patient was performed based on a survey in the electronic medical record. Data were extracted from the medical records such as age, sex, signs/symptoms, degree of resection in the surgery, histological type, reoperation for tumor resection, if there were an oncologic treatment, general and postoperative mortality.
RESULTS: This study included 17 patients. The male/female ratio was 1.43:1, about the location of the tumors, 70.6% were in the supratentorial compartment, 11.7% in the infratentorial and 17.6% in the vertebral column. The signs/ symptoms related to intracranial hypertension were more prevalent, occurring in 58.8% of children. In the first surgery, there was complete macroscopic resection (GTR) in 47% of the patients, partial in 35.3% and biopsy in 17.6%. As for histology, there was a predominance of embryonic subtypes and choroid plexus derivatives. Four tumors originating from the choroid plexus (23.5%) were diagnosed, being 3 papillomas and 1 carcinoma. Ten children underwent chemotherapy and none underwent radiotherapy. Mortality was 35.3%, and of these, 11.8% were considered surgical mortalities.
DISCUSSION/CONCLUSIONS: Larouche et al. (2007), in their systematic review, demonstrated that the tumors were supratentorial in 66.1%, similar to our study, which was 70.6%. In this review, there was a predominance of astrocytoma (30.6%), different from our study that showed a predominance of choroid plexus tumors (23.5%). Mehrotra et al. (2009) reported a mortality of 56%, being 22% surgical. This shows that our mortality rate of 35.3%, being 11.8% surgical, is adequate and lower than some series.

Keywords: Pediatric brain tumor, CNS tumor, congenital brain tumor

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What the pediatric neurosurgeon earns when working in multidisciplinary groups? Experience in approaching patients with spinal dysraphism.

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OBJECTIVE: To report the experience as a pediatric neurosurgeon in the context of multidisciplinary work on patients with spinal dysraphism.
MATERIALS AND METHODS: During 18 months we assess actions and strategies in the approach of patients referenced to our pediatric spinal cord injury unit. All cases were sorted and had obeyed to an overall assessment and were followed up in the ensuing areas: Neurosurgery; Urology; Physiotherapy; occupational therapy; psychology and neuropsychology. The clinical condition of the patients was categorized in 05 main domains and prospectively evaluated: Neurogenic bladder; shunt/hydrocephalus; Intellectual performance; Orthopedic deformities and psychological status.
RESULTS: 25 patients were followed-up at average of 150 days (31-213). The mean age was 68,7 months (range 4-180 months). 15 patients had myelomeningocele, 4 sacral, 10 lumbar and 1 thoracic. 07 patients were diagnosed with occult dysraphism. 03 patients were diagnosed with a tethered cord syndrome and referred to surgery, after discussion with all specialists. Such patients had sacral dysraphism and showed documented worsen in urodynamic assessment in association with new foot deformities. A patient with sacral lipoma was diagnosed with renal failure and hasn´t been followed up after 1 year of the initial surgery. In 02 cases, there was indication of shunt revision due to overdrainage. Of the 06 patients who had been indicated surgery, 03 were discharged from their first neurosurgeon. The neurosurgeon of the group had in 02 cases an initial perception of neurological deterioration of the underlying disease which has not been confirmed by the group and in fact they were familiar and affective issues.
DISCUSSION/CONCLUSIONS: Patients with spinal dysraphism should preferably be followed up by multidisciplinary teams [1,2]. Although the decision-making process for a surgical intervention is limited to the neurosurgeon, it is recognized that the phenomenology behind that indication is uncertain. The understanding of this situation in a multidisciplinary perspective reinforces the criteria of validation of these interventions and enables a better recognition of the real health situation of patients.

Keywords: Multidisciplinary management; Myelomeningocele; Spinal dysraphism.

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Pediatric Skull Base Tumors: literature review and analysis of 17 cases in a single center

