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Differentiation of Transverse Sinus Thrombosis From Congenitally Atretic Transverse Sinus With TR-MRA：An Exploratory Study

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Abstract

Background: We aimed to establish the value of Time-resolved contrast-enhanced magnetic resonance angiography (TR-MRA) in identifying thrombosis of transverse sinus(TS) in patients with a unilaterally absent TS signal on MRV. Methods: Forty-five patients who were suspected of TS thrombosis clinically with a unilaterally absent TS signal on phase contrast(PC) MRV, were evaluated with TR-MRA. Images obtained by each technique were assessed independently by two neuroradiologists for whether the absent signal was thrombosis or atretic TS. The final diagnosis given based on clinical data and all radiological images(including the asymmetry of the sigmoid notches and TR-MRA) by a consultant neurologist was set as the gold standard and then, the accuracy of radiological diagnosis were validated by observing the agreement with it. The image quality comparison between PC MRV and TR-MRA via calculating signal-to-noise ratios [SNRs] and contrast-to-noise ratios [CNRs] of the normal TS. Results: For imaging quality of normal TS, the mean SNR and CNR of TR-MRA were 452.14 and 440.92 respectively, significantly higher than the values of PC MRV (both $p<0.001$). The interobserver agreement of TR-MRA in identifying TS thrombosis from atretic TS was excellent [κ =0.951; 95% confidence interval (CI) 0.902-1.000], much higher than MRV (κ = 0.526; 95% CI, 0.389–0.663). Consensus of assessment based on TR-MRA was highly consistent with the gold standard (sensitivity of 100%, specificity of 93.75%) , superior to PC MRV (sensitivity of 75%, specificity of 81.8%). Conclusion: TR-MRA is better than PC MRV in the visualization of TS, and helpful to distinguish thrombosis from congenitally atretic TS.