Anticoagulant-related nephropathy: a common complication hiding in plain sight

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An 85-year old woman was referred with acute on chronic renal impairment detected prior to elective atrioventricular node ablation for atrial fibrillation. She had recently completed a course of amoxicillin for sinusitis, but had been otherwise well with no macroscopic haematuria and no changes to her regular medications. She had been anticoagulated on warfarin for six years with a recent international normalised ratio of 3.0. Serum creatinine had risen from a baseline of 200mmol/L to 460mmol/L over two months. Urine studies revealed haematuria (2022×10^6 RBC/L) and a protein-creatinine ratio of 60mg/mmol. Autoimmune serology was negative and renal tract ultrasound showed a previously known atrophic left kidney. Renal biopsy showed extensive red cell casts and fresh red cells within the renal tubules with normal glomeruli by light and electron microscopy (Fig. 1). Warfarin therapy was ceased and the patient was discharged on an intermediate-dose of enoxaparin. Since discharge one month ago her renal function has consistently improved with a current creatinine of 300mmol/L. She is planned for insertion of a left atrial appendage closure device, aiming to facilitate cessation of systemic anticoagulants.

Anticoagulant-related nephropathy (ARN) should be suspected in patients on anticoagulation with unexplained acute kidney injury (AKI) and haematuria. Initially identified among patients on warfarin, there is mounting evidence that ARN also occurs with novel oral anticoagulants, though

the risk may not be as high¹. Whilst the true rate of ARN is uncertain, epidemiological studies suggest that it may be as high as 20%², indicating that ARN is an under-recognised complication of anticoagulation. Risk factors include chronic kidney disease and over-anticoagulation². Whilst mechanical obstruction of the renal tubules is believed to drive pathogenesis, the underlying molecular mechanisms remain unclear³. Renal biopsy confirms the diagnosis, demonstrating obstruction of the renal tubules by erythrocyte casts in the presence of normal glomeruli. Barriers to diagnosis include confounding risk factors for AKI such as cardiovascular disease and diabetes, and reluctance to perform renal biopsy on anticoagulated patients. A high degree of clinical suspicion is needed for this likely under-diagnosed condition. Management of ARN is predominantly supportive and may include reversal of coagulopathy, if safe to do so. Prognosis is variable, however most patients experience only partial recovery of renal function².

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Fig. 1

Renal biopsy showing numerous tubular red cells casts in the absence of glomerular pathology.

Haematoxylin and eosin stain. Original magnification x200.

IMJ_15030_Figure 1.jpg

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