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OBJECTIVE: The current study aims to review our personal experience and the literature about skull base surgery in children younger than 18 years-old, accessing epidemiology, surgery complications, functional outcomes and mortality.
MATERIAL AND METHODS: The paper describes our experience with 17 children operated for skull base tumors describing age, imagining, tumor location, surgery performed, histopathological diagnosis, degree of resection, surgical complications, adjuvant therapies and recurrence/progression. Additionally, a literature review was carried out describing a total of 267 children operated for skull base tumors.
RESULTS: Of a total of 17 children most were male (11/64,7%). Mean age was 10.5 years-old. The neoplasms histology includes 3 schwannomas (17.6%) and 2 meningiomas (11.7%), and others individual occurrences. The main tumor localization was cerebellopontine angle (4/23.5%), sphenoid bone (4/23.5%), petrous temporal bone (3/17.6%). Surgical approach was retrosigmoid in 5 patients (29.4%), subtemporal in another 5 (29.4%), subfrontal in 2 (11.7%), pterional in 2 (11.7%). Total resection was achieved in 6/35.3% and subtotal in 11/64.7% patients. Radiotherapy was performed in one child (5.9%) and chemotherapy in 3 (17.6%). Regarding the long-term surgical complications 13/76,4% evolved with long term neurological impairment. Five (29.4%) patients evolved with facial paresis, 5 (29.4%) with hypoacusia, 4 (23.5%) with ocular motricity deficit, 2 with hydrocephalus (11.7%), dysphonia was present in 2 (11.7%), visual impairment in 2 (11.7%), epilepsy in one (5.9%) and dysphagia in one (5.9%). In four children (23.5%) there was no long-term impairment. Residual lesion was stable in 11/64.7% of children, progressing in 3/17.6%. One patient tumor recidivated after total tumor resection. No lesion was found after surgery in 3/17.6%. The literature review included 267 patients. Mean age was 10.9 years (R:6.8-13.9) with 58.1% males and 41.9% females. Regarding to histopathology, the review found 10.1% JNA, 7.1% CP Craniopharyngioma (CP), 8.6% Schwannoma, 8.2% Sarcoma, 4.1% rhabdomyosarcoma (RMS), 4.9 % Meningioma (MGM), 3.8% Chordoma, other tumors representing 46.8%.
DISCUSSION AND CONCLUSIONS**:** Skull base tumors are relatively rare in pediatric age, predominating in boys, with very heterogeneous histopathology and lead to considerable morbidly and mortality in pediatric age.

Keywords: Skull Base, Tumor, Surgery, Children

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Neurosurgical planning using the VMTK software interface

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OBJECTIVE: Mastery of neuroanatomy and meticulous neurosurgical planning are the fundamental keys for surgical success, and the use of magnetic ressonance imaging (MRI) are an important tool to perform it. Sulcus and gyrus surface anatomy is not always evident on the craniotomy field and even with a neuronavigating system one can become insecure to correctly identify the surface anatomy. Neuronavigation systems

are not always suitable for imature cranium. Superficial veins of the brain can, however, be visualized pre- and intra-operatively. Therefore, the relations between veins and brain anatomy are helpful in neuroanatomy recognition during pre- operative planning. The purpose of this study was to evaluate the use of a free software called VMTK as an important tool for the neurosurgical planning.
MATERIAL AND METHODS: This study analised prospectively 27 patients (six pediatric patients) with supratentorial lesions who underwent surgery in our hospital from January to February 2018. After loading only a contrast enhanced T1-weighted MRI volume of a patient, the display of the blood vessels and the relevant anatomical fiducial marks were visualized. Then, scalp is cropped off for revealing the underlying region of interest into which the neurosurgeon can navigate with cursors, explore its surrounding eloquent structures and assess its position relative to the anatomical fiducial marks. These images were evaluated through subjective analysis comparing then with photos of the cortical surface performed intraoperatively, with emphasis on the identification of cortical veins and adjacent sulcus and gyrus.
RESULTS: Surgical planning was performed using VMTK and intraoperative images were acquired to compare veins and brain surface with that produced by the software. Relations between veins and brain surface obtained by VMTK showed to be very reliable with that visualized on surgery.
DISCUSSION AND CONCLUSION: Neuronavigation systems are very useful to locate brain lesions, but are still expensive and is subject to errors like brain shifting. VMTK showed to be an important tool to neurosurgical planning, since its curvilinear reformatting tool performed in the patient native space is fundamental for the correct interpretation of brain surface anatomy. VMTK can be an important tool for neurosurgical planning, bringing benefits to patients. It can help to define a craniotomy basis and to identify the brain surface anatomy. This software can be used in conjunction with a neuronavigation system or alone, and, once it is a free software, can be very useful in low income countries.

Keywords: Neurosurgical planning, neuroimaging.

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Report of technique and results of ventral and dorsal rhizotomy for palliative treatment of severe dystonia in cerebral palsy

