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Main Article

How good are we at fine needle aspiration cytology?

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Abstract

Objectives: To determine the accuracy of fine needle aspiration cytology conducted within a standard ENT out-patients service (rather than a one-stop neck lump clinic), and also to assess the value of ultrasound guidance during fine needle aspiration cytology.

Design: Retrospective study of all patients undergoing fine needle aspiration cytology of a neck lump, from 2005 to 2008 in Leeds teaching hospitals.

Main outcome measures: Accuracy of fine needle aspiration cytology, compared with the corresponding histology report of the original surgical specimen, and non-diagnostic fine needle aspiration cytology rates with and without ultrasound.

Results: Fine needle aspiration cytology yielded the following respective sensitivity, specificity and accuracy rates: 85, 91 and 87 per cent for lymph nodes; 80, 93 and 89 for salivary glands; and 52, 80 and 69 for thyroid. The proportion of non-diagnostic procedures was 28 per cent, both with and without ultrasound guidance.

Conclusion: Cytologist-led fine needle aspiration cytology would have reduced the time to diagnosis and the number of clinic visits per patient. Fine needle aspiration cytology was accurate for predicting malignancy in salivary gland and lymph node lesions, and for diagnosing lymph node pathology. Study results did not support the use of ultrasound guidance during fine needle aspiration cytology.

Key words: Cytology; Thyroid Gland; Salivary Glands; Lymph Nodes; Ultrasonography

Introduction

In 2004, the UK National Institute for Health and Clinical Excellence (NICE) published a document entitled *Improving Outcomes in Head and Neck Cancer*. This provided guidance on future planning, commissioning and configuration of head and neck cancer services.[1] It proposed that 'one-stop' clinics should be in place by 2008, and that cytologist-led fine needle aspiration cytology (FNAC) should be available as a diagnostic tool within such clinics. However, at the Leeds Teaching Hospitals NHS Trust head and neck cancer centre, no such one-stop clinic had been established.

The aim of this study was to determine the diagnostic accuracy, for neck lumps, of FNAC carried out within a normal ENT out-patient clinic, where FNAC was undertaken by the surgeon seeing the patient. A secondary aim was to assess the value of ultrasound guidance during FNAC 28 per cent of FNACs were reported as non-diagnostic both with and without ultrasound guidance (Figure 1).

Materials and methods

Data were collected retrospectively for all patients undergoing FNAC of a neck lump from 2005 to 2008 within Leeds Teaching Hospitals NHS Trust, in all head and neck specialties. These data were obtained from the trust histopathology computer system. From the clinical data on the request form, the lumps were divided into lymph node, salivary gland or thyroid. The corresponding histology report for those patients who had undergone subsequent surgery was used as the 'gold standard' with which to ascertain the accuracy of the FNAC result.

Results and analysis

A total of 923 FNAC procedures were identified, performed on 738 patients, with 305 corresponding histology samples.

Eighteen per cent of patients required multiple FNAC procedures to establish a diagnosis.

Table I shows the success of FNAC in predicting malignancy, for each neck lump type.

Table II shows the proportion of correct FNAC diagnoses for each neck lump type.

Discussion

Eighteen per cent of our patients required multiple FNACs to establish a diagnosis, requiring repeated clinic visits. This proportion would have been reduced if FNAC had been performed by a cytologist in a one-stop neck lump clinic, as the procedure could

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TABLE I

SUCCESS OF FNAC IN PREDICTING MALIGNANCY, BY NECK LUMP TYPE

Lump type	Sens	Spec	PPV	NPV	Acc
Lymph node	85	91	96	68	87
Salivary gland	80	93	80	93	89
Thyroid	52	80	64	71	69

Data represent percentages. FNAC = fine needle aspiration cytology; sens = sensitivity; spec = specificity; PPV = positive predictive value; NPV = negative predictive value; acc = accuracy

TABLE II

CORRECT FNAC DIAGNOSES* BY NECK LUMP TYPE

Lump type	Correct diagnosis (%)
Lymph node	74
Salivary gland	31
Thyroid	17

*Compared with histology results for surgical specimen.

be repeated during the same clinic appointment if non-diagnostic. At the time of the study, we had to wait two weeks on average for histology results; thus, more accurate FNAC would also reduce the time taken to establish the diagnosis. Cytologist-led services have been shown to be successful: Courtney reported a resulting increase in diagnostic FNACs from 50 to 90 per cent, and Kishore *et al.* reported a 97 per cent incidence of diagnostic FNAC.[2,3]

- **In this study, fine needle aspiration cytology (FNAC) enabled accurate prediction of malignancy in salivary gland and lymph node lesions, and accurate diagnosis of lymph node pathology**
- **Study findings did not support the use of ultrasound guidance to reduce the incidence of non-diagnostic FNAC**

The current study found that FNAC was a useful diagnostic tool for predicting malignancy in lymph node and salivary gland pathology, but was less accurate for thyroid pathology. In addition, FNAC was satisfactory for predicting lymph node diagnoses.

Our results are comparable to other published findings. Howlett *et al.* assessed 712 FNAC procedures in 647 patients over a one-year period and found respective sensitivities and specificities, of 89 and 57 per cent for lymph nodes, 64 and 100 per cent for salivary glands, and 62 and 86 per cent for thyroid tissue.[4]

The current study results do not support the use of ultrasound guidance to reduce the incidence of non-diagnostic neck lump FNAC procedures. This conflicts with other published findings. Robinson *et al.* stated that ultrasound guidance, used by an experienced cytologist, could improve the diagnostic yield for neck lumps, and reported a resulting 84 per cent reduction in the incidence of inadequate specimens.[5] However, this study assessed ultrasound-guided FNAC for all neck lump

FIG. 1

Incidence of non-diagnostic fine needle aspiration cytology procedures, by presence or absence of ultrasound guidance.

types. As a department, we mainly request ultrasound guidance for FNAC of thyroid lumps, which have a high non-diagnostic rate, as shown by Addams-Williams *et al.*; these authors claimed a 22 per cent improvement in the incidence of non-diagnostic FNAC for non-thyroid neck lumps, due to ultrasound guidance.[6]

Conclusion

This study highlights the fact that, despite NICE recommendations, some UK ENT departments still do not have a one-stop head and neck cancer clinic, and that these departments' FNAC results are therefore similar to those published several years previously.

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