Laparoscopic varicocele ligation: are there advantages compared with the microscopic subinguinal approach

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The study assessed laparoscopic varicocele ligation (LVL) and subinguinal microscopic varicocelectomy (SMV) for the surgical correction of varicocele.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients who had undergone correction of varicocele. Patients were excluded if any additional procedures, other than LVL or SMV, had been done at the time of the varicocele repair.

Setting
The setting was secondary care. The economic study was carried out in Denver (CO), USA.

Dates to which data relate
The dates to which the effectiveness and resource use data related were not reported. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The cost data were only available for a sub-group of patients that provided the effectiveness evidence.

Study sample
Power calculations were not reported. A total of 72 patients who underwent correction of 84 varicoceles were included in the analysis. These patients were divided in two groups. Group 1 included post pubertal adolescents who had undergone LVL, using a single trocar technique, for Grade III varicoceles because of symptoms or reduced ipsilateral testicular size. Group 2 included adults seen at an infertility practice who underwent SMV. The LVL group comprised 36 patients with a mean age of 13.8 (+/- 2.1) years, while the SMV group contained 36 patients with a mean age of 34.1 (+/- 7.1) years.
Study design
This was a retrospective cohort study. Data for three surgeons at three institutions were reviewed for a period of 6 years. The mean follow-up was 6 months for both groups. No blinding of the outcome assessment was reported. No loss to follow-up was reported.

Analysis of effectiveness
The primary health outcomes assessed in the effectiveness analysis were:

- the operating time from incision to closure,
- persistent or recurrent varicoceles,
- hydroceles,
- atrophy, and
- unexpected emergency department visits.

The authors did not state whether the two groups were comparable at baseline in terms of the demographic and clinical characteristics. Adjustments for confounding factors were not reported.

Effectiveness results
The mean operative time was 34 (+/- 5) minutes in the LVL group and 60 (+/- 9) minutes in the SMV group.

When comparing the operative times for unilateral and bilateral repairs, LVL resulted in decreased operative times in both cases. The mean operative time for unilateral repairs was 34 (+/- 5) minutes for LVL (n=35) and 69 (+/- 11) minutes for SMV (n=26). The operative time for bilateral repairs was 33 minutes for LVL (n=1) and 78 (+/- 8) minutes for SMV (n=10). The difference was statistically significant for unilateral repairs, (p<0.5, 95% confidence interval), but not for bilateral repairs because of the small number of bilateral repairs undertaken.

LVL resulted in three negative outcomes, compared with seven after SMV, (p<0.05, 95% confidence interval). No persistent or recurrent varicoceles occurred in the LVL group, while four occurred in the SMV group. Three hydroceles developed in the LVL group compared with none in the SMV cohort. Three men in the SMV group, but none in the LVL group, required emergency room evaluation. No patients in either group experienced postoperative testicular atrophy, and no testes were lost in either group.

Clinical conclusions
LVL resulted in shorter operative times and fewer negative outcomes than SMV.

Measure of benefits used in the economic analysis
No summary measure of benefit was used. The costs and effects were left disaggregated and the study was, in effect, a cost-consequences analysis.

Direct costs
No details were provided on the categories of costs included in the analysis. Only direct hospital costs to the patient were included; professional fees were excluded. Discounting was not carried out. The quantities and the costs were not analysed separately. The hospital costs were determined from a review of billing records. No discounting was carried out as the costs were incurred during less than one year. The dates and price year were not reported. The average total cost per patient was reported.
Statistical analysis of costs
The costs were expressed as the mean +/- the standard deviation. They were analysed using the t-test.

Indirect Costs
The indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was reported.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The mean direct hospital cost was $3,027 (+/- 242) for the LVL group and $4,363 (+/- 493) for the SMV group, (p<0.5, 95% confidence interval).

Cost data were only available for 29 of the 36 patients in the SMV group.

Synthesis of costs and benefits
Not relevant, as no summary measure of benefit was derived.

Authors' conclusions
Laparoscopic varicocele ligation (LVL) using the single trocar technique resulted in shorter operative times and fewer negative outcomes than subinguinal microscopic varicocelectomy (SMV). This translated into less direct patient costs when the LVL technique was used. For those who have mastered laparoscopic techniques, LVL should be considered as a safe and cost-effective option for the correction of varicoceles.

CRD COMMENTARY - Selection of comparators
The authors did not explicitly justify their choice of the comparator. SMV reflects a potential alternative to LVL in the authors' setting. However, open varicocelectomy was also a potential alternative, but it was not considered in the analysis. You should judge whether SMV is relevant in your setting, or whether other comparators from other techniques could have been relevant as well.

Validity of estimate of measure of effectiveness
The analysis was based on a retrospective sample. This may lead to biases and may limit the validity of the comparison between the two groups. For example, the authors acknowledged that the two populations were quite different and underwent surgery at different hospitals; as such, these confounding factors might have affected the results obtained. Appropriate statistical analyses, to ensure comparability of the patient groups, were not reported. The internal validity of the study is likely to be low given the retrospective nature of the study design, the selection and allocation of the patients, and the lack of any correction for confounding.

Validity of estimate of measure of benefit
The authors did not derive a measure of health benefit. The reader is referred to the 'Validity of estimate of measure of effectiveness' field (above).

**Validity of estimate of costs**

The perspective adopted was unclear. Although the authors reported that patient costs were evaluated, the cost of travel and the lost income from work were not assessed. In addition, professional fees were not included and no justification for their exclusion was provided. The authors did not report any further details on the cost analysis, thus it was unclear whether the additional follow-up required for complications was considered in the analysis. The costs and the quantities were not reported separately, which will hamper the extrapolation of this analysis to other settings. The costs were obtained from patient records. No statistical analysis, sensitivity analysis, or any other analysis of the quantities was carried out, and this limits the generalisability of the results. The price year was not reported, which will prevent any future reflation exercises. Discounting was appropriately not carried out since all the costs were during less than 1 year. Since the authors reported the average total cost per patient, it is not possible to determine whether the difference in costs was due to the longer procedure times required for SMV, the reduction in the need for emergent management in patients undergoing LVL, the increased need for overnight hospitalisation in patients undergoing SMV, or factors relating to equipment.

**Other issues**

The authors made appropriate comparisons of their results with those from other studies. The issue of generalisability was not addressed. The authors’ conclusions reflected the scope of the analysis. The authors did not report any further limitations of their study.

**Implications of the study**

The authors did not make any specific recommendations for changes in policy or practice, and/or the need for further research. An adequately powered, prospective, randomised controlled trial associated with an economic evaluation is needed to confirm the results of this study.

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None stated.

**Bibliographic details**

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**Other publications of related interest**


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