

FINE-NEEDLE ASPIRATION CYTOLOGY OF HEAD AND NECK LYMPH NODES IN A TEN-YEAR PERIOD – SINGLE CENTER EXPERIENCE

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SUMMARY – A wide spectrum of diseases including reactive processes, infections, lymphomas and metastatic tumors can cause enlargement of lymph nodes. The present study on 4062 patients with lymphadenopathy was conducted in the Department of Cytology, Sestre milosrdnice University Hospital Center, Zagreb, during a 10-year period. Of 4062 patients with lymphadenopathy, 1624 were males and 2438 were females, age range from several months to 85 years. Of 4062 fine needle aspiration procedures, 232/4062 (5.7%) samples were nondiagnostic. Lymph node aspirates were benign in 2640/3830 (69%) and malignant in 1190/3830 (31%) cases. Hematologic disease (Hodgkin lymphoma and non-Hodgkin lymphoma) was diagnosed in 482/1190 (40.5%) and metastases in 708/1190 (59.5%) cases. Of 482 patients with hematologic disease, 48/482 (10%) had Hodgkin lymphomas and 434/482 (90%) non-Hodgkin lymphomas. In the group of malignant lymphadenopathy, there were 212/708 (30%) metastatic squamous cell carcinomas, 177/708 (25%) metastatic adenocarcinomas, 149/708 (21%) metastases of other carcinomas, and 170/708 (24%) metastases of other malignant tumors. The present study confirmed the fine needle aspiration cytology of enlarged head and neck lymph nodes to be an excellent first-line method to investigate the nature of the lesions.

Key words: *Fine needle biopsy; Lymph nodes – cytology; Head – pathology; Neck – pathology*

Introduction

Lymph nodes are the most widely distributed and easily accessible component of lymphoid tissue. A wide spectrum of diseases including reactive processes, infections, lymphomas and metastatic tumors can cause enlargement of lymph nodes. The majority of enlarged lymph nodes represent benign reactive or inflammatory process. The fine needle aspiration (FNA) technique is a rapid, inexpensive, minimally invasive, reliable, and convenient procedure that is often used

in the initial evaluation of enlarged lymph nodes. The early use of FNA can direct further testing and evaluation, save time, expense and patient morbidity, and reduce patient anxiety¹. Dr. Khun reported using a needle to aspirate material for diagnosis of tumors as early as 1847. Greig *et al.* were the first to report this technique in 1904 to detect a trypanosomal organism from enlarged lymph nodes in patients with sleeping sickness. Then it was introduced in the United States by Martin *et al.* and was popularized in Scandinavia and Europe by Engzell *et al.*^{2,3}. Since the flourishing of the technique in the 1950s, the sphere of fine needle aspiration cytology (FNAC) has come a long way in conjunction with sophisticated ultrasound (US) and computerized tomography (CT) guided procedures to become an important diagnostic tool. Lymph nodes

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are among the most common aspirated organs for diagnostic purposes. The material obtained from the lesion is often found sufficient to make the diagnosis, and biopsies are usually done only in inconclusive cases or sometimes in the case of lymph node malignancies⁴.

Fine needle aspiration is used worldwide as a first-line method for the diagnosis of palpable neck masses, but ultrasound-guided FNA (US-FNA) can additionally be used to assess impalpable or less palpable lumps. However, in some cases, US-FNA of neck mass or lymph node involves a difficult approach. In particular, US-FNA for neck masses or lymph nodes that are located behind major vessels is difficult, even for experienced practitioners⁵.

Material and Methods

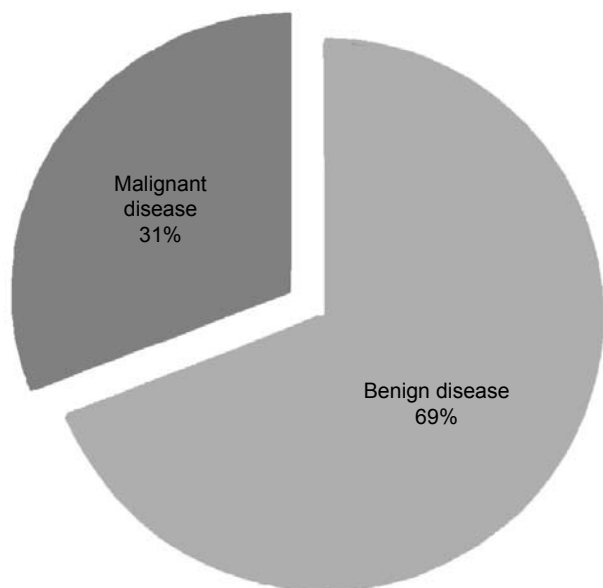
The present study on 4062 patients with lymphadenopathy was conducted in the Department of Cytology, Sestre milosrdnice University Hospital Center, Zagreb, Croatia, during a 10-year period, from January 1999 to December 2008. FNA of the enlarged lymph nodes was performed after obtaining a signed informed consent of the patient following thorough clinical examination. Palpable nodes were aspirated in the cytology department and deeply located ones were aspirated by a cytologist using US-FNA.

