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THE SWAY OF THE FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSING CERVICAL LYMPHADENOPATHY WIDE-SPAN PATHOLOGIES

Pathology

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ABSTRACT

Background: Fine-needle aspiration cytology (FNAC) was proved to be a safe, reliable, rapid, and inexpensive diagnostic method in human pathology. It has a cardinal role in diagnosing different diseases involving lymph nodes including lymphoma, metastasis, recurrence and other reactive and inflammatory conditions. It is also very helpful in directing the patterns of further investigations and management in certain groups of patients based on the cytological diagnosis alone without resorting to surgical biopsies

Objectives: This study has been performed to further assess the reliability of FNAC diagnosis in lymph node diseases compared to histopathology and to determine whether FNA could replace tissue biopsies in certain cases; either in establishing diagnosis or in follow up and outlining further investigations and treatment plans. Expanding the use of FNA as replacement for tissue biopsies –whenever possible- would be very helpful and useful for physicians, patients and the medical institute –as a whole- as it is cheaper, less invasive and carries a lower risk of complications.
This study aimed to verify the sensitivity of FNAC in correlation with histopathology.

Methods: This retrospective analysis was carried out on patients presented with cervical lymphadenopathy and underwent fine needle aspiration from January 2002-January 2014 at King Hussein Medical Center. Patient's medical record reviewed, only patients who had a comparative excisional biopsy of same lesion were included. Definitive results of FNAC were compared with the excisional biopsy results in order to establish a comparison of the two techniques.

Results A total population of 194 patients were included in the final stage of the study. Fine-needle aspiration cytology was highly sensitive in diagnosing lymphomas 98.3%, less sensitive in cases of metastatic carcinoma and granulomas 85.4% and 81.2 % respectively. Fine-needle aspiration cytology was false negative in 29.8% of cases diagnosed as benign lymphadenopathy.

Conclusion: This study highlighted the usefulness of FNAC as a safe, reliable, rapid, and inexpensive investigation for lymphadenopathy. However, it was not a substitute for the conventional excisional biopsy but was complimentary to it.

KEYWORDS

Fine-needle aspiration cytology, excisional biopsy, FNA, lymphadenopathy.

Introduction

Patients presented with cervical lymph nodes enlargement can be herald of a diagnostic challenge against the backdrop of a wide variety of etiologies. Lymphadenopathy as a clinical presentation, that can arise either from benign or malignant causes depending on the environmental setup of the local/regional or systemic disease, serves as an excellent evidence of an underlying disease [1-3]. Cytological examination of the enlarged lymph nodes has become an integral tool for diagnosing several diseases due to early availability of results, simplicity of procedure, and minimal trauma with less complications. Whenever a sufficient diagnostic cellular material and experience are combined, they make cytological diagnosis of an equal significance as a histological biopsy [3-6].

In this study, a comparison between the fine needle aspiration cytology (FNAC) results of enlarged cervical lymph nodes and their excisional biopsy results was established ending up with recommendations regarding efficiency and reliability of cytopathology diagnosis compared to histopathology in patients presented with cervical lymphadenopathy.

Patients and Methods

This retrospective study was conducted by reviewing all medical records of patients referred with a cervical lymph nodes enlargement, that had underwent lymph node fine needle aspiration in Pathology department at Princess Iman Research and Laboratory Sciences Center, at King Hussein medical center (KHMC), or under ultrasound guidance at radiology department at KHMC, then samples were prepared to be examined by pathologist in the Pathology Department. Patient's reports were retrieved from the electronic hospital database during a 12-year period (2004 - 2015). Records were reassessed for selecting and only patients with cervical lymphadenopathy were included. Patients with no contemporaneous histopathology results were excluded. Demographic features; sex, age, histopathological grading were also documented.

Technical details

The FNAC procedure was performed under strict asepsis using a Franzen's aspiration handle using 23 gauge needles attached to a 20 ml syringe. Multiple attempt of aspiration were performed until adequate diagnostic sample was obtained. After the aspiration of lymph nodes by an experienced pathologist or a radiologist was done, a cyto-technician spread the material obtained on microscopic slides labelled by patient name, identification number and site of aspirate. Some of these slides are kept air dried and stained routinely by diff-quick stain (absolute methanol, eosin and methylene blue) and other slides were fixed immediately in 96% ethyl alcohol to be stained by Papanicolaou's stain. Special stains were performed whenever recommended by the pathologist including the Ziehl–Neelsen stain (ZN stain) for acid-fast bacilli (AFB) or any needed immunohistochemistry stains in suspected malignancies. In certain incidences, whenever lymphomas were suspected, a flow cytometry investigation was also performed using FNA procedure to obtain the sample. The diagnosis was classified according to various cytological features and morphological patterns as well as immunohistochemistry investigations, when conducted, and correlated clinically.

All patients diagnosed as positive cytologically, get through an

excisional biopsy for pathological diagnosis and confirmation or neck dissection for treatment. The surgical specimens were fixed in 10% buffered formalin, embedded in paraffin and 5-µm-thick sections were cut and stained routinely with hematoxylin and eosin.

Results

The final stage of this study included 194-patients who met the inclusion / exclusion criteria. There were no technical difficulties in the procedure nor procedure-related complications. There were 114 males (58.76 %) and 80 females (41.24 %) with male to female ratio of 1.4:1. Age of patient ranged between 4 months and 82 years old, with a median age of 32.25- years. The most common age group in this study was 20–50 years (65.46%) [Table1]. The size of the lymph nodes was <1 cm in 21 (14.94%) cases and ranged from 1 to 3 cm in 136 cases (70.10%) and >3 cm in remaining 37cases (19.07%). The cytological features observed overall were: lymphoma (30.93%), malignant metastatic carcinoma 24.74%, and necrotizing lymph adenitis (1.03%) [Figuer1]. Fine-needle aspiration cytology was highly sensitive in diagnosing lymphomas 98.3% [Figuer2], while less sensitive in cases of metastatic carcinoma and granulomas 85.4% and 81.2% respectively . However, fine-needle aspiration cytology was false negative in 29.8% of cases diagnosed as benign lymphadenopathy compared to excisional biopsy results [Figuer3].

