Factors Resulting in Worsened Renal Function in Patients Undergoing Partial Nephrectomy

Introduction and Objective: Nephron-sparing nephrectomy is encouraged so as to maximise remaining renal function in patients with small renal tumours. However, many clinical and technical challenges affect patient outcome to preserve post-operative renal function. In this study, we reviewed the factors that may result in worsened renal function in patients undergoing partial nephrectomy in our institution.
Materials and Methods: This was an IRB-approved retrospective review of partial nephrectomies performed in our institution between March 2007 and November 2010. Clinico-pathological and surgical factors were analysed. Estimated glomerular filtration rate (eGFR) was calculated using the CKD-EPI formula.
Results: A total of 28 partial nephrectomies (n=23 open and n=5 pure laparoscopy) were analysed. All were clear cell renal cell carcinoma (n=27 were T1a and n=1 was T1b). There were 16 male and 12 female, with mean age of 57.1 years old (range of 38 to 75 years old). Pre-operative mean R.E.N.A.L. nephrometry score was 6.39 (range of 4 to 9) and mean eGFR was 78.9 ml/min/1.73m^2. Mean intra-operative clamp time was 36.7 minutes (range of 12 to 62 minutes). For patients with worsened post-operative eGFR at 12 and 24 months, there were no statistically significant relationships with age, gender, body mass index, Charlson co-morbidity index, types of surgical access (open versus laparoscopic) and cold or warm ischaemia clamp time. Only higher R.E.N.A.L. nephrometry score was significantly associated with worsened eGFR at 12 months (p=0.008) and 24 months (p=0.014).
Conclusions: Partial nephrectomy is a technically demanding operation. In our study, only higher R.E.N.A.L. nephrometry score was significantly associated with worsened renal function post-operatively up to 24 months. This highlighted the importance of accurate pre-operative imaging and selection of appropriate patients for nephron-sparing surgery.