Laparoscopic radical prostatectomy: accelerated systematic review
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CRD summary
This review compared laparoscopic with open radical prostatectomy for prostate cancer. The authors concluded that there were insufficient data about continence, potency and survival, and that there appeared to be little difference between the types of laparoscopy surgery. This was generally a well-conducted and clearly reported review, and the authors' conclusions reflect the limited evidence from non-randomised trials.

Authors' objectives
To compare the efficacy, safety and costs of laparoscopic radical prostatectomy (LRP) with open radical prostatectomy; to compare transperitoneal laparoscopic radical prostatectomy (TLRP), extraperitoneal endoscopic radical prostatectomy (EERP) or robotic-assisted radical prostatectomy (RALRP) with or without nerve-sparing to open radical retropubic prostatectomy (RRP) or radical perineal prostatectomy (RPP) with or without nerve-sparing; and to determine if there is a learning curve for LRP in patients with prostate cancer.

This abstract only refers to efficacy and safety outcomes.

Searching
MEDLINE, EMBASE, Current Contents, PubMed and the Cochrane Library were searched from 1966 to December 2004. The authors also searched the Centre for Reviews and Dissemination databases, ClinicalTrials.gov, the National Research Register, relevant online journals and the Internet. The search terms were reported and no language restrictions were applied. The reference lists of all retrieved reports were screened.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and other controlled and comparative studies were eligible for inclusion. Median follow-up was 8.1 months (range: 1 to 33.8) for studies of laparoscopic surgery and 11 months (range: 1 to 67) for studies of open surgery. The included studies used both concurrent and historical controls.

Specific interventions included in the review
Studies were eligible if they compared TLRP, EERP or RALRP with or without nerve-sparing to open RRP or RPP with or without nerve-sparing. Studies that compared different types of laparoscopic surgery were also eligible. Studies were included regardless of concomitant lymphadenectomy or pre- or post-operative chemotherapy. Studies that used LRP in combination with other methods were excluded.

Participants included in the review
Studies of patients who had been diagnosed with localised prostate cancer using any method were eligible for inclusion. Studies of patients with advanced or recurrent prostate cancer were excluded.

Outcomes assessed in the review
Studies were eligible if they assessed any of the following outcomes: peri- or post-operative morbidity or mortality; intra-operative or early post-operative outcomes (e.g. operation time, blood loss, blood transfusion, conversion to open procedure, need for analgesia, duration of hospital stay, resumption of oral intake and catheterisation); incontinence; sexual function; quality of life; cancer control measures such as surgical margins, post-operative prostate-specific antigen (PSA) levels, cancer recurrence and survival. The review defined survival as biochemical recurrence-free survival (PSA >0.2 microg/L on more than one occasion). The included studies assessed quality of life using the European Organization for Research and Treatment of Prostatic Cancer Quality of Life Scale, the Medical Outcomes Study 36-Item short form, and the University of California Los Angeles Prostate Cancer Index.
How were decisions on the relevance of primary studies made?
Two reviewers independently selected the studies and any disagreements were resolved by consensus.

Assessment of study quality
The studies were assessed using criteria described in the Cochrane Reviewers’ Handbook. Non-randomised comparative studies were assessed for the methods used to select patients, the comparability of treatment groups at baseline, the completeness of follow-up, and any other aspect of study design or study execution that might have introduced bias. The level of evidence of each study was classified according to the National Health and Medical Research Council’s Hierarchy of Evidence guidelines. Two reviewers assessed the quality of each study and any differences were resolved through discussion.

Data extraction
One reviewer extracted the data and a second reviewer checked the extraction. Data on the number of patients (and percentage) with each outcome of interest in each treatment group were extracted.

Methods of synthesis
How were the studies combined?
The studies were grouped by the interventions compared and outcomes reported and combined in a narrative, and accompanying tables were presented. Where several studies reported similar effects of treatments, the authors reported the median of the means and ranges of values.

How were differences between studies investigated?
Differences between the studies were discussed with respect to study design. The results were also reported separately for pT2 and pT3 tumours, and the influence of margin location on positive margin rates was examined.

Results of the review
No RCTs were found. Thirty comparative studies (n=5,144) were included. Twenty-one studies (n=3,996) compared laparoscopic with open radical prostatectomy and 9 studies (n=1,148) compared the different types of laparoscopic prostatectomy.

Study quality.
Most of the included studies used historical controls, but in most studies the treatment groups appeared to be similar at baseline. The studies did not use standardised outcomes for continence or potency. There was insufficient follow-up to adequately assess recurrence and survival. The duration of follow-up differed for laparoscopic and open surgical procedures.

Open versus laparoscopic surgery.
Conversion to open radical prostatectomy was reported in 20 studies. The median conversion rate was 0% (range: 0 to 20% in 12 studies). Reasons for conversion were rarely reported.