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OBJECTIVE: Dystonia due to cerebral palsy is a serious entity with a high impact on the child's quality of life and extreme difficulty for caregivers. The authors describe two cases of children who underwent ventral and dorsal rhizotomy for the relief of spasticity and dystonia.
MATERIAL METHODS: Two patients with severe cerebral palsy (GMFCS V), with spasticity and with major dystonia were submitted to ventral and dorsal rhizotomy. The children initially underwent clinical treatment with physical rehabilitation and use drugs such as baclofen, tizanidine, diazepam and trihexyphenidyl. As there was little improvement in dystonia, they were submitted to botulinum toxin applications. In both cases, arthropathies, manipulation pains and sedation were observed with increasing doses of medication. Treatment options were evaluated and ventral and dorsal rhizotomy was performed, with 50% of motor roots and 80% of dorsal roots. Initially in the lumbar region and the second time in the cervical region.
RESULTS: Patient 1 was 12 years old at the time of the first surgery, and submitted to cervical surgery 30 days later. There were no surgical complications and there was improvement of spasticity of the limbs and reduction of the dystonic movements. There was improvement of the position in opistotton, although the trunk spasticity did not improve significantly. The pains in the hip and in the lower back ceased. Caregivers reported an important improvement in care. Patient 2 was 14 years old at the time of surgery. , had urinary retention and intermittent catheterization was required. There was a significant improvement in dystonia in the limbs and in the cervical region.
DISCUSSION: The initial treatment of dystonia is with medications, but in severe cases the response is limited. In view of this situation, the surgical options are divided into ablative procedures and modulative surgeries to dystonia and spasticity. Among the surgical modulators are deep brain stimulation (DBS) and baclofen pumps. Those procedures are expensive and needs frequently revisions or medical appointments. Ablative procedures include pallidotomy and rhizotomy. Patients unable to undergo modulatory surgeries may benefit from ablative surgeries. Only a few reports describe the benefits of ventral and dorsal rhizotomy [1]. Our cases showed good response and all those families were satisfied with the results, especially in improvement to day care.
CONCLUSIONS: Rhizotomy is an extensive surgery involving two segments of the spine, but they have shown a good result, mainly in the improvement of the palliative care of the children.

Keywords: rhizotomy, spasticity, dystonia

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Risk Factors and Results of Hemispherotomy Reoperations

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OBJECTIVES: To evaluate preoperative factors that may result in failure of hemispherotomies and the outcome of reoperations.
MATERIALS AND METHODS: Review of medical records of 15 consecutive cases submitted to hemispherotomy reoperation at a dedicated epilepsy surgery center between 2003 and 2018, with emphasis on the following data: age, etiology of epilepsy, surgical technique, surgical findings in reoperation, magnetic resonance imaging findings, Engel's classification and postoperative complications.
RESULTS: Out of 150 cases of hemispherotomy, 15 underwent reoperation due to recurrence of seizures. Rasmussen encephalitis, with 7 cases (47%), was the most frequent etiology, followed by hemimegalencephaly, with 6 cases (40%), porencephaly, 1 case (6.5%) and Sturge-Weber syndrome, 1 case (6.5%). The technique used was the peri-insular hemispherotomy without temporal lobectomy in 13 cases, with lobectomy in 1 case and parasagittal hemispherotomy in another case. In eleven patients there was radiological evidence of incomplete disconnection, of which 8 were in the splenium of the corpus callosum, 4 were in some other portion of the corpus callosum, and 2 had a remaining frontobasal connection, confirmed intraoperatively. In cases without MRI diagnosis, the surgical finding was: 2 with incomplete fronto-basal disconnection, 2 with remaining splenium, and 1 was complemented with temporal

lobectomy. Seizures improved in all patients after reoperation, with 5 Engel 1A and 3 Engel 3 in those with more than one-year follow-up, and 4 Engel 3 and 3 Engel 1 in those with less than one-year follow-up. There were three complications (20%): one surgical wound infection and two cases of hydrocephalus requiring shunt.
DISCUSSION/CONCLUSIONS: Peri-insular hemispherotomy is a safe and effective technique, whose greatest challenge is disconnecting the splenium of the corpus callosum. Children with hemimegalencephaly due to anatomical distortion and Rasmussen's encephalitis, in whom the brain parenchyma is indurated and the ventricular size is reduced, are more likely to be incompletely disconnected. Reoperation is safe and able to achieve good results after a thorough redo of clinical and radiological assessments.

Keywords: Epilepsy, Hemispherotomy, Reoperation

Selective cervical dorsal rhizotomy as a promoter of neurofunctional improvement in spastic children with cerebral palsy.

