

born from a healthy mother with no history of Ace-inhibitor exposure. Apgar score was nine at 1 minute and ten at 5 minutes. Dysmorphisms, in the absence of macrocephaly, were observed including marked epicanthus, low ear implant, micrognathia, and ogival plate. Transfontanelar ultrasound showed significant hypocalvaria with marked diastase of the lambdoidal sutures. Skull x-ray confirmed diffuse reduction in calvaria ossification and hypodevelopment of the splanchnocranium. Neuropsychological testing observed alterations in motor, visual, and audiological functions. Ecardiogram showed atrial septal defect. Genetic testing by array-CGH revealed 1q21.1 duplication of 13 oligonucleotides. Although whole body x-ray was negative for abnormalities, whole exome sequencing on both parents and the newborn confirmed cleidocranial dysplasia.

Conclusions: In newborns presenting with hypocalvaria, cleidocranial dysplasia should be considered in differential diagnosis. In the early stages, hypocalvaria and facial dysmorphisms may be the predominant findings, whereas dental abnormalities, or clavicle hypoplasia may not be detected, further challenging diagnosis. Whole exome sequencing holds a pivotal role to confirm suspicion.

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SAGITTAL NEOSUTURE FOLLOWING SCAPHOCEPHALY CORRECTION SURGERY

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Background: Originally mentioned in 1966 by Shillito, neosuture formation after surgery for craniosynostosis remains a poorly characterized phenomenon. The aim of this study was to determine whether a sagittal suture reformation associates with a better reconstruction result.

Methods: Children operated for dolichocephaly from January 2013 to December 2020 were identified in our data base for this retrospective analysis. We included all patients for which both preoperative and postoperative CT scans were available for study and measurements - 86 children from the 117 patients operated for a scaphocephaly in the fore mentioned period. Pre and postoperative cephalic index(CI) was calculated and data was statistically analyzed with Fisher's exact test and student t-test.

Results: 18 girls and 68 boys, with a mean age at surgery of 6.8 months were included in our study, from which 60(69.76%) were operated by the endoscopic technique. Postoperative control 3D scan showed a sagittal neosuture in 41 patients(47.67%). Age at surgery less than 5 months correlated with a better chance of reforming the sagittal suture after H-shaped craniectomy - OR 2.8, p value .03. CI was corrected from a mean of 66.52 to a mean of 75.01 in patients with neosuture, while the CI correction in the second group went from a mean of 66.35 to a mean of 73.73. Data analysis shows that the correction difference between the 2 groups is statistically significant (p value .026, t value 1.96), with a better correction in patients where a neosuture is formed postoperatively. In addition, neosuture correlates with a higher rate of normalization of the CI - 53.65% vs 30%, p value .04.

Conclusion: Reformation of sagittal suture after reconstruction craniectomy correlates with a higher rate of increase in CI, providing better anthropological results. The optimal age to operate on children with scaphocephaly seems to be around 4-5 months.

6.3 Spinal dysraphisms

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THE ROLE OF INTRAOPERATIVE ULTRASOUND IN SURGERY OF OCCULT SPINAL DYSRAPHISMS

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Background: Occult spinal dysraphism (OSD) leading to tethered cord syndrome can determine neurological deficits during growth. Despite the complexity of some untethering procedures, especially in complex lipomas, partial surgery may lead to re-tethering and delayed deterioration. We aimed to evaluate the role of intraoperative ultrasounds (IOUS) in a surgical series of children harboring OSD, to investigate the benefits of intraoperative ultrasonographic guidance during the different subgroups of dysraphic lesions.

Methods: All consecutive children affected by OSD who underwent surgery from 2019 to 2021 were evaluated. When possible, the Pang's classification was used. Intraoperative standard B-mode images were acquired using a dedicated linear or

microconvex probe. The lesions were identified and measured, and defined as hyperechoic, isoechoic or hypoechoic. We also considered the presence of calcifications, the relationships with the surrounding anatomical structures, mainly the conus and caudal roots, the presence of syringomyelia, the level of conus descendence.

Results: Eleven children with spinal dysraphism who underwent surgical repair were examined, comprising a wide spectrum of OSD, from filum terminalis lipoma, limited dorsal myeloschisis, diastematomyelia, up to transitional, dorsal, and chaotic lipomas. Visualization of the cystic compartments, identification of the neural structures, and identification and localization of the associated lesions were all reliably achieved in all cases. Intraoperative ultrasonographic guidance could determine the type of lesion and the associated lipomas, ectopic tissues, dermoid and epidermoid cysts, and doubling of the spinal cord, and locate diastematomyelic spurs, bands, and adhesions. Components filled with cerebrospinal fluid appeared as anechoic areas and lipomas as hyperechoic. The exact characteristics of each subtype of OSD and the role of IOUS per every single case will be detailed.

Conclusion: Intraoperative ultrasonographic guidance could help to correlate the complex anatomy identified on preoperative neuroimaging to the surgical site during the operation and the neurophysiological monitoring results.

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MATERNAL STATUS OF TRACE ELEMENTS AND RISK OF NEURAL TUBE DEFECTS IN OFFSPRING: A META-ANALYSIS OF 6121 PREGNANCIES

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Background: Neural tube defects (NTD) are one of the most severe congenital birth defects. Their etiologies are not fully known, but genetic and environmental factors might play a role. Studies on the effect of trace elements and heavy metals as environmental factors, present inconsistent results, therefore we conducted a meta-analysis to assess the association between the levels of these elements in pregnant women and the risk of NTD in newborns.

Method: We searched in PubMed, Cochrane Library, Scopus, and Web of Science databases until December 2021. Standardized mean difference (SMD) with 95% confidence interval (CI) was applied using either a fixed- or a random model for essential trace elements and toxic metals levels from different maternal samples. **Result:** There were 27 observational studies including 2463 patients with NTDs and 3658 controls subjected to meta-analysis. The maternal serum and blood concentrations of **Lead** were significantly higher in the NTD group compared to the normal healthy group (SMD = 0.33, 95%CI [0.19, 0.47]), (SMD = 1.68, 95% CI [0.24, 3.11]), respectively. The **Selenium** levels were significantly lower in the plasma (SMD = -1.99, 95%CI [-3.36, -0.62]) and higher in the placenta (SMD = 0.70, 95%CI [0.57, 0.84]) of NTD group had higher placental **Iron** and serum **Copper** concentrations (SMD = 0.12, 95%CI [0.00, 0.24]), (SMD = 0.50, 95%CI [0.15, 0.85]), respectively. The maternal serum and hair **Zinc** deficiencies were associated with an elevated risk of NTDs, (SMD = -1.43, 95%CI [-2.83, -0.04]), (SMD = -1.27, 95% CI [-1.94, -0.60]), respectively. NTD group had higher levels of placental **Manganese** (SMD = 0.77, 95%CI [0.65, 0.90]).

Conclusion: The maternal status of trace elements and toxic metals is associated with the risk of NTD in offspring. Therefore, it should be recommended that mothers monitor the consumption and exposure to these elements before and during the pregnancy.

6.4 Supratentorial Tumors

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AUGMENTED 5-AMINOLEVULINIC ACID DERIVED PHOTODYNAMIC THERAPY

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Background: The 5-aminolevulinic acid (5-ALA) induced elevation concentration of protoporphyrin IX (PPIX) in glioma cells makes photodynamic therapy (PDT) of these tumor cells feasible. Previous experiments showed that additional administration of Ko-143, an ABCG2 inhibitor, may lead to a further elevation of