



Title	Laparoscopic Surgery for Inguinal Hernia Repair: Systematic Review of Effectiveness and Economic Evaluation
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Aim

To determine whether laparoscopic methods are more effective and cost effective than open mesh methods of inguinal hernia repair, and whether laparoscopic trans-abdominal preperitoneal (TAPP) repair is more effective and cost effective than laparoscopic totally extraperitoneal (TEP) repair.

Conclusions and results

Thirty-seven randomized controlled trials (RCTs) and quasi-RCTs met the inclusion criteria on effectiveness. The systematic review of economic evaluations included 14 studies. Laparoscopic repair (LR) was associated with an earlier return to usual activities, less persisting pain and numbness, and fewer cases of wound/superficial infection and hematoma. However, it was also associated with longer operation times and a higher rate of serious complications in respect of visceral (especially bladder) injuries. Initially, no difference was found in the hernia recurrence rate, but later inclusion of data from a large trial suggested that recurrences might be slightly more common after laparoscopic surgery. The review found LR to be about GBP 300 to 350 per patient more costly to the health service than open repair. The economic model also suggested that the LR techniques are more costly. Estimates of incremental cost per additional day at usual activities were between GBP 86 and GBP 130. Where productivity costs were included, they eliminated the cost differential between LR and open repair. The economic model showed that the incremental cost per QALY of LR compared with open mesh repair was likely to be less than GBP 20 000.

Recommendations

Open flat mesh appears to be the least costly option for managing unilateral hernias, but provides fewer quality adjusted life years (QALYs) than TEP or TAPP. (On average, TEP appears to be less costly and more effective than TAPP.) In managing symptomatic bilateral hernias, LR appears to be more cost effective. Taking into account possible repair of contralateral occult hernias,

TEP repair is the most likely to be considered cost effective at threshold values for the cost per additional QALY of GBP 20 000, but conclusions are tentative. Laparoscopic techniques may allow patients to return to usual activities faster, and reduce loss of income. For the NHS, greater use of LR would increase the need for training, but perhaps also the risk of serious complications. Assessing chronic pain should be addressed prospectively, using standard definitions to measure the degree of pain. More evidence is needed on the utility loss caused by persisting pain and numbness, and on the risk of surgical complications. This might be best addressed by prospective population-based registries of new surgical procedures to complement randomized trials assessing relative effectiveness.

Methods

Dichotomous outcome data were combined using the relative risk method, and continuous outcomes were combined using the Mantel-Haenszel weighted mean difference method. Time to return to usual activities was described using hazard ratios derived from individual patient data meta-analysis. We updated a review of economic evaluations from 2001 and performed an economic evaluation. This involved estimating cost effectiveness, to compare LR with open flat mesh, using a Markov model with data from the systematic review (time horizon up to 25 years).

Further research/reviews required

- Changes in the balance of advantages and disadvantages when hernias are recurrent or bilateral.
- Methodologically sound RCTs to assess the relative merits and risks of TAPP and TEP.
- Methodological research on the complexity of laparoscopic groin hernia repair and the improvement of performance that accompanies experience.