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OBJECTIVE: To analyze the quantitative neurofunctional parameters, aiming to demonstrate the clinical improvement of spastic children with cerebral palsy (CP), submitted to cervical selective dorsal rhizotomy (SDRC).
MATERIALS AND METHODS: In the period from October 2017 to November 2018, 5 children with CP evaluated by the multidisciplinary team of the Integrated Center for Rehabilitation (CEIR, Tersina-PI), were submitted to CSDR at the Hospital Infantil Lucidio Portela (HILP, Teresina-PI) for the treatment of spasticity, following the following protocol: neurofunctional evaluation (pre, intra and sixth postoperative month), intraoperative neurophysiological monitoring, physical rehabilitation after surgery (specific protocol) and interdisciplinary follow-up (neurosurgery, neurology, orthopedics (GMFCS, Modified Ashworth, Goniometry, GMFM, PMAL and MACS).
RESULTS: According to the data analysis, the majority of patients are at functional levels IV and V of the GMFCS and MACS scales, where some have acquired joint deformities, certified by goniometry under sedation, reflecting the severity of their motor alterations and determined limits of the proposed therapeutic objectives. However, after CSDR, a significant reduction of values measured by the Modified Ashworth scale was verified, which corroborates with the increase in the PMAL scale score and the GMFM scale A, B and C domains.
DISCUSSION AND CONCLUSIONS: A large number of scientific publications have confirmed the effectiveness of CSDR for the treatment of spasticity in children with CP. In this study, a measurable clinical improvement after CSDR was observed, in a protocol that included preoperative, intraoperative and postoperative neurofunctional evaluation and the use of intraoperative neurophysiological monitoring, with 80% of the section of the dorsal roots being compromised, that there were no significant or persistent sensory alterations after surgery.

Keywords: Cerebral Palsy, Spasticity, Selective Dorsal Rhizotomy.

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Selective lumbar dorsal rhizotomy as a therapeutic alternative for spasticity related to microcephaly caused by the Zika vírus

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OBJECTIVE: To analyze the efficiency of Lumbar Selective Dorsal Rizotomy (LSDR) in the treatment of spasticity related to microcephaly caused by the Zika virus.
MATERIALS AND METHODS: It is a series of 4 children with spastic tetraparesis related to microcephaly caused by the Zika virus (tested with ELISA for positive Zika in the cerebrospinal fluid and negative serology for other infectious causes of microcephaly such as toxoplasmosis, cytomegalovirus and rubella). Classification and functional quantification scales (GMFCS and Modified Ashworth) were used before, during and postoperatively in each one, all of them being submitted to LSDR. Finally, a comparative analysis was performed between pre and postoperative data.
RESULTS: 3 of the 4 patients present GMFCS level V and 1, level IV. The preoperative results for the modified ashworth scale ranged from 0 to 3 for all muscle groups of the lower limbs and post surgical procedure presented zero degree for all musculature.
DISCUSSION AND CONCLUSIONS: The increase in the number of cases of microcephaly caused by the Zika virus in the last 4 years was significant. Thus, it was necessary to seek therapeutic means in order to improve the prognosis of the children affected. LSDR is a neurosurgical procedure with proven efficacy in the treatment of spasticity, however, there are no records in the literature that relate rhizotomy to the therapeutic evolution of encephalopathy caused by the virus in question. This work presents great relevance, since it brings concrete data evidencing the clinical evolution after the neuroablative procedure in comparison with the preoperative clinic. In this context, LSDR is effective in the treatment of spasticity related to microcephaly by the Zika virus, proven by the comparison of functional and preoperative assessment scales.

Keywords: Cerebral Palsy, Arbovirosis, Modified Ashworth.

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SBN-Ped Traffic-related injury program: influence of early elementary school safety education on family seat belt use

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OBJECTIVE: Traffic-related injuries have become a major public health concern worldwide. Approximately 1.2 million people are killed each year in road crashes around the world, with up to 50 million more injured (1,2). This paper reviews selected interventions and strategies that have been developed to counter traffic-related injuries in terms of their effectiveness and their applicability to low-income countries. Young children can learn safety behavior in the public school system, and they can to spreed to other groups. It's a pilot program from Pediatric Brazilian Neurosurgery Society.
MATERIAL AND METHODS: A school-based injury prevention program targeting students from 7 to 10 years of age addressed aspect of traffic safety: seat belt use. After inservice instruction, teachers taught the program over a 10-week period. A simultaneous community traffic safety program was conducted through the media. Family seat belt use was monitored by blinded observation. School program implementation was defined as good or poor, based on adherence to teaching protocol.
RESULTS: From 2012 to 2018 there were 6637 traumas admissions in Emergency Unity from University Hospital in patients less than 18 years of age. A systematic prevention program was started in an elementary school in 2019 in Ribeirao Preto (Ateneu Barao de Maua).
CONCLUSION: Elementary school safety education improves family seat belt use, low income schools should be targeted, and strict adherence to the teaching protocol is essential.

