NON CLAMPED, NON ISCHEMIC PARTIAL NEPHRECTOMY - A NEW MODEL OF NEPHRON SPARING SURGERY

SUBHAKANESH S K
Department of Urology, STANLEY MEDICAL COLLEGE AND HOSPITAL

Abstract: Partial nephrectomy is currently regarded as the standard of care for good surgical candidates with organ-confined, anatomically amenable renal masses, and has replaced radical nephrectomy as the treatment of choice for T1 renal tumours when feasible, even in the absence of renal insufficiency. In this approach the strongest modifiable risk factor for renal insufficiency is the duration of ischemia. The case report is presented to emphasize the non clamping non ischemic partial nephrectomy technique, thereby decreasing the renal insult and a better renal function with comparable oncologic outcome with that of a radical nephrectomy for selected cases of renal tumours.

Keyword: partial nephrectomy, radical nephrectomy, non ischaemic nephrectomy

INTRODUCTION
Partial nephrectomy is currently regarded as the standard of care for good surgical candidates with organ-confined, anatomically amenable renal masses, and has replaced radical nephrectomy as the treatment of choice for T1 renal tumours when feasible, even in the absence of renal insufficiency [1–6]. Clamping of the renal pedicle is employed during Partial Nephrectomy to minimize blood loss and ensure negative surgical margin. However, vascular clamping leads to renal ischaemia and reperfusion injury, which are associated with adverse outcomes. A multi-institutional study by Thompson et al. [7] showed that vascular clamping during open Partial Nephrectomy in patients with a solitary kidney was associated with greater risk of urine leak, renal failure and temporary dialysis than PN done without ischaemia. More recently, Lane et al. [8] identified duration of ischaemia as the strongest modifiable risk factor for decreased renal function after PN. Here, we discuss our experience with PN without renal pedicle clamping.

MATERIALS AND METHODS
59 year old male admitted with history of right loin pain for past 2 months. His clinical examination was normal. Renal function tests revealed creatinine 3.4 mg/dl. Liver function tests and urine analysis were normal. USG, CT (figure 1) & MRI (figure 2) showed B/L contracted kidney with a mass of 3.5 x 2.2 cm in anterior surface and near the hilum of right kidney. IVC was normal. No evidence of metastasis. Stage T1NoMo. Partial nephrectomy was planned.

Fig 1 Preoperative CT scan

Fig 2 Preoperative MRI

SURGICAL TECHNIQUE
The kidney was exposed using an extraperitoneal, extrapleural through the 11th rib cutting flank incision. Retroperitoneum entered. The kidney was mobilized within the Gerota’s fascia leaving intact peri-renal fat around the tumor. The renal hilum was dissected, and a vascular tape was encircled and kept loosely for vascular control if needed. More recently, Lane et al. [8] identified duration of ischaemia as the strongest modifiable risk factor for decreased renal function after PN. Here, we discuss our experience with PN without renal pedicle clamping.
were closed with 3-0 vicryl. Tumor bed was closed with 3-0 vicryl over a pledget of gel foam and tightened with hem-o-lok clips. Intraoperative blood loss 400 ml, one unit of blood was transfused. Tumor free margins was confirmed by histopathology.

**DISCUSSION**

After its introduction by Czerny[6] in 1887, Nephron sparing surgery has evolved as a surgical option for localized renal tumours. The traditional indications for NSS included patients with either an absolute indication like a solitary kidney, bilateral tumours or a relative indication like when the contralateral kidney is affected by a condition that threatens its future function.[10] Nephron-sparing surgery has been increasingly used in patients with small localized renal tumors (pT 1a N 0 M 0 , size less than 4 cm) with normal contralateral kidney.[9],[12],[13],[14] There is an expansion of the indications of use of NSS to pT 1b N 0 M 0 (size less than 7 cm) recently.[3],[15] This can be explained on the basis that various reports have shown comparable local control and five-year cure rates of NSS, when compared with radical nephrectomy,[11] along with significant decrease in intraoperative and postoperative morbidity.[3],[7] Open partial nephrectomy is technically demanding and fundamental steps were the surgical approach, vascular control, and mobilisation of the kidney. Then complete excision of the tumour with maximal preservation of normal parenchyma, minimization of the ischemic injury, and finally a good renorraphy. In this approach the strongest modifiable risk factor for renal insufficiency is the duration of ischemia. Although clamping of vessels reduce technical difficulty, this leads to renal ischemia that may adversely affect renal function. The fully perfused partial nephrectomy technique may result in excellent sparing of renal function. In the non clamping method, the renal artery and vein were mobilised and loop is applied around the vessel but never clamped. Although this technique has mostly coupled with enucleation, a method of excision characterised by minimal blood loss and trauma to parenchyma has expanded this non clamping technique to more difficult complex resections.

The major concern of the technique was risk of bleeding and technical difficulty due to loss of clear field due to bleeding. This was managed effectively by having the assistant gently compress the parenchyma adjacent to the cut surface while the surgeon places shallow 4-0 monocril figure of eight sutures into transacted vessel, thereby avoiding hiliar vessel clamping.[20] We in this case obtain haemostasis by compressing adjacent parenchyma. This technique is inexpensive and can be easily practiced by all urologists. In our cases, intraoperative bleeding was 400 ml. The most common renal-related complications after NSS is urinary fistula, occurring in 6.5% patients (range - 1.4- 17.4).[1] In our case, there was no urinary fistula. This can be attributed to our technique of using methylene blue injection through a preplaced ureteric catheter while exciting tumor and subsequently, closing any defect in the collecting system intraoperatively, with absorbable sutures. Another major concern with this approach has been the risk of local recurrence due to inadequate tumor excision or tumor multifocality, thus decreasing long-term survival. However, various studies have proved convincingly the long-term oncological efficacy of NSS in terms of local recurrence and five-year cure rates.[12],[16],[17] The local recurrence and five-year cancer-specific survival has been reported to be 0-7.3% and 89-98% respectively, in different series.[12],[13],[14],[1],[16] In our case, there were no positive margins. Case is on follow up for one year and there was no recurrence (figure 9).
15. Leibovich BC, Blute ML, Cheville JC, Lohse CM, Weaver AL, Zincke H. Nephron sparing surgery for appropriately selected renal cell carcinoma between 4 and 7 cm results in outcome similar to radical nephrectomy. J Urol 2004; 171: 1066-70