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NEPHROSPHERE-LIKE STRUCTURES IN URINE OF ALLOTRANSPLANT RECIPIENTS FOLLOWING ACUTE KIDNEY INJURY

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INTRODUCTION AND AIMS: Tubular regeneration following acute kidney injury (AKI) undergoes a complex but already well-investigated course in rodent models. Tubular progenitor cells involved in this process have been identified by a specific marker profile. These are mostly localized at the proximal tubule and were shown to have the potential to proliferate.

METHODS: Using urine cytology, cell separation, tissue culture, immunofluorescence and qPCR, we evaluated the urinary sediment of 64 patients recovering from AKI due to a renal insult or having received a cadaver allograft due to end-stage kidney disease. We compared patients with AKI, who were allograft recipients with non-allograft recipients.

RESULTS: The urinary sediment changed from fragmented aquaporin 1 (AQP1) - positive cells towards mitotic AQP1-positive cells, depending on the stage and time point of testing. This was confirmed by qPCR. A marked difference was observed when AKI of non-transplanted was compared with transplanted patients. 37.78% of transplant recipients excreted nephrosphere-like cellular agglomerates in urine in a time-dependent fashion. These expressed various kidney tubule-specific marker proteins such as AQP1, CD10, Gata3, to a different extent. Using specific culture conditions these could be expanded and show increased expression of AQP1 and even a change in morphology towards podocytes.

CONCLUSIONS: We hypothesize that these nephrosphere-like structures represent the origin of nephrogenic adenomas found in the urinary bladder of transplant recipients, which have been described in literature several years ago.