EFFICACY OF FINE NEEDLE BIOPSY IN THE DIAGNOSIS OF TUBERCULOUS CERVICAL LYMPHADENITIS

Sunarto Reksoprawiro

ABSTRACT

The objective of this prospective study is to learn the value of fine needle biopsy (FNB) in the diagnosis of tuberculous cervical lymphadenitis. Twenty two patients with chronic cervical lymphadenitis were diagnosed by fine needle biopsy and open biopsy performed there after on the same node. The results of the cytologic and histopathologic diagnoses were analyzed. The histopathology is used as the final confirmation and considered as gold standard of the diagnosis. FNB cytology revealed a sensitivity 86.7%, specificity 71.4%, positive predictive value 86.7%, negative predictive value and accuracy of 71.4%, and 81.82%, consecutively. Chi-square analysis (a =0.05) showed that there was no significant difference between FNB cytology and histopathological examination (p= 0.003216). It can therefore be concluded that FNB is a reliable diagnostic tool in the management to avert the more invasive surgical procedures undertaken in the diagnosis of tuberculous lymphadenitis.

Keywords: *FNB, lymphadenitis, tuberculosis*

INTRODUCTION

Tuberculosis remains a major public health problem worlwide, especially in the developing countries like Indonesia. About thirty percent of the tuberculous infections are extrapulmonal (van Altena R and Richter C, 2002). Peripheral tuberculous lymphadenopathy is the most common manifestation of extrapulmonary tuberculosis, mostly affects the cervical lymphnodes (van Altena R and Richter C, 2002; Thompson MM et al., 1992; Bezabih M et al., 2002) A definitive and accurate diagnosis of tuberculosis is important because satisfactory results can be achieved with drug therapy, obviating surgery.

Open biopsy has been traditionally the standard for the diagnosis of tuberculous lymphadenitis. However, it can be associated with significant morbidity as well as delay in diagnosis. Over the last ten years, fine needle biopsy (FNB) has been established as the initial diagnostic test based on its low morbidity and high clinical yield. FNB avoids the physical and psychological trauma occasionally encountered after open biopsy. It is convenient for the patient and the physician as well, useful for outpatients, and relatively painless (Ponder TB et al., 2000). Fine needle biopsy has been found to be a safe tool, a quick and inexpensive method of diagnoses with reasonable accuracy of 84.4-89.77% (Suh KW et al., 1993; Dasgupta A et al, 1994; Singh JP et al., 1998). This presentation evaluated the diagnostic accuracy of FNB examination of patient suffering from cervical lymphadenopathy in our department.

Department of Surgery
Airlangga University School of Medicine
Dr Soetomo Teaching Hospital, Surabaya

MATERIAL AND METHOD

Patients include in this study were more than 15 years old with clinical diagnosis of chronic cervical lymphadenopathy, who came to Department of Surgery Dr.Soetomo Hospital Surabaya between February and April 2002. FNB and open biopsy of the suspected lymph node were performed to all patients. FNB was done by making a puncture into the enlarged lymph node using a 23G needle. Once the needle enters the mass, the needle was rapidly moved in and out, about 5 times to obtain sample of the node, before the needle was withdrawn. The needle was then attached to a syringe, and the material inside the needle was expelled on a glass slide. The material was gently smeared on the slide and fixed air-dried for Diff-Quick stain.

Afterwards, the same lymph node was excised surgically (open biopsy) for histopathologic examination. The specimens of FNB and open biopsy were sent to Department of Pathology Airlangga University School of Medicine, for cytology and histopathologic evaluation. The results of the cytologic and histopathologic diagnoses were analyzed, employing the histopathologic diagnosis as a gold standard. The sensitivity, specificity, positive and negative predictive value and accuracy of FNB were calculated.

RESULTS

Twenty two consecutive patients with clinical and histopathologic diagnoses of chronic cervical lymphadenopathy were found to be included in this study. There were 7 males and 15 females making the male to female ratio 1:2. The mean age was 22.54 years old and 68.18% of the cases were between 15-25 years (Table 1).

Table 1. Age and sex distribution

Age (year)	Sex		No.(%)
	Male	Female	
15-20	3	5	8 (36.4%)
21-25	2	5	7 (31.8%)
26-30	0	2	2 (9.1%)
31-35	0	1	1 (4.5%)
36-40	1	2	3 (13.6%)
41-45	1	0	1 (4.5%)
Total	7	15	22 (100%)

Chronic cervical lymphadenitis affected the upper neck, lower neck, upper and lower neck in 10 (45.5%), 5 (22.7%), and 7 (31.8%) cases consecutively.

