Diagnostic accuracy and charge-savings of outpatient core needle biopsy compared with open biopsy of musculoskeletal tumors

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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
Core needle and open biopsy for soft tissue mass or bone tumour with soft tissue extension.

Type of intervention
Diagnosis.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with a soft tissue mass larger than 4cm in diameter, a malignant-appearing bone lesion with palpable soft tissue extension or a suspected recurrence of soft tissue tumour.

Setting
Hospital. The economic study was carried out in Chicago, Illinois, USA.

Dates to which data relate
The main effectiveness data were taken from clinical trials conducted in 1992-94 and in 1989-91. Resource and cost data were mainly derived from 1989-94 sources. The price year was not stated.

Source of effectiveness data
Estimates of the final histological diagnoses and overall diagnostic accuracy were taken from a single study.

Link between effectiveness and cost data
The costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.

Study sample
The study sample comprised a cohort of 62 patients who were managed with a closed core needle biopsy and a cohort of 50 who had had an open biopsy one year before the prospective study began. Power calculations to determine the sample size were not given.

Study design
The study was a case series with historical controls. The duration of the follow-up was 22 months for the trial with core needle biopsy and 21 months for the trial with open biopsy. The loss to follow-up was not stated.
Analysis of effectiveness
The analysis of the clinical trial was based on treatment completers only. The primary health outcomes used in the analysis were the final histological diagnoses and overall diagnostic accuracy.

Effectiveness results
Patients in the core needle biopsy group were estimated to have primary malignant tumours (26), benign tumours (11), metastatic tumours (2), recurrent lymphoma (1) and non-tumourous lesions (3). The remaining 19 patients were managed non-operatively (17) or were operated on elsewhere (2). The overall diagnostic accuracy of the core needle biopsies was estimated to be 84%. Patients in the open biopsy group were estimated to have primary malignant tumours (28), benign tumours (9) and inflammatory lesions (2). The remaining patients were managed non-operatively (9) or were treated elsewhere (2). The overall diagnostic accuracy of the open biopsy was estimated to be 96%.

Clinical conclusions
The core needle biopsy has an acceptable but lower rate of accuracy compared with open biopsy, especially for soft-tissue tumours, and it should be used only in a small subset of patients.

Measure of benefits used in the economic analysis
The authors did not determine a summary benefit measure. As the intervention and comparator had statistically similar outcomes the main benefit was reduction of costs.

Direct costs
Initial visit to clinic, surgeon's professional fee, preoperative tests, anaesthesia, operating room, recovery room and pathology costs were included in the analysis. Quantities and costs were analysed separately. Discounting was not applied. The quantity/cost boundary adopted was that of the hospital. The price date was not stated.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was reported.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The total hospital charges were $1,106 for the core needle biopsy group and $7,234 for the open biopsy group.

Synthesis of costs and benefits
Not applicable. An incremental analysis was not performed.

Authors' conclusions
Core needle biopsy can be performed in an outpatient clinic with use of local anaesthesia and is substantially less expensive and more convenient than open biopsy.
CRD COMMENTARY - Selection of comparators
The reason for the choice of comparator is clear. Closed needle biopsy has become a more widely used alternative to open biopsy.

Validity of estimate of measure of benefit
The estimate of measure of benefit used in the economic analysis is likely to be internally valid. The data have not been used selectively to compare the accuracy of the core needle and open biopsy.

Validity of estimate of costs
Adequate details of the methods of quantity/cost estimation were given and important cost items do not appear to have been omitted.

Other issues
The authors' conclusions are likely to be justified, although no sensitivity analysis was conducted to test for uncertainties in the data. The issue of generalisability to other settings was not addressed, although appropriate comparisons were made with other studies. The results were not presented selectively. A synthesis of the estimated benefits and costs could have been provided. A single benefit measure would have enabled a cost-effectiveness ratio to be calculated for each strategy and this would have enhanced the validity of the economic evaluation.

Source of funding
No funds were received in support of this study.

Bibliographic details

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Ambulatory Care /economics; Biopsy /economics; Biopsy, Needle /economics /methods; Bone Neoplasms /pathology; Comparative Study; Humans; Outpatient Clinics, Hospital /economics; Prospective Studies; Soft Tissue Neoplasms /pathology

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