Table 1: demographic features of study population

PARAMETER	NUMBER
Gender	
Female	80
male	114
AGE	
<20	14
20-50	127
>50	53
Lesion size	
<1 cm	21
1-3 cm	136
>3cm	37

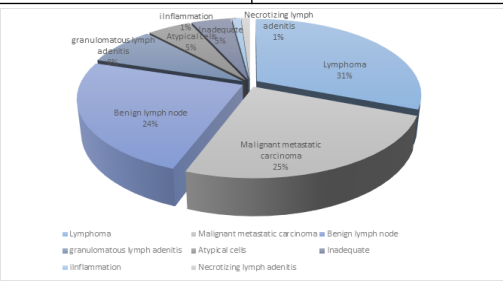

Figure1: The percentage distribution of various diagnosed lymph node lesions on fine needle aspiration cytology.

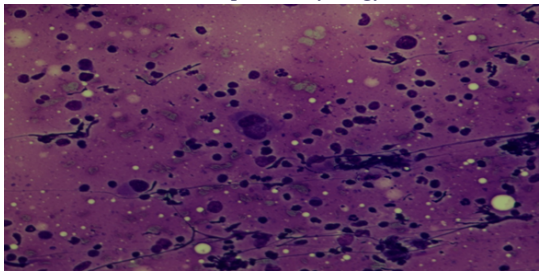

Figure2: Hodgkin lymphoma. Section showing a binuclear Reed–Sternberg cell, Diff. quick stain.

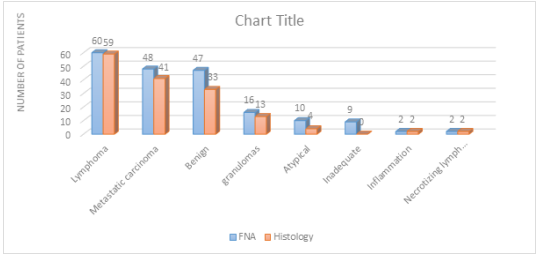

Figure 3: Comparison between FNAC and histology results.

Discussion

Cervical lymphadenopathy is one of the most common clinical findings in our daily practice, which might be localized or generalized and offers an important diagnostic clue to the etiology of underlying conditions [6,7]. Nevertheless it has many causes, including benign, infectious and malignant conditions. The cause of lymphadenopathy often cannot be determined on clinical basis alone and lymph node biopsy with consequential histopathological examination attends as the gold standard for diagnosis [8]. The evaluation of cervical lymphadenopathy is a common diagnostic challenge facing clinicians [9].

Fine-needle aspiration cytology (FNAC) is currently the primary diagnostic tool of choice for evaluating different lesions also been advocated as a useful method in comparison with more expensive surgical excision biopsies [7-9]. Nevertheless, in as many as 30% of cases, FNAC-based evaluations of solitary nodules have a limited ability to discriminate between benign and malignant lesions; and results in an indeterminate cytological diagnosis [2,3,6,7, 10-13].

Demographically, this review showed male predominance, male: female is 1.4:1. Lesions arising in lymph nodes can emerge in patients ranging from an early to advanced age [14]. In this study results revealed that age of patient ranged between 4 months and 82 years old, with a median age of 32.25-years, the most common age group in this study was 20–50 years (65.46%) [Table1]. In details: the peak incidence of benign lesions was in the 3rd decade while the peak incidence of malignant lesions was in the 5th decade. These findings were in accordance with previous works [2,12-14].

In the present study, the size of the lymph nodes was <1 cm in 21-cases (14.94%), and ranged from 1 to 3 cm in 136 cases (70.10%) and > 3 cm in remaining 37cases (19.07%). These figures came in close comparison to other workers [1,12,15].

In the current study, According to the histopathological diagnosis, the overall diagnostic sensitivity, and negative predictive value of FNAC of cervical lymph nodes were 98.3%, 70.23% respectively.

In the present study, 194- patients, underwent FNAC for cervical lymphadenopathy, results varied and found many pathologies as shown in (figure.1), our protocol of diagnosis mandate an excisional biopsy, once the FNAC is informative to confirm the diagnosis.

The comparative analysis of results, revealed high diagnosis utility of FNAC in diagnosing lymphoma, the diagnostic accuracy of 98.3% was achieved in this study. In malignant conditions of lymph nodes, FNAC exhibited a high sensitivity, the average being 85.4% [Figuer2]. The sensitivity of FNAC was less sensitive in cases of metastatic carcinoma and granulomas 85.4% and 81.2 % respectively. However, fine-needle aspiration cytology was false negative in 29.77% of cases diagnosed as benign lymphadenopathy compared to excisional biopsy results [Figuer3]. It was found that the sensitivity in our study was much higher than the sensitivity reported in other previous studies in terms of diagnosing lymphoma [15-23].

Conclusion:

To conclude, this study highlights the usefulness of FNA, which represents an efficient, minimally invasive, cost-effective relatively painless, rapid, repeatable, and reliable technique for the diagnosis of lymphadenopathy and may obviate the need for further biopsy. Hence, it must be remembered that there can be pitfalls when the diagnosis is made by cytopathology alone. However, it is not a substitute for conventional surgical pathology but is complimentary to it.

Conflict of interest statement: Authors state no potential conflict of interest.

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