Ultrasound-guided fine needle aspiration procedure

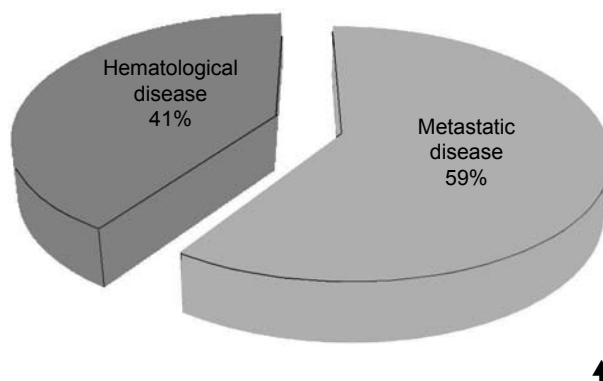
The patients were placed in the supine position and the exact position was decided according to the location of target node. After the patient's neck was sterilely prepped and draped, the target node was localized in the center of the US monitor using the US probe. With real-time monitoring on the US monitor, the needle tip could then be positioned within an appropriate area of the target. After the needle tip was placed in the appropriate position within the target, the sampling commenced using back-and-forth movements. No local anesthesia was used in US-FNA for any patient. No complication was recorded either during or after the US-FNA procedure^{5,6}. Following US-FNA, each sample was immediately smeared onto a glass slide. On each US-FNA, the practitioner could obtain 4 to 6 slides by duplicating the smears from one needle pass and one sampling. The slides were air dried, stained according to May-Grünwald-Giemsa procedure and then sent for cytologic analysis.

Results

Of 4062 patients with lymphadenopathy, 1624 were males and 2438 were females, with 1:1.5 male to female ratio. In this study, the age of patients ranged from several months to 85 years. Of 4062 FNA procedures, 232/4062 (5.7%) samples were nondiagnostic. Lymph node aspirates were benign in 2640/3830



← Fig. 1. Distribution of benign and malignant diagnoses in head and neck lymph node aspirates.



↑ Fig. 2. Hematologic versus metastatic disease in head and neck lymph nodes.

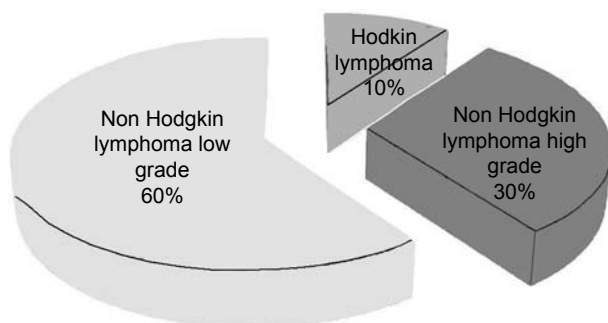


Fig. 3. Distribution of hematologic diseases in head and neck lymph nodes.

(69%) and malignant in 1190/3830 (31%) cases (Fig. 1). Hematologic disease (Hodgkin lymphoma and non-Hodgkin lymphoma) was diagnosed in 482/1190 (40.5%) and metastases in 708/1190 (59.5%) cases (Fig. 2). Out of 482 patients with hematologic disease, 48/482 (10%) had Hodgkin lymphomas and 434/482 (90%) non-Hodgkin lymphomas. Low grade non-Hodgkin lymphomas were diagnosed in 289/482 (60%) and high grade non-Hodgkin lymphomas in 145/482 (30%) patients (Fig. 3). In the group of malignant lymphadenopathy, there were 212/708 (30%) metastatic squamous cell carcinomas, 177/708 (25%) metastatic adenocarcinomas, 149/708 (21%) metastases of other carcinomas, and 170/708 (24%) metastases of other malignant tumors (Fig. 4).

Discussion

Lymphadenopathy is a commonly encountered clinical condition requiring prompt and accurate diagnosis, so that a proper treatment protocol can be started as early as possible. FNA is a completely safe, rapid and inexpensive method for the diagnosis of lymphadenopathy, reducing the need of surgical biopsy⁷. In the present study, we performed FNA on 4062 patients with lymphadenopathy during a period of 10 years. The duration of lymph node enlargement varied from 1 month to 12 years. More than half of the patients presented within six months of the onset of swelling. The pattern of lesions varied from non-neoplastic lesions such as reactive lymphadenopathy to neoplastic lesions such as metastatic lymphadenopathy and lymphomas. Of 4062 FNA procedures, 232/4062 (5.7%) samples were nondiagnostic, i.e. 232

