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From Fistula to Fingers: Point of Care Ultrasound Diagnosis of Carpal Tunnel Syndrome in a Hemodialysis Patient

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Case Study : Carpal tunnel syndrome (CTS) is the most frequently occurring complication of dialysis-related amyloidosis (DRA), primarily affecting patients undergoing long-term hemodialysis (HD). It results from compression of the median nerve by amyloid deposits, primarily composed of β 2-microglobulin (BMG). Diagnosis of CTS is typically established based on clinical signs and symptoms, and confirmed through nerve conduction studies. However, point-of-care ultrasound (POCUS) can serve as a valuable tool for the early detection of CTS in this population. We present the case of a 69-year-old male with end-stage kidney disease secondary to hypertensive nephropathy, who had been on maintenance HD since 2010 via a left radio-cephalic arteriovenous fistula (AVF) (Figure 1A). He presented with a one-year history of numbness and tingling in the third and fourth digits of his left hand. Vascular access ultrasound revealed no significant abnormalities, apart from severe vascular calcification around the anastomotic site and outflow tract. Brachial artery blood flow volume measured 1500 mL/min, and the cannulation zone was unremarkable (Figure 1B–D). Despite the absence of vascular abnormalities, the patient reported persistent numbness, tingling, and pain in the third and fourth digits, particularly worsening at night and interfering with sleep. Physical examination revealed a negative Tinel sign but a positive Phalen test. Given these findings, POCUS of the median nerve was performed at the pisiform level (Figure 2), revealing a cross-sectional area (CSA) of 1.2 mm², consistent with moderate CTS. The ultrasound image demonstrated nerve swelling within the carpal tunnel, with surrounding hyperechoic structures. CTS is a common but often overlooked complication in long-term HD patients, with symptoms that can overlap with other vascular and neuropathic conditions. Distal hand ischemia remains a critical differential diagnosis in this population. POCUS serves as a rapid, non-invasive, and effective modality for diagnosing CTS, allowing for timely intervention and improved patient outcomes.

Figure 1.JPG

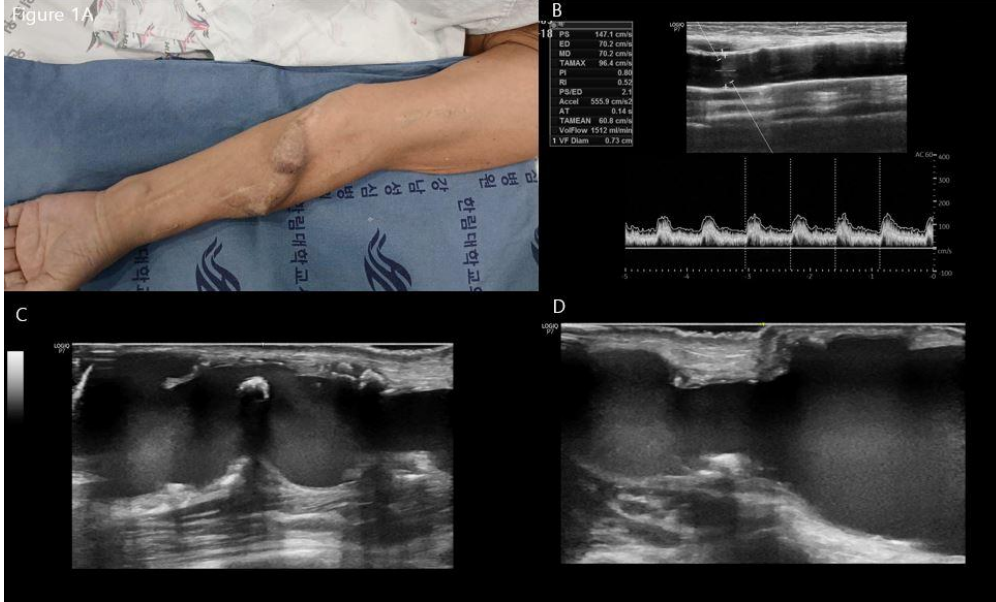


Figure 1.JPG

