childhood, originating from a skeletal or dental malrelationship. Children with this malocclusion exibit diskinetic reverse chewing patterns which are characterized by a completely altered neuromuscular activation and coordination.

Aim: The aim of this study was to characterize the mandibular kinematics and the neuromuscular of children with unilateral posterior crossbite.

Material and methods: Eighty-two children (8.6 +/- 1.3 yr of age) with unilateral posterior crossbite and 12 children (8.9 +/- 0.6 yr of age) with normal occlusion were selected for the study. Electromyography (EMG) and kinematics were concurrently recorded during mastication.

Results: The percentage of reverse chewing in the group of patients was 59.0 +/- 33.1% (soft bolus) and 69.7 +/- 29.7% (hard bolus) when chewing on the crossbite side. When chewing on the non-affected side, the number of reverse cycles was 16.7 +/- 24.5% (soft bolus) and 16.7 +/- 22.3% (hard bolus). The reverse cycles on the crossbite side were slgnificantly narrower with respect to the cycles on the non-affected side and resulted in lower EMG activity of the masseter of the crossbite side; the activity of the contralateral masseter was larger for reverse than non-reverse chewing cycles.

Conclusions: The clinical significance of these results is that, in children with unilateral posterior crossbite, the neuromuscular coordination is completely altered establishing a severe functional and muscular asymmetry which should be corrected as early as possible to let the children a balanced growth.

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NEAR-INFRARED-SPECTROSCOPY TO DETERMINE CEREBRAL OXYGENATION IN NEONATES: DO ABSORPTION AND SCATTERING COEFFICIENTS CORRELATE WITH SKIN, BONE, AND CEREBROSPINALFLUID THICKNESS?

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Background: Taking into account both the attenuation of light and the phase-shift, frequency domain near-infrared-spectroscopy (FD-) NIRS enables to measure the absolute scattering (µs') and absorption (µa) coefficients of tissue.

Aim: To evaluate the effect of skin, bone, and cerebrospinalfluid thickness on µa and µs'.

Methods: The Oxiplex TS (ISS Inc., Champaign, IL, USA) FD-NIRS and proprietary data analysis software were used in clinically stable neonates: gestational age 34 (30 4/7-39 6/7) [weeks], postnatal age 11 (1-45) [days], weight 2,810 (2,650-3,860) [g]. The optode was placed over the right temporo-parietal-region and four measurements of at least 2 minutes each were performed per subject at 1Hz sampling rate. To determine the thickness of the tissues, cranial ultrasound was performed (Toshiba Aplio, applying a 7-14MHz longitudinal transducer). All data are median (min.-max.).

Results: For all patients µs' and µa at 692nm were $7.92(4.55-8.92)cm^{-1}$ and $0.086(0.076-0.1345)cm^{-1}$, and at 834nm were $6.20(3.67-7.51)cm^{-1}$ and $0.102(0.090-0.135)cm^{-1}$. Skin thickness was 1,5(1.1-1,7)mm, bone thickness was 2,9(2,6-2,3) mm and cerebrospinalfluid thickness was 3,1(2,4-3,7)mm. In univariate linear regression analysis µa correlated negatively with skin thickness (692nm: $r^2=0.91$; 834nm: $r^2=0.74$), and to a lesser extend with cerebrospinalfluid thickness. µs' correlated positively with bone thickness (692nm: $r^2=0.49$; 834nm: $r^2=0.79$).

Conclusion: Skin, bone, and cerebrospinalfluid thickness were correlated with µs' and µa. It is unclear whether this correlation is causal or confounding and if it affects the accuracy of NIRS measurements.

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INTENSIVE CARE MANAGEMENT AND FOLLOW-UP OF SEVERE TRAUMATIC BRAIN INJURY IN CHILDREN

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Introduction: Traumatic brain injury (TBI) is the leading cause of paediatric morbidity and mortality in developed countries. Acquired disability can be evaluated by King´s Outcome Scale for Childhood Head Injury (KOSCHI).

Objectives: Evaluate care and outcome in children with severe TBI.

Methods: Analysis of clinical and demographic data of children admitted between January 2008