

Executive summary

Laparoscopic Live Donor Nephrectomy (2000 Update)

(Adapted from the report of the Review Group by Ms Tracy Merlin)

Background

With the increasing utilisation of laparoscopic live donor nephrectomy internationally, the aim of this systematic review was to compare the safety and efficacy of laparoscopic, or laparoscopic-assisted, live donor nephrectomy with the “gold” standard of open live donor nephrectomy.

Methods

Search Strategy: Three search strategies were devised to enable literature retrieval from the Medline, Current Contents, Embase and Cochrane Library databases up until, and including, February 2000.

Study Selection: Inclusion of a study was determined on the basis of a pre-determined protocol, independent assessment by two reviewers and a final consensus decision. English language papers were selected and acceptable study designs included randomised-controlled trials, controlled clinical trials, case series or case reports. Each study was required to provide information on at least one of several safety and efficacy outcomes as detailed in the protocol.

Data Collection and Analysis: Thirty-five studies met the inclusion criteria. They were tabulated and critically appraised in terms of the methodology and design, sample size, outcomes, and the possible influence of bias, confounding and chance.

Results

High level evidence comparing the safety and efficacy of laparoscopic, or laparoscopic-assisted, live donor nephrectomy with open donor nephrectomy was not available at the time of this review. Four laparoscopic techniques were described in the literature on live donor nephrectomy: the laparoscopic transperitoneal approach with CO₂ insufflation; the hand-assisted laparoscopic transperitoneal approach with CO₂ insufflation; the laparoscopic-assisted transperitoneal approach using retraction rather than insufflation; and the retroperitoneoscopic-assisted approach using retraction.

Limited low level evidence indicated the following:

Safety: There was no reported deaths in any of the donor groups in any of the controlled studies, case series or case reports. In the largest published donor series (n=338), the conversion rate was 0.9%. The major reason for converting from the laparoscopic to the open procedure was vascular injuries or the inability to control bleeding. The complication rate did not differ significantly for the laparoscopic and open approaches. However, sample sizes were small and differences would have been difficult to detect. The complications that figured prominently in the literature on laparoscopic live donor nephrectomy were haemorrhage and blood transfusion. Most complications and conversions occurred early in the donor series' reported as these laparoscopic techniques have a very steep learning curve and are exceptionally technically demanding. This may have biased the results as most of the published papers presented their early experiences with the laparoscopic techniques. Most of the larger donor series reported fewer complications and conversions after the first 20-30 cases.

Efficacy: In general, warm ischaemia times and operating times were longer for the laparoscopic procedures. However, delayed graft function and long term graft function, as measured by creatinine levels, were essentially the same for grafts harvested using either the laparoscopic or open approach. There were no differences in recipient and graft survival when the laparoscopic and open techniques were compared.

No conclusions could be drawn with respect to the risk of recipient ureteral complications from grafts harvested laparoscopically as opposed to openly. Any increased risk from the laparoscopic approach appears to be a function of learning curve and technique. The laparoscopic approach was found to be advantageous with regard to the donor's hospital stay, convalescence, pain, and resumption of employment.

Conclusion and recommendations

At this early stage in the evolution of laparoscopic live donor nephrectomy, the ASERNIP-S Review Group does not believe that this technique has advantages that would require transplant units to change from the established technique of an open live donor nephrectomy.

However, on the basis of the evidence available, the ASERNIP-S Review Group has issued the following clinical recommendations for Australian surgeons:

1. Laparoscopic live donor nephrectomy should only be done in units where there are surgeons with considerable expertise in open live donor nephrectomy.
2. The live donor nephrectomy surgical team planning to start laparoscopic live donor nephrectomies should include a surgeon with established experience in a range of laparoscopic procedures.
3. Laparoscopic live donor nephrectomy should be done initially in either a large animal or the technique used in a patient requiring a nephrectomy for benign disease.
4. Renal transplant units planning to undertake laparoscopic live donor nephrectomy should plan to do a series of these cases and maintain detailed records of the theatre costs, hospital costs, morbidity and outcome in both open and laparoscopic cases.
5. Surgeons should be alert to the literature on evolving techniques of laparoscopic nephrectomy. Of particular interest is the option to use an extraperitoneal approach instead of a transperitoneal approach.

The ASERNIP-S Review Group has issued a recommendation for the cautious introduction of laparoscopic live donor nephrectomy in Australia where the above skills exist and where there is a commitment to do 10-20 of these cases per year in order to gain the necessary experience and report the results. ASERNIP-S set up a national database in 1999 to house information on safety and efficacy outcomes from the few transplant centres in Australia and New Zealand that are currently undertaking laparoscopic live donor nephrectomy.

Safety and Efficacy Classification

The safety and efficacy of laparoscopic live donor nephrectomy could not be established due to an incomplete and/or poor quality evidence base. It was recommended that a prospective, concurrently controlled clinical trial, ideally with random allocation to the intervention and control group, be conducted to establish the safety and/or efficacy of the procedure.

Review Group Membership

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Important note The information contained in this report is a distillation of the best available evidence located at the time the searches were completed as stated in the protocol. Please consult with your medical practitioner if you have further questions relating to the information provided, as the clinical context may vary from patient to patient.

For further information about ASERNIP-S

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