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Titel des Beitrags: ARFI-based tissue elasticity quantification in comparison to histology for the diagnosis of renal transplant fibrosis.

Abstract: Until recently clinical diagnosis of chronic renal allograft dysfunction could only be established invasively by renal biopsy. Given the risks of that procedure, a non-invasive, diagnostic test would be very advantageous. Novel ultrasound-based elasticity tools, using "Acoustic Radiation Force Impulse (ARFI)" technology are now available. Previously this technique has been utilised to quantify liver fibrosis. First results of these studies are promising. The purpose of our study was to investigate correlation between stiffness values obtained by ARFI-quantification and histological fibrosis score in renal transplants. We employed "Virtual Touch(TM) tissue quantification" (Siemens Acuson, S2000) to quantitatively measure tissue stiffness in the cortex of transplant kidneys. Eighteen patients were included in this prospective study, recording close temporal ARFI-quantification and fibrosis measurements. All patients undergoing renal transplant biopsy were examined with ARFI-quantification (15 measurements per transplant kidney). Resistive indices were also calculated from pulsed-wave Doppler ultrasound. Transplant biopsies were histologically evaluated by a reference nephropathologist and graded according to the percentage of fibrosis and to the BANFF-score. Due to the
non-normal distribution of the data the Spearman-correlation-coefficient (rho) was used to assess the bivariate relationship of ARFI and fibrosis in the transplant kidney. There was a significant positive moderate correlation between mean ARFI-values and the grade of fibrosis (rho = +0.465; p = 0.026). This correlation was also valid for the mean ARFI-values and the BANFF-category (rho = +0.468; p = 0.025). There was no significant correlation between the mean ARFI-values and the resistive indices in the transplant kidney (rho = +0.034; p = 0.904). Nevertheless, a positive correlation between the mean RI-values of the kidney and the grade of fibrosis was established (rho = +0.563; p = 0.015). The mean values of ARFI measurements and the resistive indices are potentially independent explanation variables for evaluating the grade of fibrosis in transplant kidneys.

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