Use of core biopsy in diagnosing cervical lymphadenopathy: a viable alternative to surgical excisional biopsy of lymph nodes?

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ABSTRACT

OBJECTIVES Lymphoma often presents with a neck mass and while fine-needle aspiration cytology may be suggestive, tissue biopsy is required for reliable diagnosis and classification of a lymphoma that is sufficient to deliver the correct treatment for the patient. Traditionally, excisional biopsy of a lymph node has been the standard method of tissue sampling, providing ample tissue for assessment. However, this requires theatre time, and preceding fine-needle aspiration cytology, which may incur a delay. With careful use of tissue, coupled with advances in immunohistochemical and molecular investigative techniques, core biopsy provides a possible alternative to traditional fine-needle aspiration and excisional biopsy. In this study, we aimed to determine the efficacy of diagnosing neck masses.

METHOD A retrospective analysis was performed of patients being investigated for a neck mass who were undergoing ultrasound-guided core biopsies of cervical lymph nodes over a 17-month period. The final histology report was scrutinised to assess whether adequate tissue was obtained to allow for full tissue diagnosis.

RESULTS Over the 17-month period analysed, 70 patients with cervical lymphadenopathy underwent core biopsy. Of these, 63 (90%) were diagnostic for either lymphoma or other pathology and did not require further tissue sampling. Overall, 19 patients were diagnosed with lymphoma, of which only 1 required further biopsy due to inconclusive initial core biopsy.

CONCLUSIONS Current guidelines for investigating lymphomas require that excisional biopsy be performed to obtain ample tissue to allow full nodal architecture assessment and ancillary investigation to reach an accurate histological classification. Within our head and neck multidisciplinary team, however, it is considered that results from core biopsies can be obtained in a more timely fashion and with histological accuracy equal to those of open biopsy. The results obtained demonstrate that core biopsy is an effective tool for investigation. We believe this should be the first-line investigation of choice, as it reduces the need for patients to undergo surgery, is more cost effective and offers a faster diagnosis.

KEYWORDS

Lymph node – Excisional biopsy – Core biopsy

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Introduction

Patients with neck masses usually undergo ultrasound scanning of the neck as a first-line investigation, often coupled with fine needle aspiration cytology (FNAC). In some cases, such as metastatic squamous cell carcinoma or granulomatous disease, complete diagnosis may be obtained from the FNA sample. Those that have not been diagnosed by FNAC then usually proceed to excisional lymph node biopsies.

If there is a concern of lymphoma as a potential diagnosis, FNAC will not suffice, as intact tissue is required to assess architecture, as specified in guidelines outlining

investigation of lymphoma.^{1,2} Accurate diagnostic classification of the lymphoma is mandatory as the management differs significantly between types. Traditionally, classification of a lymphoma presenting with a neck mass has required surgical excision of a whole lymph node to provide enough tissue for analysis. However, centralisation of haematopathology services, with access to an extensive panel of immunohistochemical markers and molecular techniques, improved diagnostic expertise and careful use of tissue, has allowed confident diagnosis to be made with less tissue.

As less tissue is potentially required, core biopsies may now be a viable alternative for the investigation of possible

lymphomas. There remains an ongoing debate regarding the role of core biopsy versus excisional biopsy. It is recognised that, despite the recent diagnostic advances, the relative lack of architectural assessment in core biopsies may result in difficulty in some cases, particularly in low-grade non-Hodgkin lymphomas and those with aberrant profiles.

Core needle biopsy involves sampling tissue with a wider gauge needle than is used for FNAC (usually a 16-gauge vs a 23-gauge needle). This results in sampling a 'core' of tissue from the area of interest with minimal distortion of tissue architecture, which allows the pathologist to comment on the histology. The narrower gauge needle used for FNAC does not preserve this architecture, so only a cytological analysis can be offered on aspirated material and it is therefore not suitable for lymphomas.

In our department, core biopsies have recently been used as an alternative to excisional biopsies as it was considered that they would provide comparable information to excisional biopsies but with less risk to the patient (e.g. wound infection, scarring, bleeding, accessory nerve damage) and at a lower cost to the hospital. It also offers a faster turnaround for diagnosis, as patients do not need to be placed on a waiting list for surgery. In our department, core biopsy can be performed on the same day as presentation to our one-stop neck lump clinic. Biopsies are processed urgently in the local laboratory, with each core placed in a separate cassette to maximise the use of tissue. The haematoxylin and eosin stain (H&E) is assessed by the local pathologist and if the sample is adequate and there is likely to be a haematolymphoid diagnosis, the tissue blocks are forwarded to the regional haematopathology service for further workup.

This study was conducted to ascertain whether core biopsies might replace excisional biopsy as a first-line investigation for possible lymphoma with a neck mass and second-line investigation for other malignancies.

Methods

A retrospective review of all patients with a cervical mass undergoing core biopsy under ultrasound guidance over the preceding 17 months was conducted. This represented the start of our department using core biopsies as a first-line investigation. Patients with a clinical suspicion of lymphoma underwent core biopsy with a 16-gauge Carefusion Temno biopsy needle as an initial investigation. Those who presented with a cervical mass without clinical suspicion of lymphoma underwent either FNAC as the first-line investigation, followed by core biopsy or, if the radiologist considered that the scan was suggestive of lymphoma, a core as the first line. The ultrasound scans were performed by one radiologist (SD) with an interest in the head and neck who regularly performs neck ultrasounds. Results of biopsies were analysed to ascertain whether the biopsy was diagnostic (i.e. the patient did not require further tissue harvesting for diagnosis) and what the diagnosis was. The period examined was from December 2013 to April 2015.

