A clinical, radiographic, and cost comparison of cerclage techniques: wires vs cables

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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 examined the use of wires and cables in the cerclage technique that is used in total hip arthroplasty (THA) to secure femoral fractures, allografts and plates.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients who had undergone THA and received either Luque wires or cables around the femoral shaft. The patients had to have at least 1 year’s clinical follow-up to be included.

Setting
The study setting was secondary care. The economic study was carried out in the USA.

Dates to which data relate
The effectiveness data were derived from patients treated between 1986 and 2003. The cost data referred to 2004, which may be assumed to have been the price year.

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

Link between effectiveness and cost data
The cost data were obtained retrospectively from the same patient sample as that used in the effectiveness analysis.

Study sample
The authors did not report any power calculations. Patients were selected by examining hospital records. The authors did not discuss whether the initial study sample was appropriate for the study question. Among the 6,460 patients who underwent THA at the authors’ institution between 1986 and 2003, there were 249 who matched the inclusion criteria. Of these 249 patients, 215 received only wires, 28 received only cable, and 6 received both wires and cables.

Study design
This was a retrospective cohort study that was based at a single centre. Allocation to treatment with Luque wires or
cables was according to the surgeon's preference. The inclusion criteria stated that at least 1 year' follow-up was required, but the authors reported that the mean follow-up was 4.4 years post-operation (range: 0.8 to 15.4). The study was not blinded.

Analysis of effectiveness
The analysis of effectiveness accounted for all patients included in the study (treatment completers). The primary outcomes were the rate of wire or cable breakage, post-operative Harris hip function and pain scores. The authors did not report whether the groups were comparable at baseline.

Effectiveness results
Of the 215 patients with only Luque wires, 11 (5.12%) had at least one break. Of the 28 patients with only cables, 1 patient had a break (3.57%). None of the 6 patients with both wires and cables experienced a breakage.

The total number of wires used in the study was 699 (mean 3.2 per person), of which 12 (1.72%) broke.

The total number of cables used was 109 (mean 3.2 per person), of which 1 (0.92%) broke.

The mean Harris hip function score was 84.8 (range: 34 to 100) amongst patients with only wires and 86.4 (range: 54 to 100) amongst patients with only cables.

The mean pain score was 39.4 (range: 10 to 44) amongst patients with only wires and 40.8 (range: 20 to 44) amongst patients with only cables.

There were no statistically significant differences in the primary outcomes between patients who received only wires and patients who received only cables.

Clinical conclusions
The authors concluded that there was little difference in outcomes when comparing the use of Luque wires with cables in the cerclage technique.

Measure of benefits used in the economic analysis
No summary measure of health benefit was used in the economic analysis. In effect, a cost-consequences analysis was performed.

Direct costs
The study included only the direct costs of the wires and cables. The price data were obtained from a published source but the authors did not describe what the price data represented. Thus, it was unclear whether the prices related to market prices, charges or authors' assumptions. The price data referred to 2004. Discounting was not undertaken.

Statistical analysis of costs
The cost data were not analysed statistically. The authors simply compared the unit costs of the wires and cables and any accessories required.

Indirect Costs
The indirect costs were not included in the analysis.

Currency
US dollars ($).

**Sensitivity analysis**
The authors did not carry out a sensitivity analysis.

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

**Cost results**
The Luque wires cost $29.79 per wire. Their usage required the one-off purchase of a Luque twister at $287.10 and a cable tightener at $3,669.00. The authors did not discuss the effective lifetime of these pieces of equipment.

The cables cost $275.40 per cable.

The authors did not calculate total cost in the study sample.

**Synthesis of costs and benefits**
Not relevant.

**Authors’ conclusions**
Since the wires and cables appear to have performed similarly in terms of their clinical outcomes, then the wires may be preferred due to their lower marginal cost.

**CRD COMMENTARY - Selection of comparators**
The authors compared two surgical devices commonly used in the study setting. You should decide whether Luque wires and cables represent the range of relevant comparators in your own setting.

**Validity of estimate of measure of effectiveness**
The measure of effectiveness was based on a single study. However, the retrospective cohort design does not appear to have been suited to the study question. The authors did not discuss whether the study sample was representative of the study population, but it is likely to have been fully representative of the patients seen in the study setting. The patient groups were not shown to be comparable at analysis, and no attempt was made to adjust for potential confounders. As such, the analysis of effectiveness may be associated with limitations regarding its validity.

**Validity of estimate of measure of benefit**
The authors did not derive a summary measure of health benefit. The study was, in effect, a cost-consequences analysis. The comments in the 'Validity of estimate of measure of effectiveness' field (above) therefore apply.

**Validity of estimate of costs**
The perspective adopted in the analysis was not stated. The authors included only the unit cost per wire and cable, and a one-off cost for accessories required to fit the Luque wires. They made no attempt to calculate the total costs for the study sample. The price year was apparent, but it was unclear whether the price data related to market prices, hospital charges or other types of cost. The numbers of wires and cables used were obtained retrospectively from the patients used in the effectiveness study. The costs and the quantities were reported separately, but the authors did not discuss the effective lifetime of the equipment required to fit the wires, which would have had an impact on the results if taken into consideration.
Other issues
The authors compared their findings with those from other studies. However, the generalisability of the study results to other settings was not addressed. The study did not include a comprehensive cost-effectiveness analysis. No further limitations of the study were reported.

Implications of the study
The authors did not make any recommendations for further research.

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Other publications of related interest
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