Table 2. Age and site of of lymphnode distribution

Age (year)	Sites of lymph nodes			No.(%)
	Upper neck	Lower neck	Upper & lower neck	
15-20	4	0	4	8 (36.4%)
21-25	2	3	2	7 (31.8%)
26-30	1	0	1	2 (9.1%)
31-35	1	0	0	1 (4.5%)
36-40	1	2	0	3 (13.6%)
41-45	1	0	0	1 (4.5%)
Total	10	5	7	22 (100%)

Table 3. Correlation between FNB and histopathological examinations

FNB	Histopathologic diagnosis		Total
	Tuberculous lymphadenitis	Non-tuberculous lymphadenitis	
Tuberculous lymphadenitis	13	2	15
Non-tuberculous lymphadenitis	2	5	7
Total	15	7	22

Out of 22 cases, 15 (68.18%) cases of tuberculous lymphadenitis were confirmed by histophatologic examination. FNB cytology had a sensitivity of 86.7%, specificity 71.4%, positive predictive value 86.7%, negative predictive value 71.4%, and accuracy of 81.82%. Chi-square analysis (a =0.05) showed that there was no significant difference between FNB cytology and histopathological examination (p= 0.003216). The method of diagnosis of FNB is generally accepted to the patient, it simple, safe, quik, relatively inexpensive, and we did not find any complication of FNB in our cases.

DISCUSSION

The true gold standard for the diagnosis of tuberculous lymphadenitis has to be made by mycobacterial culture or staining. Lowenstein-Jensen methods is commonly used for the culture, and this needs 2-4 weeks time lapse to grow the mycobacterium. Direct microscopic examination with auramine or Ziehl-Neelsen staining will shows the acid fast bacilli if the number of microorganism in the sample is more than 104 /ml (van Altena R and Richter C, 2002). Lymphnode excicion and histopathological examination is still considered as the gold standard for diagnosis of tuberculous lymphadenitis in clinical practice.

FNB has been very useful in the diagnosis of tuberculous lymphadenitis as it was discussed in numerous publications (Dasgupta A et al., 1994; Masud KU et al., 1999; Gupta SK et al., 1993; Khan UF et al., 2001). Cytologic evaluation can be made instantly and diagnoses be reported within 15 minutes. Cytologic features of tuberculous lymphadenitis were categorized into four group: (1) epitheloid cell clusters with or without Langhans's giant cells, without necrosis, (2) epitheloid cell clusters with or without Langhans's giant cells, with necrosis, (3) occasional epitheloid cells without characteristic of necrosis nor giant cells, and (4) necrosis without epitheloid cell clusters nor Langhans's giant cells (Gupta AK et al., 1992; Lau SK et al., 1990)

Lau et al. (1990) reported that the sensitivity of FNB in detecting tuberculous lymphadenopathy was 77%. Singh et al (1998) found the accuracy of FNB in diagnosis of tuberculous lymphadenitis was 89.77%. Suh (1993) reported the sensitivity, specificity, and accuracy of FNB for tuberculous lymphadenitis as 77.2%, 99.0%, and 85.0% respectively. Masud (1999) found the sensitivity, specificity, positive predictive value, and negative predictive value of FNB for tuberculous lymphadenitis as 95.8%, 100%, 100%, and 98% respectively.

In this study, FNB cytology had a sensitivity of 86.7%, specificity 71.4%, positive predictive value 86.7%, negative predictive value 71.4%, and accuracy of 81.82%. There were 2 false positive and 2 false negative results. False positive result of FNB could be resulted from inadequate specimen of the excisional biopsy, or overdiagnosis of the cytologic examination. The polymerase chain reaction (PCR) test of the specimen from the 2 patients with false positive result of FNB showed tuberculosis. This means that histophatologic evaluation used as the gold standard to confirm the FNB diagnosis of tuberculosis lymphadenitis remains in questioned. False negative result of FNB could be caused by inappropriate puncture biopsy (inadequate sample), specimen mishandling, or cytological under-diagnoses. Fine-needle biopsy of enlarged lymph nodes is a rapid method of diagnoses, simple, safe, and an accurate procedure that often obviates the need for open surgical biopsy (van de Schoot L et al., 2001).

CONCLUSION

FNB cytology examination for cervical tuberculous lymphadenitis had a sensitivity of 86.7%, specificity 71.4%, positive predictive value 86.7%, negative predictive value 71.4%, and accuracy of 81.82%. There was no significant difference between FNB cytology and histopathologic examination (p= 0.003216). It can therefore be concluded that FNB can be proposed as a reliable diagnostic tool in helping to avert the more invasive surgical procedures undertaken in the diagnosis of tuberculous lymphadenitis.

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