Cranial Ultrasound

Ultrasound imaging of the head uses sound waves to produce pictures of the brain and cerebrospinal fluid. It is usually performed on infants, whose skulls have not completely formed. A transcranial Doppler ultrasound evaluates blood flow in the brain's major arteries. Ultrasound is safe, noninvasive, and does not use ionizing radiation.

In the past three decades, cerebral ultrasound (CUS) has become a trusted technique to study the neonatal brain. It is a relatively cheap, non-invasive, bedside neuroimaging method available in nearly every hospital. Traditionally, CUS was used to detect major abnormalities, such as intraventricular hemorrhage (IVH), periventricular hemorrhagic infarction, post-hemorrhagic ventricular dilatation, and (cystic) periventricular leukomalacia (cPVL). The use of different acoustic windows, such as the mastoid and posterior fontanel, and ongoing technological developments, allows for recognizing other lesion patterns (e.g., cerebellar hemorrhage, perforator stroke, developmental venous anomaly). The CUS technique is still being improved with the use of higher transducer frequencies (7.5-18 MHz), 3D applications, advances in vascular imaging (e.g. ultrafast plane-wave imaging), and improved B-mode image processing. Nevertheless, the helpfulness of CUS still highly depends on observer skills, knowledge, and experience ¹⁾.

Point-of-Care Ultrasound.

Ultrasound for periventricular-intraventricular hemorrhage

Ultrasound for periventricular-intraventricular hemorrhage

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Dudink J, Jeanne Steggerda S, Horsch S; eurUS.brain group. State-of-the-art neonatal cerebral ultrasound: technique and reporting. Pediatr Res. 2020 Mar;87(Suppl 1):3-12. doi: 10.1038/s41390-020-0776-y. Review. PubMed PMID: 32218539; PubMed Central PMCID: PMC7098885.

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