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Systematic review on ultrasonography guided FNAC in detection of regional lymph node metastasis in head and neck carcinoma.

systematic review

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Introduction

Regional metastasis to the cervical lymph nodes is one of the most important tumour related prognostic factors in head and neck carcinoma. The risk of occult neck node metastasis can be reduced by an accurate staging method, provided ultrasonography guided fine needle aspiration cytology (USG-FNAC) is able to detect significant percentage of small non-palpable lymph node metastasis. The neck has traditionally been assessed by clinical examination, but studies that compared clinical examination with histology have shown that clinical examination of the neck for lymph nodes has a low sensitivity and specificity with false negative results ranging from 15%-25%. The detection of a small lymph node of 1 cm3 or less is easily missed out on clinical examination which may have billions of tumour cells. USG-FNAC has been used as an accurate technique for the assessment of the clinically undetectable lymph node metastasis (N0). The importance of systematically reviewing USG-FNAC in head and neck cancer were to upstage of N0 neck thus ensuring timely treatment and provide more certainty that the neck is really free of metastasis.

Objectives

Review the published literature of assessment of head and neck carcinoma with or without clinically detectable regional cervical lymph nodes using USG-FNAC using QUality Assessment of Diagnostic Accuracy Studies (QUADAS) tool.

Fig. 1: Lip carcinoma

Fig. 2: Palatal carcinoma

Fig. 3: Carcinoma of orofacial region (buccal mucosa, skin)

Fig. 4a: USG of parotid tumour (a)

Fig. 4b: USG of parotid tumour (b)

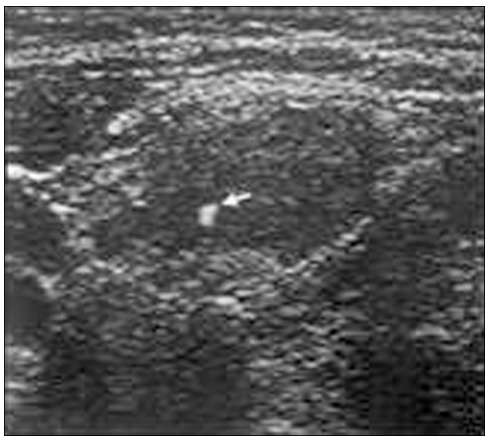

Fig. 4c: USG of parotid tumour (c)

Material and Methods

Materials:

Indexed sites and non indexed journals were used to identify published data for the studies on USG-FNAC in head and neck carcinoma. Thirty-five such published articles were retrieved and reviewed.

Criteria for considering studies for this review:
The search was not limited to any particular type of study design (i.e. randomized controlled trials) however, we employed certain filters, namely:
a.studies of diagnostic accuracy in head & neck carcinoma cases.
b.ultrasonography guided FNAC performed to assess the lymph node status
Ultrasonography guided FNAC is evaluated as a single test against an acceptable reference standard method (histopathology). CT & MRI comparative studies were not included.

Criteria for not considering studies:
Studies that address specific anatomical, metabolic aspects of USG-FNAC.
Studies that focus on specific technical aspects of ultrasonography.

Search methods for identification of studies:

Electronic searches
Cochrane Library (until March, 2008)
MEDLINE (until March, 2008)
CANCERLIT (until March, 2008)

Other sources
Hand searching on Non Indexed Indian journals

Reference lists
Additional studies by searching the reference lists of included trials and systematic reviews identified.

Methods:

Selection of studies:
Two reviewers (JR and AS) independently assessed the titles and abstracts of reports of trial identified by the electronic search. Full text hard copies were obtained for studies that appeared to fulfill the selection criteria and for studies where there was any doubt. Inter-rater agreement for study selection was measured using the kappa statistics. In case of discrepancy, the opinion of the third reviewer (SKN) was sought in order to reach a consensus.

Data extraction and management:
Data were independently extracted by the reviewers and cross-checked. A standard data extraction form was used, collection the key data (methods, participants, interventions, outcomes, results and notes).

Assessment of methodological quality of included studies:
Two reviewers (JR and AS) assessed the methodological quality of each included study using the QUality Assessment of Diagnostic Accuracy Studies (QUADAS) tool developed by the NHS Centre for Reviews and Dissemination at the University of York, UK. The QUADAS is structured in 14 questions, each of which should be answered "yes", "no", or "unclear" and aim at evaluating the presence of spectrum bias, bias associated with the choice of reference standard, disease progression bias, verification bias, review bias, clinical review bias.

