**Microendoscopic surgery: a comparison of four microendoscopes and a review of the literature**

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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**
Four microendoscopes (Medical Dynamics microoptical catheter, Origin Pixie microendoscope, Imagyn Microlap, and Karl Storz microendoscope) were compared to a 5mm conventional laparoscope in microendoscopic surgery.

**Type of intervention**
Diagnosis and treatment.

**Economic study type**
Cost-effectiveness analysis.

**Study population**
Patients scheduled for elective tubal sterilisation or diagnostic laparoscopy.

**Setting**
Hospital. The economic study was carried out in California, USA.

**Dates to which data relate**
Not reported.

**Source of effectiveness data**
Effectiveness data were derived from a single study.

**Link between effectiveness and cost data**
The costing was undertaken on the same patient sample as that used in the effectiveness analysis although it was not reported whether it was performed prospectively or retrospectively.

**Study sample**
Power calculations did not determine the sample size. A group of 27 patients was included in the study. 10 patients underwent surgery with the Medical Dynamics endoscope; 10 patients were treated with Origin; 4 patients underwent surgery using Imagyn and 3 subjects were operated on with Storz. For 5 patients in which endoscopes were not "adequate" the 5 mm laparoscope was used in order to complete the procedure. One surgeon carried out all operations (the author).

**Study design**
The study was a non-randomized trial with concurrent controls, carried out in a single centre. No follow up was required. The allocation of patients to strategies was based on the availability of the equipment. No loss to follow up was reported.

**Analysis of effectiveness**

The principal (intention to treat and treatment completers only) used in the analysis of the clinical outcomes was not reported. The primary outcome used was optical quality which was quantified by an "in vitro" measurement of the diameter of the visual field of each endoscope.

**Effectiveness results**

The visual field at 1mm resolution was:

- for Medical Dynamics, 1.5 cm;
- for Origin, 3.0 cm;
- for Imagyn, 3.0 cm;
- for Storz, 3.0 cm;
- for 5mm, 14 cm.

With respect to the visual field measurement at "clinical" resolution, the results were as follows:

- Medical Dynamics, 4 cm;
- Origin, 10 cm;
- Imagyn, 7.0 cm;
- Storz, 7.0 cm;
- 5 mm, 35 cm.

**Clinical conclusions**

Microoptical catheters are adequate for sterilisation and most diagnostic procedures, including evaluation of the appendix. With advanced endometriosis or pelvic adhesions, a 5mm endoscopic lens provides adequate visualization without the need for larger endoscopes. The 5mm endoscope provides ease of use, optimal sterilisation and the best visibility. Considering that patients have been shown to tolerate endoscopic procedures with 12mm operative endoscopes, the 5mm endoscope should be well tolerated and meet the goals of minimal surgery.

**Measure of benefits used in the economic analysis**

The main benefit measure was optical quality, quantified by an "in vitro" measurement of the diameter of the visual field of each endoscope.

**Direct costs**

Some quantities were analysed separately. Cost items were reported separately. Operating costs and capital costs were measured. The perspective adopted in the cost analysis was not explicitly specified. The quantity and cost estimates were based on actual data. The date for the prices used was not reported. The costs of labour and sterilisation were not included. Learning effects were not relevant according to the author's experience with the technologies.
Indirect Costs
Not considered.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
The visual field at 1 mm resolution was:

for Medical Dynamics, 1.5 cm;
for Origin, 3.0 cm;
for Imagyn, 3.0 cm;
for Storz, 3.0 cm;

for 5 mm, 14 cm. With respect to the visual field measurement at "clinical" resolution, the results were as follows:
Medical Dynamics, 4 cm; Origin, 10 cm; Imagyn, 7.0 cm; Storz, 7.0 cm; 5 mm, 35 cm.

Cost results
The total cost per procedure was: Medical Dynamics $110; Origin, $134; Imagyn, $67; Storz, $51; 5 mm, $34.

Synthesis of costs and benefits
Costs and benefits were not combined since the 5mm option was shown to be the optimal strategy.

Authors' conclusions
Among the microendoscopes, the Imagyn Microlap was considered to have the best combination of field vision, clinical adaptability, ease of operation, mode of sterilisation, and operating cost. The 5mm endoscope provided the best visualization at the lowest overall cost. The latter is the most clinically cost-effective.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear.

Validity of estimate of measure of benefit
The study used a non-randomised design and the sample size may have been too small to detect important differences in effectiveness between the various alternatives. In addition, the number of observations and number of observers were not reported and no definition was provided of "clinical" resolution. These factors may, therefore, have weakened the internal validity of the study.

Validity of estimate of costs
Insufficient details were provided of methods of cost estimation.

Other issues
In view of the lack of randomisation, sensitivity analysis, and statistical analysis of the costs, the results need to be
treated with some caution. The issue of generalisability to other settings or countries was not addressed.

**Source of funding**
None stated.

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