Detection of cervical metastasis: a meta-analysis comparing computed tomography with physical examination

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Authors' objectives
To compare the accuracy of computed tomography (CT) with physical examination (PE) in the detection of cervical metastasis.

Searching
MEDLINE was searched from 1980 to 1995 for English language literature, using the terms 'lymph node' and 'computed tomography'. The reference lists of identified articles were also examined.

Study selection
Study designs of evaluations included in the review
No inclusion criteria relating to the study design were specified. No details of the study designs included were reported.

Specific interventions included in the review
Studies comparing CT and PE were eligible for inclusion. No further details of the CT technique or PE were specified in the inclusion criteria, or reported for the included studies.

Reference standard test against which the new test was compared
No inclusion criteria relating to the reference standard were specified. In all cases, the reference standard was histopathologic examination of surgical specimens.

Participants included in the review
No inclusion criteria relating to the study participants were specified. The review appeared to include patients with head and neck cancer, considered at risk for metastases.

Outcomes assessed in the review
The authors stated that 'all studies with appropriate data availability were included'; this was not further defined. The outcome measures in the review were the sensitivity, specificity and accuracy; necks were compared for positivity or negativity rather than for the actual nodal staging.

How were decisions on the relevance of primary studies made?
Three of the four reviewers independently selected studies that directly compared CT with PE.

Assessment of study quality
The studies were classified as prospective or retrospective. Three of the four reviewers independently reviewed each study.

Data extraction
Multiple-observer independent extraction was used to extract the data.

Methods of synthesis
How were the studies combined?
The methods used to combine the studies were not described. Fisher's exact test was used to compare the pooled estimates of diagnostic performance between CT and PE.
How were differences between studies investigated?
Sensitivity analyses were carried out: the comparisons were of prospective versus retrospective studies, and of studies using a CT size criterion of 10 mm for defining malignant adenopathy and those using a 15-mm criterion.

Results of the review
Twelve studies (647 neck dissections) were included; 11 studies identified from the literature search, and the authors' own study.

The results of the sensitivity analyses showed no significant differences in diagnostic performance criteria between prospective and retrospective study designs, or between the two diagnostic thresholds for CT assessed.

The sensitivity was 83% for CT versus 74% for PE (P=0.002). The specificity was 83% for CT versus 81% for PE (non significant, P=0.7). The accuracy was 83% for CT versus 77% for PE (P=0.006). The combined sensitivity of PE and CT (positive result defined as either examination positive) was 91%, (data derived from 10 of the included studies).

Cost information
The cost of ultrasonography, which is also used for imaging cervical nodes, was reported to be similar to CT and ranged from US$205 to $625.

Authors' conclusions
CT was a more sensitive indicator of cervical metastasis than PE. These diagnostic modalities are additive, with CT significantly enhancing the detection rates of PE alone. All patients at risk for cervical metastasis should have CT or equivalent radiographic imaging performed prior to the therapeutic intervention. Future studies correlating CT detection rates to the primary site and staging are needed before more specific conclusions can be drawn.

CRD commentary
The review neither clearly stated a research question (though one can be inferred), nor defined the inclusion criteria. The limitation of the literature search to a single database and English language publications make it likely that relevant publications were missed. No consideration was given to the identification of unpublished studies (beyond the authors' own) and publication bias, although discussed, was not formally assessed. There was little information about the individual studies included in the meta-analysis, or about the review methods overall. The lack of any description of the methods used to combine the studies is of particular concern. Given the lack of detail on the included studies, it is difficult to assess the adequacy of the investigation of heterogeneity. However, it seems unlikely that all or even most of the obvious potential sources were addressed. The authors' conclusions seem overly generous towards CT, given the data presented and the limitations outlined.

Implications of the review for practice and research
Practice: The authors stated that all patients at risk for cervical metastasis should have CT or equivalent radiographic imaging performed prior to the therapeutic intervention.

Research: The authors stated that future studies correlating CT detection rates to the primary site and staging are needed before more specific conclusions can be drawn.

Bibliographic details

PubMedID
Indexing Status
Subject indexing assigned by NLM

MeSH
Head and Neck Neoplasms /pathology; Humans; Lymph Nodes /pathology; Lymphatic Metastasis /diagnosis /radiography; Neck; Neck Dissection; Neoplasm Staging; Physical Examination; Sensitivity and Specificity; Tomography, X-Ray Computed

AccessionNumber
11997000262

Date bibliographic record published
30/04/2004

Date abstract record published
30/04/2004

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.