The Kolibri IG system (Brainlab AG, Feldkirchen, Germany) was used to track a hand-held Doppler probe of a DWL Multi-Dop® T digital device (Compumedics Germany GmbH, Singen, Germany). The patient's head was registered noninvasively to the IG system. Distance between predefined vascular target and optimal Doppler signal was evaluated to assess spatial accuracy of image-guided TCD. To investigate reproducibility, spatial accuracy of trajectories acquired during an initial examination using the IG system was analyzed in serial examinations. Furthermore, stability of noninvasive registration of the patient's head to the IG system was analyzed. Data are presented as mean±SD for descriptive statistics. Twelve patients were included. RESULTS:

Using IG, a Doppler signal was recorded immediately in all cases for middle cerebral artery (MCA) (29 examinations), in 81% for carotid-T (27 examinations), and in 90% for basilar tip (29 examinations). The optimal Doppler signal was found within 2.64±1.15 mm (94 preplanned targets). At serial examinations, a spatial deviation of 2.75±1.20 mm was found (56 trajectories acquired in 19 serial examinations). Examination time did not influence accuracy of noninvasive patient registration. CONCLUSIONS:

Data suggest that image-guided TCD allows for accurate examinations with high intraprocedural and high interprocedural reproducibility. It facilitates identification of specific vessel segments and generation of standardized examination protocols for serial examinations [1].

[1]

Greke C, Neulen A, Kantelhardt SR, Birkenmayer A, Vollmer FC, Thiemann I, Giese A. Image-guided transcranial Doppler sonography for monitoring of defined segments of intracranial arteries. J Neurosurg Anesthesiol. 2013 Jan;25(1):55-61. doi: 10.1097/ANA.0b013e31826b3d55. PubMed PMID: 23027224.

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