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Urinary pH measurement after renal obstruction. Can it be used as a marker for recovery of renal function?

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Introduction: Urinary tract obstruction impairs renal function and is often associated with a urinary acidification defect caused by diminished net H⁺ secretion and/or HCO₃⁻ re-absorption. In animal models, obstructed kidneys with urinary pH above 7.00 have significant reduction in creatinine clearance when compared with obstructed kidneys with urinary pH 7.00 or less. Regain of urine acidity is associated with recovery of renal function.

Materials and Methods: Urinary pH was measured on regular intervals for 5 days in 10 patients with obstructed kidneys following insertion of nephrostomy tube. Urinary pH was checked for bladder urine (indirect measurement for non obstructed Kidney pH) and nephrostomy urine in 9 patients with unilateral obstruction and from both kidneys in one patient with bilateral obstruction.

Results: The eGFR for all patient with unilateral renal obstruction was >60. Urine infection was excluded in all patients.

The nephrostomy urine pH for patients with unilateral obstruction was at variance with the bladder urine pH. The nephrostomy urine pH had higher mean pH as compared to bladder urine (best example pH 7 nephrostomy and 5.5 Bladder). The nephrostomy urine tend to become more acidic with time reflecting improvement in renal function (best example pH 7-5.7 day 5). In the patient with bilateral obstruction, the renal pH showed gradual acidification (5.7-5.5) with improvement of renal function detected by GFR (18-44).

Conclusion: Acidification of urine following insertion of nephrostomy tends to be associated with evidence of improvement in renal function. These observations may be useful as an immediate indicator of renal function recovery following obstruction, especially in patient with normal renal function and obstructed unilateral kidney.