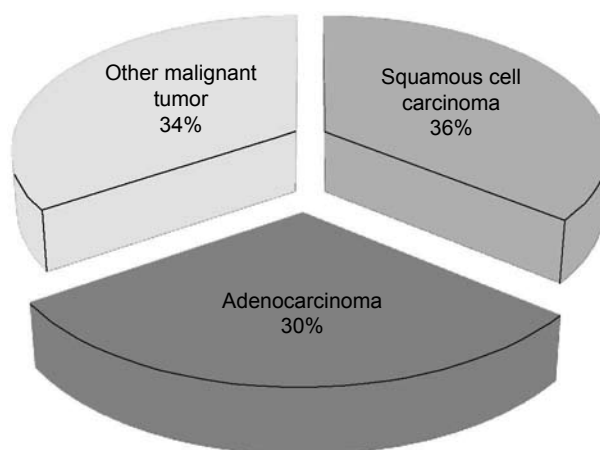


Fig. 4. Distribution of metastatic diseases in head and neck lymph nodes.

aspirates were excluded, as they were inadequate. The incidence of inadequate or unsatisfactory samples in various studies ranges from 0 to 25%⁷. Unsatisfactory aspirates were the result of poor handling of the aspirated material and lack of trained cytopathologists. Adequacy was also attributable to the small size or nature of the lesion, i.e. fibrosis, necrosis or cystic degeneration. The lesions arising in the lymph node can be found in patients of all age groups. In our study, the youngest patient was several months and the oldest 85 years old. Of 4062 patients with lymphadenopathy, 1624 were males and 2438 females, with 1:1.5 male to female ratio. Reactive lymphadenopathy was found to be the most frequent diagnosis with 2640/3830 (69%) cases. The criteria upon which the diagnosis of reactive lymphadenopathy was established were a combination of clinical and epidemiological data, patient age, symptoms, number and localization of lymph nodes, laboratory findings, peripheral blood smear, etc. Cytomorphological criteria included highly cellular smears, polymorphic patterns of cells without malignant features, and a considerable number of tingible bodies. It was also the most frequent diagnosis in other studies, where its incidence ranged from 18.9% to 86.4%⁸⁻¹¹. Patients with reactive lymphadenopathy were mostly referred to infectologist to be treated according to the cause of illness. Thorough history, radiologic investigations and immunocytochemistry in selected cases may help locate the primary site of metastatic tumor. Specific investigations such as a combination of lymphoscintigraphy and US-guided

FNAC of sentinel lymph nodes in the head and neck area have been found useful in picking up metastases in clinically undetectable lymph nodes. In our study, many cases of malignant involvement of lymph nodes were not clinically suspected. Hence, FNA plays a major role in diagnosing these cases¹².

Conclusion

The present study confirmed the FNAC of enlarged lymph nodes of the head and neck to be an excellent first-line method for investigating the nature of the lesions. FNA is a rapid, convenient and accurate method of tissue diagnosis that can be done on an outpatient basis. The procedure is safe and free from complications and is well tolerated by patients. There is no need of anesthesia and results are obtained quickly. It is an economical and convenient alternative to open biopsy of lymph nodes, the diagnostic accuracy of which can be further improved manifold when used in collaboration with other special techniques such as cytochemistry, bacteriologic culture, immunocytochemistry, ultrastructural studies and molecular hybridization.

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Sažetak

FNAC LIMFNIH ČVOROVA GLAVE I VRATA TIJEKOM 10-GODIŠNJEG RAZDOBLJA – ISKUSTVO JEDNE USTANOVE

A. Vasilj i S. Kojić Katović

Najčešći uzrok povećanja limfnih čvorova su reaktivni procesi, upale, limfomi ili metastatski tumori. U ovom radu analizirani su punktati 4062 bolesnika punktirani u Kliničkoj jedinici za citologiju KBC-a „Sestre milosrdnice“ u Zagrebu tijekom 10-godišnjeg razdoblja. Muških bolesnika bilo je 1624, a ženskih 2438. Raspon dobi bolesnika bio je od nekoliko mjeseci do 85 godina. Nedijagnostička su bila 232/4062 (5,7%) uzorka. U 2640/3830 (69%) punktata nađene su dobroćudne promjene, dok su u 1190/3830 (31%) punktata nađene zloćudne lezije. Hematološka bolest (Hodgkinov limfom i ne-Hodgkinov limfom) nađena je u 482/1190 (40,5%) punktata, a metastaze u 708/1190 (59,5%) punktata. Od 482 bolesnika s hematološkom bolešću 48/482 (10%) ih je imalo Hodgkinovu bolest, a 434/482 (90%) ne-Hodgkinov limfom. U skupini malignih limfadenopatija bilo je 212/708 (30%) metastaza karcinoma pločastih stanica, 177/708 (25%) metastatskih adenokarcinoma, 149/708 (21%) metastaza ostalih karcinoma i 170/708 (24%) metastaza ostalih malignih tumora. Ovaj rad potvrđuje da je citološka punkcija povećanih limfnih čvorova glave i vrata odlična metoda za ispitivanje naravi navedenih lezija.

Ključne riječi: *Biopsija tankom iglom; Limfni čvorovi – citologija; Glava – patologija; Vrat – patologija*