

Detection of midline shift of the brain by 3-D ultrasonography

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ABSTRACT

The mid-line shift of the brain is a crucial clinical sign of risk of permanent brain damage in cases of head trauma. The extent of midline shift helps in the deciding the management protocol of such patients. This is currently detected and quantified with a CT scan. Here, a novel technique using an ultrasound probe to detect the midline and calculate the shift. A 'Skull and brain' phantom with a space simulating the midline and third ventricle is made. The single element probe is used to image this midline through the temporal acoustic window on both the left and the right sides. The 'shift' is calculated by subtracting the positions of the midline when imaged through the left and right side of the skull. The purpose of this work is to establish the proof of concept for the imaging of the using our sonography technique. The goal is to design a non-invasive, automated ultrasonic device to measure the midline shift, to be used in the emergency care setting in the health centres/hospitals.