Transfontanellar ultrasound

Transfontanellar ultrasound is widely used to study neonatal neuroanatomy and disease. This technique has many advantages, such as the absence of ionizing radiation and its wide availability, portability, and low cost. The development of more powerful ultrasound scanners and improved microcurved and linear probes of different frequencies have resulted in improved image quality. To take full advantage of this technique, it is important to know the normal and pathologic anatomy in neonates. Transfontanellar ultrasound is the first-line technique for studying short-term and mid-term complications in premature newborns. In full-term newborns, it is very useful in many clinical situations, making it possible to select which patients will benefit from other techniques that are more invasive or more expensive, or that require sedation, such as MRI. The disadvantages of the technique are that it is operator dependent and that an appropriate acoustic window is necessary. It also has limitations in the study of obstetric trauma, in the evaluation of complex malformations, and in the assessment of damage to white matter. With a basic understanding of neonatal neurology, the appropriate equipment, and a careful technique taking advantage of the different fontanels, transfontanellar ultrasound is a reliable method that makes it possible to diagnose and follow up both congenital and acquired conditions in neonates [1)].

This is a bedside technique that visualizes the brain through the fontanelles and the sutures, in three planes: coronal, sagittal, and horizontal. Excellent visualization of the ventricular system, caudate nuclei, the thalamus, the choroid plexus, the corpus callosum, and the foramen of Monro is obtained. This method has good definition using high frequency transducers since there is no bone interference. The ultrasound diagnosis correlated well with computed tomography (CT) and with direct pathologic studies. This technique was more sensitive in diagnosing small IVH/SEH and organized clots than were CT studies [2)].

Systematic transfontanelar ultrasound (TF) screenings for preterm is useful for early diagnosis and staging which might improve the management of rehabilitation therapies, and provide appropriate information on the disease outcome as well as influencing the quality of parental counseling [3)].

The anterior fontanelle associated with the posterior fontanelle was better than the use of the anterior fontanelle alone in the identification of intraventricular/periventricular hemorrhage. Ultrasound using the posterior fontanelle allowed diagnosis of unsuspected grade II hemorrhage by the anterior fontanelle. Use of the posterior fontanelle was also useful to clarify presence of hemorrhage in inconclusive examinations by the anterior fontanelle [4)].

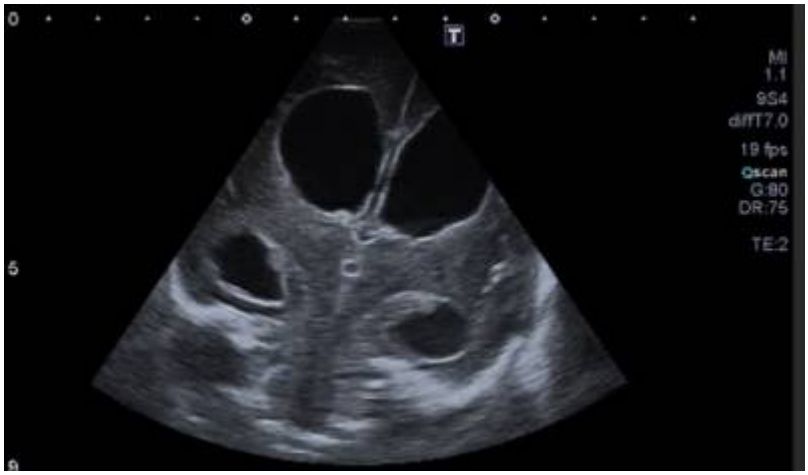
Transfontanellar ultrasound for hydrocephalus

Hydrocephalus is the most frequent reason for request of transfontanelle ultrasound scan and also the most frequent abnormal finding [5)].

Preterm newborn of 28 + 6 weeks. Transferred due to suspicion of hydrocephalus.

Dilated lateral ventricles with a bifrontal diameter of 4.3 cm. Left thalamo-occipital distance 4 cm, right 4.2 cm. Diffuse hyperechogenicity of the ventricular walls in relation to ventriculitis. Clots adhered to the choroid plexus and in the declining area of the occipital horns. Slightly dilated 3rd ventricle (thickness 6 mm measured in the coronal plane) with a hyperechogenic clot occupying its lumen. 4th ventricle was slightly dilated, without appreciating intraluminal clots by this technique. In

addition, multiple millimeter cysts were observed in the periventricular deep white matter, confluent, predominantly in the periatrial region, in relation to periventricular leukomalacia. Diffusely thinned corpus callosum. Centered midline. Resistance indices cannot be measured due to the altered morphology of arterial curves with inversion of diastole below the baseline.



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