Cost-effectiveness of open partial fasciectomy, needle aponeurotomy, and collagenase injection for Dupuytren contracture

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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.

CRD summary
The study investigated the cost-effectiveness of open partial fasciectomy, needle aponeurotomy and collagenase injection (three surgical techniques in the treatment of Dupuytren contracture). The authors concluded that open partial fasciectomy was not a cost-effective strategy compared with needle aponeurotomy and collagenase injection. The less-invasive strategies were cost-effective only under certain circumstances. The paper provided insufficient information to be confident in the results and conclusions.

Type of economic evaluation
Cost-utility analysis

Study objective
The aim of the study was to examine the cost-effectiveness of three surgical techniques in the treatment of Dupuytren contracture: open partial fasciectomy, needle aponeurotomy and collagenase injection. The study population was a hypothetical cohort of adults with functionally limiting contracture involving the small and ring fingers.

Interventions
The study assessed the cost-effectiveness of two new and less invasive treatments – collagenase injection and needle aponeurotomy – compared with conventional open partial fasciectomy for Dupuytren contracture. Collagenase injection involved three injections. Needle aponeurotomy and open partial fasciectomy required anaesthetic. A no treatment option was assessed for costs and benefits.

Location/setting
Sweden/secondary care.

Methods
Analytical approach:
A decision-analytic model was used to synthesise evidence from a selection of relevant published studies and direct measures of patient utility data. The authors stated that the perspective was societal. The time horizon was 20 years.

Effectiveness data:
The results of the sensitivity analyses indicated that there was a clinical parameter termed the success rate, but this was not defined. No estimates for success rates were reported. Instead, threshold analysis was performed to determine which rates resulted in a surgical procedure being cost-effective. Estimates of recurrent and complication rates were included in the analysis. The authors performed a systematic literature review to obtain recurrence and complication rates (15 relevant published studies). Chronic regional pain and digital nerve injury were each assumed to occur in 5% of the cohort.

Monetary benefit and utility valuations:
Utilities were measured directly using a standard gamble survey designed for this study. Thirteen items were examined based on scenarios in the decision analytic model. Members of the general public aged 50 to 80 years were participants for the surveys.

Measure of benefit:
The measure of benefit used was average quality-adjusted life-years (QALYs).

Cost data:
Direct medical costs included surgical procedure, facility costs, anaesthesia time and values, therapy visits and splints. Cost values were derived from 2009 Medicare records and CPT (Current Procedural Terminology) codes. Prices were presented in US dollars ($).

Analysis of uncertainty:
The model parameters were examined with one-way sensitivity analyses on key parameters such as recurrence and complication rate, costs of various hand therapies, costs of anaesthesia, facility fees and collagenase. One-way sensitivity analyses were presented in line graphs for selected parameters.

Results
Compared to no treatment, the cost per QALY gained for open partial fasciectomy was $820,114, $96,474 for needle aponeurotomy and $51,431 for collagenase injection (at a base cost for collagenase of $1,000). Mean QALYs gained were 0.08 for successful open partial fasciectomy, 0.11 for needle aponeurotomy and 0.13 for collagenase injection. Recurrence rates were 12% to 39% for open partial fasciectomy, 50% to 58% for needle aponeurotomy and 10% to 31% for collagenase injection.

The findings from the one-way sensitivity analyses when variations to key parameters were applied was that the model was sensitive to some costs, success and recurrence rates. Needle aponeurotomy was cost-effective at a threshold of $50,000 per QALY gained only when the success rate was near 100% or when performed in an outpatient setting. Collagenase injection was only cost-effective when it was priced under $945 (the price at the time of the review was $5,400 for an average course of treatment).

Authors' conclusions
The authors concluded that open partial fasciectomy was not a cost-effective strategy compared with needle aponeurotomy and collagenase injection, which were cost-effective only under certain conditions.

CRD commentary
Interventions:
The three strategies were not described in detail. Decisions on whether or not the three procedures were appropriate substitutes for each other needed to take into consideration their safety profiles and approval for use in the particular setting.

Effectiveness/benefits:
Details of the clinical studies within the large systematic review used for the economic model were not provided so it was difficult to assess the quality of the clinical estimates. It would be necessary to refer to these separate publications to assess the internal validity and applicability to a population of interest. The systematic review involved results from randomised controlled trials with direct comparisons of the surgical strategies in addition to case series. There was no indication that benefits were discounted despite a 20-year time horizon for the analysis.

The authors conducted a utility survey of surgical outcomes and it seemed that the relevant clinical outcomes were valued.

Costs:
Unit costs were presented clearly in the report. Comparative resource quantities for the three strategies were reported. Costs were based on publicly available sources. Costs for surgical training and education and follow-up consultations were omitted from the study; the additional cost burden and any impact on cost-effectiveness estimates were uncertain. There was no indication that costs were discounted despite a 20-year time horizon for the analysis.

Analysis and results:
The authors highlighted some limitations of their study, such as the three interventions may not be perfectly interchangeable and that some cases may only be addressed with open partial fasciectomy. They discussed the high variability of recurrence rates in the literature. The results were not presented clearly enough to tell whether an
incremental cost-effectiveness analysis was conducted.

Concluding remarks:
The validity of the data estimates used in the model was unclear. The methods and results were not fully transparent. The paper provided insufficient information to be confident in the results and conclusions.

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