Retrograde Transvenous Perfusion Cooling of the Kidney, a Valuable Adjunct to In situ Partial Nephrectomy in Complex Renal Cell Carcinoma
First Clinical Results

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We report two cases of complex renal carcinoma in which retrograde transvenous perfusion cooling (RTPC) of the kidney was used as adjunct to in situ partial nephrectomy. Definite advantages seem to favour this technique of regional renal hypothermia. We are hopeful that RTPC of the kidney will in future allow to reduce the frequency of potentially harmful extracorporeal bench surgery with autotransplantation in the conservative management of renal carcinoma. Renal RTPC is applicable whenever the kidney is approached transperitoneally with preliminary exposure of the renal vascular pedicle. Tumour cell spill has to be discussed as possible complication of this method. Both patients are alive 25 and 19 months, respectively, after surgery without evidence of haematogenous, peritoneal or retroperitoneal tumour disease.

Introduction

In conservative surgery of renal carcinoma a variety of surgical approaches has been used including enucleation, partial nephrectomy, allotransplantation, bench surgery and autotransplantation, or any combination of these procedures [11]. Extracorporeal (work bench) surgery with autotransplantation has been over-used and has been associated with too many technical failures resulting in dialysis or transplantation [2]. Surface cooling is the preferred method of hypothermia used for in situ surgery of complex renal lesions. Recently, we successfully applied RTPC of the kidney as adjunct to in situ partial nephrectomy in a case of bilateral renal carcinoma and in a case of renal carcinoma in a solitary kidney.

Patients and methods

Case 1. O. K., a 56-year-old white man, known to be a chronic alcoholic. On the excretory urogram a large space-occupying lesion was found in the left kidney during evaluation for gross haematuria of 14 days’ duration. Aortography was performed; selective angiography showed the upper two-thirds of the left kidney to be infiltrated by a moderately vascular tumour (Fig. 1). The hilar region...
Fig. 1. Case 1. Angiography shows the upper two-thirds of the left kidney infiltrated by a moderately vascular malignancy of the right kidney was occupied by a well-encapsulated mass, measuring $4 \times 4$ cm in greatest diameter and constricting the adjacent renal vein (Fig. 2). Serum creatinine was 1.4 mg\% (normal range: 0.6–1.4 mg\%), the creatinine clearance was diminished to 65 ml/min. Serum uric acid was 8.3 mg\% (normal range: 3–6 mg\%). Lung tomograms, cavography and bone scan were unremarkable. CT scanning revealed no evidence of nodal disease. Through a median laparotomy, left radical nephrectomy with lymphadectomy was carried out. Thereafter, the vascular pedicle of the right kidney was exposed. The ureteral blood supply was secured with a soft bull-dog clamp. After both renal vessels had been taped, the vein was punctured with a 16-gauge angiocatheter* and the artery cross-clamped. Lactated

* In the present as well as in preceding experimental studies, Abbocath angiocatheters, made by Deutsche Abbott GmbH (Max-Planck-Ring 2, Wiesbaden, FRG), were used because of their pliability with a negligible risk of venous perforation.

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