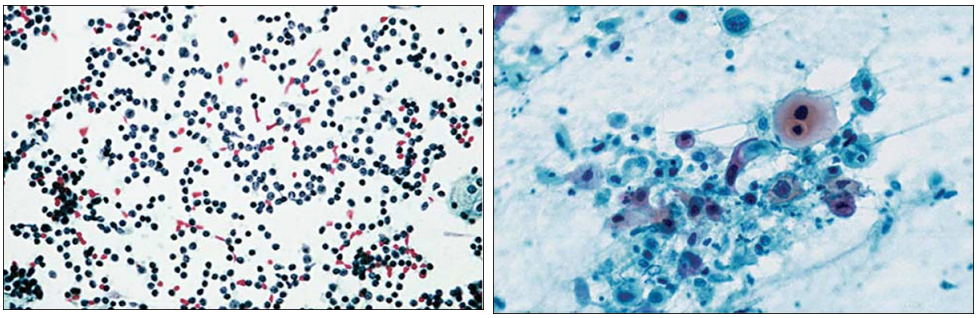

Fig. 5a-b: Fine needle aspiration cytology findings

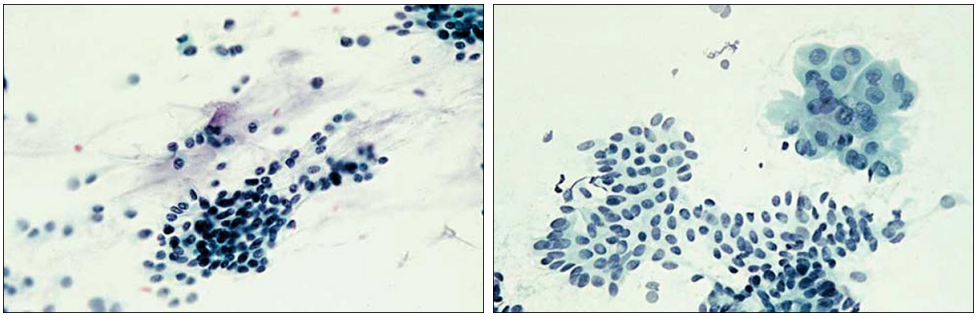

Fig. 5c-d: Fine needle aspiration cytology findings

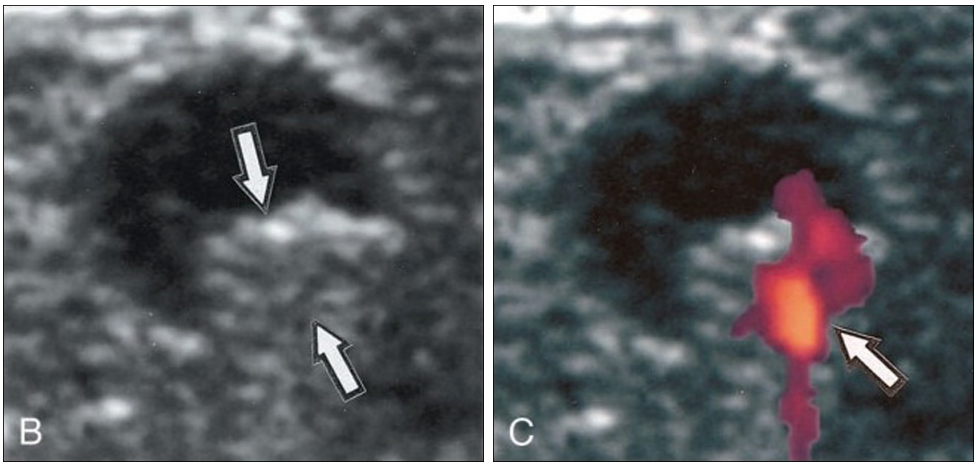

Fig. 6a-b: Doppler ultrasonography for regional lymph node metastasis

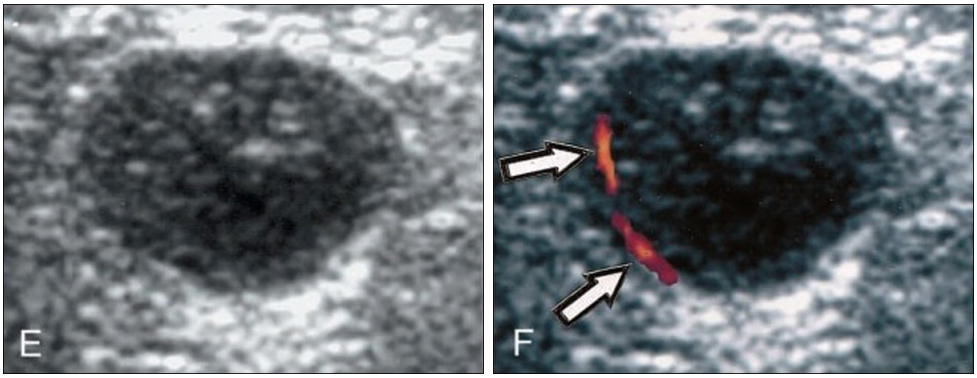

Fig. 6c-d: Doppler ultrasonography for regional lymph node metastasis

Results

Out of 35 retrieved articles, 10 fulfilled the inclusion criteria and were subjected to review using the QUADAS tool. Inter-rater agreement for selection of articles was 0.91. Inter-reviewer agreement for assessing the methodological quality of each included study ranged from 0.8 to 1.0. Six of the studies were retrospective and 4 were prospective. All the studies reported the total number of patients involved in the study and most of the studies also reported their age and sex. In place of conventional ultrasonography, Chikui et al 2000 and Eida et al 2003 assessed the lymphnodes with Power Doppler Sonography and Hayashi et al 2003 and Eida et al 2003 also used CT. Five studies also assessed the cytological findings of the lymphnodes. Evaluation of USG-FNAC showed the following ranges: sensitivity 58% - 89.2%, specificity 87% - 100% and accuracy 80% - 100%.

Literature

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Abbreviations

USG-FNAC – UltraSonography Guided Fine Needle Aspiration Cytology
QUADAS – QUality Assessment of Diagnostic Accuracy Studies
LN – Lymph Node
CT – Computerized Tomography
MHz – Mega Hertz
IV – Intra Venous
Hz – Hertz
ml/s – milliliter per second
mm – millimeter
kVp – kilo voltage potential
mA – milliampere

This Poster was submitted by Dr. Jyotsna Rimal.

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