Keywords: Traumatic injury, Injury prevention, Brain injury

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SUBGALEAL SHUNTING FOR POSTHEMORRHAGIC HYDROCEPHALUS - SERIES OF 21 CASES

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OBJECTIVES**:** Posthemorrhagic hydrocephalus comprises the most common complication in those premature neonates whose suffered germinative matrix hemorrhage, and its treatment is still matter of controversies. These infants usually weight less than 1500g and a temporary CSF diversion device is needed. This paper depicts the initial 21 cases of ventriculosubgaleal shunting (VSGS) in prematures who suffered grades III and IV periventricular hemorrhage and hipertensive hydrocephalus.
MATERIAL AND METHODS**:** We analyzed a series of 21 preterm infants who underwent VSGS for posthemorrhagic hydrocephalus between July 2015 and November 2018. The median gestation age was 28 weeks (range 23-32). The median weight was 890 grams (range 625-1615). The mean span of time harboring de VSGS was 59,3 days (range 39-78). This paper is not addressed to explain the surgical technique performed.
RESULTS**:** The cases were studied for: 1) revision of the system: 4/22 subjects (19%) had 2 system revisions each due to obstruction; 2) shunt related complications: 6/22 infants (28,5%) had positive CSF culture and the VSG converted to EVD and further VP shunt. (2 of these showed previous CSF fistula through the wound); 4) convertion to VP shunt: 11/22 children (50%) showed persistent hydrocephalus at further investigation, and underwent to VP shunt after stable clinical condition and weight higher than 2000g. One death occurred in a very low birth weight subject who developed severe thrombocytopenia and pulmonary hemorrhage.
DISCUSSION/CONCLUSIONS: The main goal about treating these very low weight infants is prevent infection anyway. Since the VSGS in this study show low rates of infection (28,5%), one must point out that it could be an excellent tool to decrease intracranial pressure while these infants are too small for definitive treatments. Furthermore the Vp shunt conversion rate (50%) is similar to another devices as Omaya Reservoir and EVD technique with lower handling of the system. Thus VSGS is a good alternative method to treat posthemorrhagic hydrocephalus in preterm infant whose need a temporary shunt device. The low rate of severe complications and encouraging results about persistent hydrocephalus should guide further investigation and larger cases series.

Keywords: Posthemorrhagic Hydrocephalus; Subgaleal Shunting; prematurity

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Surgical treatment for metopic synostosis with trigonocephaly.

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OBJECTIVE: The premature closure of metopic suture results in a skull deformity with a triangular forehead shape called trigonocephaly, which features midline forehead ridge, frontotemporal narrowing and a compensatory increased biparietal diameter. Normally the metopic suture should be closed within 9 months of age in all patients (1). There is an increasing incidence of this type of synostosis from 4-10% to 15-25% recently . Surgery is indicated to restore the skull volume and correct the deformity of the forehead and orbits (2). Metopic ridge without trigonocephaly is not an indication for surgery (3). The aim is to review the surgical experience in the treatment of trigonocephaly.
METHODS: Were studied 51 consecutive patients operated between 1996 and 2017 by the senior author. Were recorded demographics, weight, blood loss and complications. The surgical technique consisted of extensive decompression with frontal remodeling and bilateral supraorbital advancement. All patients receive a invasive arterial pressure monitoring, oximetry and capnography. Intraoperatively, careful attention to bleeding, use of Colorado needle to skin incisions and early blood transfusion was used to avoid hemodynamic instability. Also hypothermia was

avoided and any acid-basis imbalance was corrected. Patients have the tracheal tube removed at the end of surgery and received a post-operative care in the pediatric intensive care unit.
RESULTS: Boys were 35 (69%) and girls were 16 (31%) with an average age of 10 months of age (range from 5,7 mo to 2 years) and average weight of 9 kg (range from 6 to 14 kg). Most cases, 50 (98%), were non-syndromic with only one case with Rethore syndrome(46 XX, del 9). Resorbable plates were used in 26 patients (51%) for bone fixation. Bone cement were used in 7 patients. Only one patient need reintervention for correct irregularities in the forehead secondary to bone cement. Complications occurred in 5 patients (12%): 3 externalization of wires which need to be removed, 1 case with excessive blood transfusion and 1 pulmonary infection/atelectasia and 1 case with bone cement irregularties. There were no surgical mortality. Aesthetic results were considered Excellent in 45 cases (88%). Less satisfactory results were seen in 6 patients :3 cases early in the series persisted with some depression in the temporal fossa and 3 cases persisted with some irregularities in the forehead.
CONCLUSION: Excellent surgical results for trigonocephaly, with no mortality and low morbidity can be achieved with an experienced team.

