Summary

Minimally invasive surgery in the treatment of kidney tumours has developed since the beginning of the nineties. A lot of specialized or top laparoscopic urological centres so-called „centres of excellence“ have been created since the first laparoscopic radical nephrectomy (LRN). These centres have thanks to the centralization of kidney tumour patients sufficient cohorts for evaluation of operative data, operative technique and oncological results. A lot of large studies have been published so far, showing comparable oncological results with open nephrectomy and advantages of miniinvasivity (shorter hospitalization time, less analgesia requirements, better recovery and cosmetics).

LRN is considered a standard of care in the treatment of cT1-2 (≤ 8cm) renal tumours in patients who are not candidates for nephron- sparing surgery. In our department in Plzeň, we have been performing LRN since January 2003. The majority of procedures has been performed by transperitoneal approach. The first LRN in the Czech Republic was done in April 1998 within XII. Conference of Czech Urologic Society by guesting prof. Clayman. We prefer transperitoneal to extraperitoneal approach in our department. The transperitoneal approach provides a larger working space, better anatomical and topographical orientation.We perform retroperitoneal approach only in a few cases where transperitoneal is impossible. First of all, in patients with previous abdominal surgery. It presents only 3 % in our department.

We highly recommend biphasic CT angiography (CTA) as a imaging modality before operation. The advantage of CTA is based on showing exact number and topography of renal vessels and even their anomalies. It helps better, safer and easier dissectioning of renal hilum.

Minimally invasive surgery is connected with larger demand on the technical equipment, operations are becoming more expensive and there are increasing demands on the surgeon.

In conclusion, LRN for kidney tumours cT1-cT2 has become a gold standard in specialized urological centres, what was supported in guidelines of European Association of Urology on renal cell carcinoma in March 2007. Indications for LRN are still being spread, despite it open RN still remains a standard treatment in advanced renal tumours, lymph node involvement and tumour thrombus vein spreading. There have been several advanced renal tumours (cT3a-cT3b) in our cohort.

We treat almost all renal tumours in the region of Plzen, therefore we have a representative spectrum of renal tumours. We have performed 451 radical nephrectomies (RN) in five-year period, 210 (37.7%) open and 231 (62.3%) laparoscopically. The number of LRN has been increasing every year since January 2003. Presence of peroperative and postoperative complications has had a decreasing trend every year. We have proved that operating time can in experienced or even in unexperienced hands with increasing number of procedures significantly shorten.

. We prefer transperitoneal approach in our department. It provides a larger working space and better anatomical and topographical orientation. The choice of approach depends on individual preferences of operator and his experience.

Minimally invasive surgery has become in the treatment of parenchymal kidney tumours at our institution an important part of surgery and was indicated almost in two thirds of renal tumours during the period of 2003-2007. We indicate kidney tumour of clinical stage T1- T2N0M0 (8 -10cm) and in selected cases even advanced tumours (cT3a, cT3b, N+). We prefer transperitoneal approach, extraperitoneal approach is indicated only imperatively (less than 3 % in our department). The more experience the faster operating time and the lower presence of complication and conversions, too. We recommend biphasic CT angiography before surgery in order to gain exact renal vessels imaging. LRN comparing to open surgery

is technically more challenging and more expensive, but patients profit from the advantages of miniinvasivity. Laparoscopy of kidney tumours should be centralized in specialized centres.

A laparoscopic resection of a kidney tumour (LR) compared with an open resection (OR) is technically more difficult and it has some boundaries. Surgeon, who plans LR, has to solve following problems: an indication of tumours for LR, an access (transperitoneal vs. retroperitoneoscopic), operative technique with as short as possible time of warm ischemia and haemostasis. And oncological safety must be preserved as in OR.Indications for LR are from our point of view smaller tumours (to 3-4 cm) well accessible for laparoscopic instruments (mainly lower pole and ventrally located tumours). Some surgeons recommend for dorsally located tumours retroperitoneoscopic approach. We prefer for these tumours transperitoneal approach as well with loosening of kidney and upset of kidney ventromedially. We consider retroperitoneoscopic approach more difficult mainly due to smaller space. In tumours of the upper pole of the kidney, we prefer the open approach.

LR is a technically challenging operation. In spite of broad opinion with laparoscopic renal surgery and open resection as well of surgeon performing LR, rate of serious complications is high (20 %). Laparoscopic approach must be carefully considered. The best choice is small exophytic tumour on the lower pole or ventral part of the kidney. Maximally about one third of tumours indicated to nephron sparing surgery can be treated in this way. The advantage of LR is miniinvasivity, disadvantages are the technical difficulty, longer renal ischemia and higher risk of haemorrhagic complications