Table 1 Diagnoses of diagnostic and nondiagnostic samples

Samples	Patients	
	(n)	%
<i>Diagnostic</i>		
Lymphoma and leukaemia	17	27
Granulomatous lymphadenitis	11	17.5
Metastatic squamous cell carcinoma	11	17.5
Other malignancy	10	16
Follicular hyperplasia 'reactive'	8	13
Benign neoplasm	3	5
Branchial cyst	1	2
Histiocytic lymphadenitis	1	2
Total	63	100
<i>Nondiagnostic</i>		
Granulomatous lymphadenitis	4	55
T-cell lymphoma	1	15
SLE lymphadenitis	1	15
Lost to follow-up	1	15
Total	7	100

Results

A total of 70 patients underwent ultrasound guided biopsies over the 17-month period for cervical neck masses. Sixty-three (90%) of these were diagnostic: a full diagnosis was given from this initial core and the patients did not require any further tissue biopsies (Table 1). Seven of the seventy (10%) were non-diagnostic and required further biopsies (Table 1). There was a high rate of malignancy within the samples; 39 (62%) of the diagnostic samples revealed the mass to be malignant. Of the seven samples that were non-diagnostic and who required further biopsies, the end diagnoses are outlined in Table 1. Overall, there were 19 diagnoses of lymphoma in this series. Eighteen of these were fully diagnosed (including type) from the initial core biopsy and did not require further tissue for histology. One case had an inconclusive diagnosis on core biopsy and required further tissue. Thus core biopsies in our series provided a diagnosis in 95% cases of lymphoma.

Discussion

The model of care that is offered in our district general hospital for investigation of cervical masses relies heavily on our department having close links with the local cellular pathology department and regional haematopathology services. The latter have been centralised to a large teaching hospital, offering a full range of diagnostic investigations

and expertise for lymphoma histological analysis. In our model, tissue is sampled from the patient and then processed locally with routine H&E sections cut from each block. Cases demonstrating metastatic carcinoma or granulomatous disease are reported locally. Those with an initial assessment favouring lymphoma are not subjected to further local diagnostic work-up. Instead, all the tissue, including H&E sections, spare sections and tissue blocks, are couriered urgently to the regional haematological pathology team. This follows improved outcome guidance from the National Institute for Health and Care Excellence, published initially in 2003 and updated in 2016, for haematological malignancies.⁵ This guidance states that 'tissue samples from all patients with possible or definite diagnoses of haematological malignancy should be assessed by specialist haematopathologists'.⁵ It also follows more recent guidelines from the British Committee for Standards in Haematology published in 2011.²

The results illustrated in this study represent the first 17-month period of this service being offered in our department. As all cases were included, the numbers would include any learning curve. It is likely that the overall accuracy, in particular the sensitivity of the testing, would improve over time as we benefit from review and audit of our results.

In our hospital, patients undergoing core biopsy come from three sources:

- > haematology patients with a possible recurrence with a palpable cervical lymph node
- > patients presenting to the ear, nose and throat (ENT) department with a cervical mass with symptoms or signs suspicious of lymphoma
- > patients undergoing ultrasound of the neck for any reason who have suspicious radiological findings noted by our radiologists. These include rounded, irregular hypoechoic nodes with abnormal vascularity.

It is interesting to note that the nondiagnostic cases were frequently necrotic nodes that were calcified and it was hard to obtain adequate amount of tissue with the needle. The main differential for this would be granulomatous diseases, and this appears to hold true in the final diagnosis of these cases.

The turn-around for diagnosis is significantly shorter with core biopsy compared with excisional biopsies. This is particularly so in our department, as our radiology department is able to offer same day ultrasound and biopsy on the same day as our two-week wait head and neck clinic.

Undergoing an excisional lymph node biopsy is a surgical procedure often performed under general anaesthesia. This requires the patient to be admitted and results in the attendant costs surrounding an inpatient procedure. In our department, this would occur within 2 weeks, as per

cancer pathway guidelines, but this is significantly longer than the wait for a core biopsy.

In our hospital, the cost of this procedure performed as day surgery in an adult with no complications is £1,811 (HRG code CZ17U). Over the same 17-month period, the ENT department performed 53 excisional biopsies of cervical lymph nodes on patients in whom the diagnosis was inconclusive following FNAC and in whom there was a concern of a serious underlying diagnosis (e.g. lymphoma, squamous cell carcinoma, tuberculosis) from clinical or radiological findings. A conservative total for these investigations is £95,983. The true cost would likely be greater, as some of these patients would have comorbidities that would increase the cost. This compares to £130 for the cost of a core biopsy under ultrasound guidance. If the 53 biopsies had been cored instead of excised, this would have represented a cost of £6,890. Assuming a similar rate of successful diagnosis (90%) as obtained in our study, 53 cores plus 10% needing excisional biopsy as a repeat (five cases at £1,811, equalling £9,055) would represent a total cost of £15,945 and a potential saving of £80,038.

The authors recognise that this is a retrospective study with only limited numbers. A prospective study with larger numbers needs to be undertaken to confirm the results obtained.

Conclusions

This small study suggests that core sampling of cervical lymph nodes in patients with an undiagnosed mass may be helpful in reaching a diagnosis and therefore potentially reducing the number of patients being subjected to excisional biopsies under general anaesthesia. It also appears to be a valid first-line diagnostic tool for patients being investigated for lymphoma. The authors would therefore recommend that, in the context of appropriately setup haematopathological diagnostic pathway, that ultrasound-guided core biopsies may be used routinely in the investigation of the patient with a neck mass suspicious for lymphoma and in those with a cervical neck mass that has not been diagnosed by FNAC.

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