Keywords: trigonocephaly, metopic synostosis, surgical treatment

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Spinal cord compression among patients with neuroblastoma: a single-center experience

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OBJECTIVES: To evaluate the treatment results and characteristics of patients with spinal cord compression (SCC) secondary to neuroblastoma (NB)
METHODS: We performed a Retrospective observational study of all patients diagnosed with neuroblastoma treated in a Brazilian pediatric cancer center, from 2006 to 2017. Patients were evaluated according to tumor stage and site, demographic characteristics, treatment performed and final outcome emphasizing neurological improvement.
RESULTS: Eighty-nine patients with NB were included and analyzed. We divided them in two groups: Group 1 - within 16 patients that had radiological SCC and Group 2 - within 73 patients without SCC. Both groups were comparable for sex (p=0.5826) and age (p=0.2273). The median follow-up was 5.3 years, ranging from 1 to 12 years. Patients with disease in stages III and IV had a higher risk for SCC than those in stages I and II of disease (RR 9.3, CI =1.1 – 74.5, p=0.01). Patients with tumor located outside the peritoneal space were at higher risk of SCC (RR 7.4, CI=16-172.3, p=0.0175). Scoliosis was 16 times more prevalent in patients with SCC than in those without SCC (p=0.0175). Considering treatment of SCC, four patients were neurologically intact and were treated by chemotherapy, one of these needed further surgical resection. All remained neurologically intact. Three patients' development acute SCC symptoms (unable to walkin less than one week). Two of them received emergence radiotherapy, with complete neurological improvement. The other underwent a surgical resection and also had neurological improvement (Frankel C to Frankel E). Five patients with incomplete chronic deficits were treated by chemotherapy followed or not by radiotherapy and all of them had full neurological recovery. Four patients presented with complete neurological deficits with more than 48 hours of paralysis. They did not underwent surgical treatment and were treated with chemotherapy. No one had neurological improvement and three (75%) developed latter scoliosis.
CONCLUSIONS: 18% of the children with NB has radiological SCC. The risk factors for development of symptoms secondary to SCC were advanced stages of disease (III and IV) and tumor location outside peritoneal space. All treatments used singly or in combination were effective in improving the neurological status in patients with incomplete deficits. Patients with complete and persistent neurological SCC generally had an unfavorable recovery with high risk for further scoliosis.

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Cranioencephalic trauma due to firearm design in the pediatric population: identification of prognostic factors

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OBJECT: To identify the prognoses related to TCE by PAF.
MATERIALS AND METHODS: Data from 40 patients underwent a surgical treatment in our institution during the interview through variable frequency of absolute and percentage variables for the variables: age, sex, location and trajectory of PAF, ECG Admission , tomographic changes and Glasgow score scale at discharge (GOS). Pearson's Chi-square test or the Fisher's exact test were used. The data was entered in the EXCEL worksheet and the program used to obtain the statistical calculations was IBM SPSS in version 23.
RESULTS: 91.7% of the male gender, the age ranged from 8 to 17 years, the frontal region was the most common place of entry, with 44.4% of the parietal wall 30.6% and occipital 22.2%; penetrating trajectory in 47.2%, perforating / transfixing in 38.9% and tangential in 13.9%. The following tomographic things were involved: sagging (77.8%), cerebral contusion (38.9%) and HSAt (36.1%); ECG admission 3-8 points in 52.8% of patients, 9 to 12 in 5.6% and 41.7% in 13 to 15. GOS of 1 and 2 in 47.2%; 27.8% died and 25.0% presented GOS 3 and 4 (not recommended or vegetative), that is, 52.8% were interviewed in category 3 to 5
DISCUSSION AND CONCLUSIONS: Cranioencephalic trauma (TBI) is the main cause of death among neuropediatric patients, accounting for about 50% of deaths among adolescents. Among the causes are the falls, trampling, car accidents, aggressions and projections of firearm (PAF), about 20% of these cases. Reinforced Bibliography with a Glasgow Command (ECG) scale of admission and a project trajectory are

presented as main prognostic factors. Results of the test that, like the ECG It admits the partnership with the large difference ($p < 0.05$, OR equal to 6.72) with the GOS in the high and for a reference variable it was reported that the percentage that had a bad fate (3 to 5) was higher among those who were classified with ECG on admission 3 to 8 than 9 to 15 (73.7% x 29.4%), compatible with the literature.