There appeared to be few differences in safety outcomes between open and laparoscopic procedures, but laparoscopic procedures were associated with lower blood loss and lower rates of transfusion.

Five studies found that the estimated blood loss was higher for RRP than for TLRP. One of 2 studies comparing EERP with RRP found significantly higher blood loss with RRP; the other study found no difference between procedures. All 3 studies comparing RALRP with RRP found higher blood loss with RPP.

All 5 studies comparing TLRP with RRP found increased transfusion rates with RRP. One study found significantly more transfusions with RRP compared with EERP. Two of 3 studies comparing RALRP and RRP found more transfusion with RRP (one significantly more); the other study found no difference between procedures.
Laparoscopic procedures were associated with longer operating times than open prostatectomy: all 7 studies comparing TLRP with RRP and all 3 studies comparing EERP with RRP found lower mean operating times with RRP. However, laparoscopic procedures were also associated with a shorter length of stay and duration of catheterisation.

Seven of the 8 studies comparing TLRP with RRP found shorter hospital stays for TLRP; the remaining study found no difference between TLRP and RRP. One study comparing EERP with RRP and 3 studies comparing RALRP with RRP found significantly longer stays with RRP. All 5 studies comparing TLRP with RRP found shorter duration of catheterisation with TLRP. Two of 3 studies comparing EERP with RRP found significantly shorter duration of catheterisation with EERP. Two of 3 studies comparing RALRP with RRP found significantly shorter duration of catheterisation with RALRP.

Results on the use of analgesia varied between studies.

Positive margin rates of laparoscopic and open prostatectomy appeared similar.

Recurrence-free survival was poorly reported but appeared similar between laparoscopic and open prostatectomy.

Continence and potency were poorly reported. The findings suggested that continence may recover more quickly after laparoscopic surgery, whilst potency may recover more quickly after RRP than open prostatectomy.

The 2 studies compared TLRP with RRP found mixed results for continence. The only study comparing EERP with RRP found no important difference between procedures. One of 2 studies comparing RALRP with RRP found markedly faster recovery of continence up to 6 months after RALRP.

One of 2 studies comparing RALRP with RRP found higher rates of erection and intercourse return at 12 months after RALRP.

Quality of life was similar between TLRP and RPP in the 2 studies reporting this outcome.

Comparisons of laparoscopic procedures.

There were no important differences between the laparoscopic procedures.

Learning curve (6 studies).

Studies showed more conversions to open procedures for early compared with later experience (2 studies), a tendency for blood loss to decrease with experience (2 studies), a reduction in transfusions with experience (3 studies), and shorter operating time with experience (4 studies). Length of stay (2 studies), catheterisation (2 studies), positive margin rates (2 of 4 studies), and continence rates at 6 and 12 months (2 studies) did not seem to alter with experience. One study found that increasing experience was associated with faster recovery of potency after EERP.

Cost information

Three studies included an economic assessment of laparoscopic versus open radical prostatectomy, but the costs and use of resources were not well reported in any of the studies. None of the economic models were based on patient-relevant clinical efficacy outcomes. All 3 studies found that laparoscopic surgery was 10 to 30% more expensive than open surgery.

Authors' conclusions

There were insufficient data about continence, potency and survival. There did not appear to be any important differences between different types of laparoscopy surgery. Robotic assistance may shorten operation times and allow quicker recovery of continence and potency than open prostatectomy. There was a clear learning curve for laparoscopic prostatectomy with respect to several clinical outcomes.
CRD commentary
The review addressed a clear question that was defined in terms of the participants, intervention, outcomes and study design. Several relevant sources were searched and attempts were made to minimise publication and language bias. Methods were used to reduce reviewer errors and bias in the study selection, validity assessment and data extraction processes. Validity was assessed using specified criteria.

Despite there being adequate information on the primary studies, it was unclear why some studies that were described in the text were not included in tables of relevant outcomes. Given the nature of the evidence, a narrative synthesis was appropriate. However, the results were not consistently discussed in relation to study quality. The conclusions were based on non-randomised studies in which interventions were compared predominantly with historical controls, and there is the potential for bias resulting from unacknowledged differences between treatment groups. This was generally a well-conducted and clearly reported review, and the authors' cautious conclusions reflect the limited evidence from non-randomised trials.

Implications of the review for practice and research
Practice: The authors stated that surgeons should have previous experience in laparoscopy and/or open radical prostatectomy before undertaking laparoscopic prostatectomy, and that outcomes during the learning phase should be documented.

Research: The authors stated that there is a need for a national audit of LRP (including robotic-assisted surgery) to monitor the introduction of LRP, and that hospital credentialling committees should regularly monitor the progress of surgeons introducing LRP, especially with respect to complication rates and surgical margins in the early stages. The authors also stated that economic evaluations in the Australian health care setting are required.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.