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Application of Ultrasound in Nephrology other than Vascular Ultrasound

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Recently, point of care ultrasonography (POCUS) conducted by clinicians has become an important diagnostic tool at the bedside, especially in an objective assessment of volume status. POCUS does not involve detailed morphological examinations; instead, it aims to address specific clinical questions, thereby aid in the clinical decision-making process. Focused cardiac ultrasound allows for immediate evaluation assessing the presence or absence of pericardial effusion, gross chamber enlargement, left ventricular size and motion and valvular dysfunction. Lung ultrasound serves as a crucial indicator for guiding management, revealing extravascular lung water within the lung interstitium and aiding in assessing fluid status. In a normally aerated lung, the only visible structure is the pleura, observed as a bright horizontal line (A lines) between the rib shadows, shimmering on ultrasound. A positive "B-line region" is defined as the presence of three or more B-lines in a longitudinal plane between two ribs. B-lines can be seen in conditions like diffuse pulmonary edema, suggesting interstitial syndrome. POCUS can enhance the clinical evaluation of venous congestion using venous Doppler with IVC ultrasound. Blood flow in hepatic veins is typically pulsatile. As right atrial pressure increases, the amplitude of the D wave in the hepatic vein flow pattern exceeds that of the S wave, eventually leading to S wave reversal. The normal portal vein waveform is continuous and above the baseline. As the severity of congestion increases, it becomes pulsatile with flow reversal. In conclusion, evaluation of cardiac function by FOCUS, pulmonary congestion by LUS, and systemic venous congestion using abdominal venous Doppler can guide management by providing information on fluid assessment. Interpreting these assessments in isolation is subject to numerous pitfalls. Therefore, it is important to integrate POCUS findings with clinical and laboratory data in the decision-making process.



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