Zero ischemia laparoendoscopic single-site partial nephrectomy for renal cancer with low PADUA Score: technique and surgical outcomes.

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Abstract

**Background:** Laparoendoscopic single-site (LESS) surgery has been developed in attempt to further reduce the morbidity and scarring associated with surgical intervention.

To describe the technique and report the surgical outcomes of zero-ischemia LESS partial nephrectomy (ZILESS-PN) in the treatment of renal cell carcinoma with low PADUA-score.

**Material and Methods:** ZILESS-PN was performed in 11 patients with cT1a renal tumors. The indications to perform a zero ischemia LESS-PN was represented by low risk, laterally based renal tumors, located away from the renal hilum and with a PADUA score ≤ 7; operations were performed for localised incidentally discovered renal masses of < 4 cm; all indications were elective.

The Endocone (Karl Storz, Tuttlingen, Germany) was inserted through a transumbilical incision. Demographic data and perioperative and postoperative variables were recorded and analysed. The function of the kidney was evaluated by measuring serum creatinine and estimated glomerular filtration rate (eGFR) pre- and postoperatively and at 6-month follow up. One laparoscopic surgeon (F.G.), with an experience of > 150 conventional laparoscopic partial nephrectomy and 60 LESS operations, performed all procedures.

**Results:** The median operative time was 120 min with a median EBL of 170 ml; ischemia time was zero in all cases and no patient required even momentary clamping of the main renal artery or vein or pelvicalyceal repair. The median LOS resulted to be 4 days and the median length of skin incision was 4 cm. Only one early complication was recorded: one patient developed a flank haematoma which could be treated by conservative therapy (Clavien Grade 1).

In terms of renal function, serum creatinine and MDRD eGFR did not present statistical significant different in the different moments of measurement. The definitive pathologic results revealed a pT1a- renal cell carcinoma in all cases but one, where a pT1a-chromophobe renal cancer was reported. All tumors were removed with negative surgical margins.
At the first postoperative visit, all patients were enthusiastic with the appearance of the scars. At a follow-up, all patients were alive without evidence of tumor recurrence or port-site metastasis.

**Discussion:** Zero ischemia laparoscopic and robotic NSS has been recently proposed in order to reduce or eliminate the risk of a renal damage associated with WIT. Herein, we report a novel technique of zero ischemia for LESS-PN. Our technique encompasses two fundamental aspects: 1) increasing the pressure of pneumoperitoneum to 20 mmHg and 2) transient, controlled, pharmacologically induced reduction of blood pressure, timed to precisely coincide with excision of the tumor.

ZILESS-PN was feasible and safe with the latter combination and ischemia time was zero in all cases with only one early complication which could be treated by conservative therapy.

**Conclusions:** ZILESS-PN is a safe and feasible surgical procedure in the treatment of low risk T1a renal cell carcinoma, with excellent cosmetic results.