Keywords: Cranioencephalic trauma; fire gun; pediatrics

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Choroid plexus tumor in children: surgical results

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INTRODUCTION: Choroid plexus (CP) tumors in children are rare. These lesions can be very bloody, in close proximity to very important structures, making a complete surgical resection challenging, especially in small children (1,2). The purpose was to review surgical results.
METHODS: 470 patients, under 18 years of age, received surgical treatment for intracranial tumor from 1996 to 2017 and 19 (4%) were CP tumors. Data was collected prospectively, and reviewed from our brain tumor database. All tumors were operated by the senior author (JWJB)
RESULTS: Nine boys and ten girls were operated. Age ranged from 1 month to 7 years, with an average of 29 months. The most frequent presentation was intracranial hypertension, in 18 patients (95%), with hydrochepalus in 19 (100%), focal deficits in 3 (16%) and seizures in 2 (11%). The tumor location was the lateral ventricle in 18 (14 in the atrium and 4 in the occipital horn) and only 1 case in the third ventricle. The histopathology revealed CP carcinoma in 53% (n=10), CP papilloma in 37% (n=7) and atypical CP papilloma in 11%(n=2). Total resection was obtained in 89% (n=17) and partial resection in 11% (n=2). All patients with CP papilloma had total resection. Definitive treatment for hydrocephalus after tumor removal was necessary in 68% (13/19) of patients with hydrocephalus (12 VP shunt and 1 third ventriculostomy). There was no transoperative mortality or surgical mortality in 30 days. No recurrence was seen with CP papilloma.
CONCLUSION: Although these lesions tend to be large, bloody, and to occur in small children, a successful surgery with total resection can be obtained in the vast majority of cases with low mortality. CP papilloma is a curable disease only with surgery.

Keywords: intracranial tumor, choroid plexus tumor, papilloma, carcinoma

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Glial and glioneural tumors associated with epilepsy: epidemiology, surgical results and pathology

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OBJECTIVE: Epilepsy affects more than fifty millions of people around the world. Refractory seizures compromise development and quality of life of pediatric patients and result in a higher risk of sudden unexpected death in epilepsy (SUDEP). Long-term epilepsy-associated tumor (LEAT) describes a group of glial and glioneural neoplasms represented mainly by DNETs and gangliogliomas associated with early onset and pharmacoresistant epilepsy but presenting good surgical outcomes [1-2]. Early surgical treatment for such patients is the best approach to avoid cognitive deterioration or even improve it. This paper describes the epidemiology, histopathological pattern and surgical outcomes of pediatric patients assisted in our service presenting glial and glioneural tumors associated with epilepsy.
MATERIAL AND METHODS: A retrospective observational study of medical reports of pediatric patients presenting glial and glioneural tumors associated with epilepsy underwent the surgical treatment in a reference pediatric neurosurgery center between 2002 and 2016.
RESULTS: 29 patients were included, 16 (55.1%) were male and 13 (44.8%) were female; the age of occurrence of the first seizure ranged from 1 year to 13 years, with a mean of 4.9 years; 12 patients (41%) had exclusively focal seizures; 17 patients (59%) also had bilateral tonic-clonic seizures. The interval between the first seizure and surgery was on average 2.36 years; 20 patients (69.0%) presented neoplasms involving the temporal lobe, 3 (10.3%) the parietal lobe, 1 (3.4%), the frontal lobe, 1 (3.4%) occiptal lobe, and 4 (13.8%) affecting 2 or more lobes. Of the total of patients underwent surgical treatment, 16 (55.1%) underwent lesionectomy and 13 (44.8%) underwent extended resection. The anatomopathological results were: 14 (48.3%) gangliogliomas, 9 (31.0%) DNETs, 2 (6.9%) pilocytic astrocytomas, 2 (6.9%) pleomorphic xantoastrocytomas, 1 %) mixed glioneural tumor and 1 (3.4%) anaplastic oligondendroglioma. After a year of follow-up 82.8% of the patients presented with Engel I. At the end of the study 75.9% remained with satisfactory control of the seizures (Engel I and II).
CONCLUSIONS: The early surgical treatment of glial and glioneural tumors associated with epilepsy is an effective option for the control of seizures and prevention of long-term complications.

Keywords: LEAT, pharmacoresistant epilepsy, surgery for epilepsy.

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Use of photogrammetry with smartphone to monitor cranial deformities: pilot case

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OBJECTIVE: This study aims to demonstrate that the use of photogrammetry with smartphone in children with cranial deformity is feasible in medical practice, being able to replace more expensive methods, maintaining good quality and in a cheaper way. This being a pilot case.
MATERIALS AND METHODS / CASE STUDIES: In this study, using a Samsung S7 smartphone, a video of a child with scaphocephaly was performed preoperatively, after signing the informed consent form. It was necessary to put a cap on the child to enable proper capture of the image. Subsequently a video was made around the child's head in order to capture the entire cephalic perimeter. The images were reconstructed in 3 dimensions (3D) using Agisoft ® software on a laptop for home tasks. Another video was done postoperatively, after 15 days, followed by 3D reconstruction and compared with the preoperative one.
RESULTS: The images of the child were done without discomfort, with good approval by the parents, demonstrating that the reconstruction is feasible, reliable and simple to be performed, and can be used for outpatient follow-up of these children. As the laptop does not have high settings for image processing, the rebuilding process slows down, with the time varying from 1 to 2 hours.
DISCUSSION AND CONCLUSIONS: In this way, we present an innovative method, which until now, only 3 studies with isolated cases were found in the literature whose purpose was to validate the method in relation to others already used. Therefore, it is a method that uses no form of radiation and requires only a cellular camera and an enabled computer, which is cheaper than similar methods such as stereophotogrammetry and laser scanning. The difficulty of the method is to keep the child immobile, which has been made possible with children's videos for distraction. Another problem is the manipulation of software and images, which requires a skilled professional or the physician's interest in learning. The intention of this study is to carry out a pilot case, so that we can plan a large scale project and demonstrate that this method is feasible and reliable for medical practice. Thus, this is another way to follow-up these children, fitting into the reality of a public system as the "Sistema Único de Saúde", the public health system from Brazil.

