

## Laparoscopic versus open surgery live-donor nephrectomy

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### Aim

To assess the safety, efficacy and financial consequences of laparoscopic *versus* open live-donor nephrectomy (the current standard approach).

### Methods

A literature search showed that ASERNIP (Australian Safety and Efficacy Register of New Interventional Procedures-surgical) had published a high-quality systematic review on laparoscopic live-donor nephrectomy (LN) in 2003. The clinical data in their report were summarised with their permission. These data were completed by a search (Jan - Dec 2003) for further trials providing data on any the following endpoints: short- and long-term perioperative donor morbidity, mortality, duration of donor's convalescence, and function and survival of the transplanted kidney. Studies using hybrid techniques or which included a range of indications for surgery were excluded unless results for kidney harvesting could be analysed separately. The comparator procedure was open nephrectomy for transplantation. A systematic search for economic studies (1997-2003) was also performed.

### Results

- (i) *Clinical trials*: A total of 72 clinical trials were included in our report (44 comparative trials, 28 case series). Their level of evidence was average. There was only one randomised controlled trial (quality: average to good). There were 6 non-randomised controlled trials with clearly identified controls, but their validity was limited by lack of information on inclusion or exclusion criteria, case matching and loss of follow-up. The remaining comparative trials used historical controls and thus presented differences in data collection, hospital protocols and the donors' state of health.
- (ii) *Donor safety*: The ASERNIP report did not find any significant difference in donor safety between LN and open surgery. However, a later American survey of 10 828 nephrectomies (47.7% LNs) in 171 centres reported 3 deaths, all after LN. Reoperation was necessary in 0.4% of open, 1% of hand-assisted and 0.9% of non-hand-assisted cases. The difference was significant. According to the ASERNIP report, complications differed according to procedure. The conversion rate for LNs was between 0 and 13%.
- (iii) *Efficacy*: LN seemed to be a longer procedure, with a longer warm ischaemia time, but this did not increase late resumption of renal function in the recipient. For the donor, postoperative convalescence seemed to be better after LN (less parenteral narcotics, earlier resumption of eating and walking, shorter length of hospital stay and less time off work). This could make LN more attractive for potential donors. There was no significant difference between LN and open surgery as regards short-term transplant function and transplant survival. Long-term complications and transplant survival have not been sufficiently assessed and longer follow-up is needed.
- (iv) *Details of surgery*: LN is an evolving technique, but hand-assistance and other developments have not been shown to improve standard LN. Surgical training is a key factor governing success; best results are obtained by teams of trained laparoscopists and transplant surgeons. A specific assessment is needed to define LN conditions in elderly or obese donors, or donors with multiple renal arteries. The right kidney could be used if necessary, provided the team is sufficiently well trained. Further assessment of LN in children is needed.
- (v) *Economic studies*: A total of 18 comparative economic studies were included, but their design quality was too poor to allow a selection checklist to be used. Most reports were descriptive. Costs for LN were higher than for open surgery, mainly because of a longer

operating time and the cost of consumables. However, there was no significant difference in total hospital cost as the hospital stay for LN was shorter. In addition, donors were able to resume daily activities and return to work sooner.

### **Looking ahead**

- (i) Ideally, high-quality randomised controlled trials with long-term follow-up are needed to provide further evidence for the safety and efficacy of LN. However, because such trials are difficult to carry out in surgery, other study designs might have to be used to obtain this evidence.
- (ii) Live-donor nephrectomy puts a medical and psychological burden on otherwise healthy subjects. Rigorous medical and economic studies are needed which should include not only the direct and indirect costs of the procedure, but also the direct and indirect benefits for donors and recipients. Reduced duration of donor convalescence after LN should be assessed to find out whether it counterbalances the increased operative costs.

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