Keywords: Craniosynostosis, photogrammetry, smartphone.

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External validation of ETV success score in 313 Brazilian Children with long term follow-up

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OBJECTIVE: The goal of this study is to evaluate Endoscopic Third Ventriculostomy Success Score (ETVSS) in prediction success until one year after endoscopic third ventriculostomy (ETV).
MATERIAL AND METHODS: Brazillian Children less than 18 years underwent first ETV were prospectively evalluated between 1996 to 2016. ETVSS was obtained for each patient and the success rate after 6 and 12 months after procedure was compared. Clinical and radiological improvements was considered as success criteria. Minimum twelve months of follow-up was required. ROC (*Receiver Operating Characteristic*) curve was obtained.
RESULTS: Three hundred thirteen children underwent first ETV were analyzed. The Majority of children had 2-10 years old 91(31,2%). Aqueductal stenosis was observed in 141(45%) followed by Chiari II 48(15,3%) and non-tectal tumors 65(20,8%). ETV global success rate was achieved in 73,2% of patients in the first 6 months and decreased for 65,2% in 12 months. Nevertheless, there was statistically significance among ETVSS and success rate even long term follow-up. The area under ROC curve was 0,660 in six months and 0,668 in 12 months after ETV.
DISCUSSION/CONCLUSION: ETVSS is a model develloped for estimate ETV success until six months after procedure[1]. In the present study, is demonstrated effectiveness in prediction success even in one year after this procedure.

Keywords: Hydrocephalus; Endoscopic third ventriculostomy; Neuroendoscopy.

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Prognostic value of SNP TP53 ARG72PRO in the susceptibility oh the development and also in the survival of patients with Medulloblasma in Brazilian Amazon.

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OBJECTIVE: To investigate the role of single nucleotide polymorphism (SNP) TP53 Arg72Pro over the risk of development, prognosis and response to adjuvant treatment in patients with the diagnosis of Medulloblastoma.
METHODS: It was performed a case-control study with 244 individuals, of whom 122 with the diagnosis of Medulloblastoma and 122 in the control arm. The study of epidemiological variables and the clinical manifestations of the neoplasms was realized retrospectively through data collection from the hospital cancer chart. It was done the extraction, quantification and amplification of DNA through PCR technique and also realized the genetic sequencing of the interest zones of polymorphisms of this study (TP53 gene). The equilibrium of the case and control populations were assessed by Hardy-Weinberg law. In order to verify whether SNP's genotype distribution was similar between both groups as well as age, gender, vital status, grade and tumoral subtype, it was performed the Qui-Square or Fisher Exact Test (F). For all tests it was admitted a significance level of 5%
RESULTS: Comparing to Arg/Arg, which is the most common genotype in the study population, neither Arg/Pro nor Pro/Pro genotypes influenced the risk of development of Medulloblastoma (OR = 1,36 and P = 0,339 for Arg/Pro genotype; OR = 1,50 and P = 0,389 for Pro/Pro genotype). Regarding to prognosis, the disease free survival rate wasn't significantly

different among SNP TP53 Arg72Pro genotypes (P> 0,05), however the less frequent genotype, Pro/Pro, was associated to a lower overall survival of patients with Medullobastoma (P = 0,021).
DISCUSSION AND CONCLUSION: In conclusion, this is the first analysis of SNP TP53 Arg72Pro in patients with Medulloblastoma. Although there is no association between this genetic variation and the risk of development of Medulloblastomas, Pro/Pro genotype was related to a lower overall survival in patients who underwent adjuvant therapy. However, regarding the interethnic composition of Brazilian population, further studies with a bigger population and with people from other countries will be necessary for a definite conclusion of the role of Arg72Pro TP53 SNP in the susceptibility to Medulloblastoma's development.

Keywords: Medulloblastoma, TP53, Prognostic.

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