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The Diagnostic Results of Cervical Lymph Node FNAB Compared to Conventional Biopsy in HIV/AIDS Patients with TB Lymphadenopathy in the Bamrasnaradura Institute

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Abstract

Background: **Cervical lymphadenopathy is a common clinical presentation in HIV/AIDS patients at Bamrasnaradura Institute. Conventional lymph node biopsy is the standard procedure for the diagnosis of this condition but the procedure incurs a high risk for healthcare providers.**

Objective: **To compare the diagnostic results of two procedures, Fine Needle Aspiration Biopsy (FNAB) and conventional cervical lymph node biopsy, in HIV/AIDS patients with cervical lymphadenopathy.**

Materials and Methods: **This study is a prospective comparison of an alternative procedure for the diagnosis of mycobacterial infection, Fine Needle Aspiration Biopsy (FNAB), with the conventional method. The study population comprises HIV/AIDS patients who attended the surgical clinic at Bamrasnaradura Institute.**

Results: **The most common pathology found in HIV/AIDS patients with cervical lymphadenopathy was TB lymphadenopathy, followed by fungus infection. AFB staining from FNAB, compared to the conventional biopsy, gave the same results. The cytological results from FNAB gave a low sensitivity (31.71%) and a high specificity (100%) when compared to the pathological study with the conventional biopsy (gold standard). The combination of AFB staining and cytological results increased the sensitivity of FNAB to 58.53%. The AFB stain from FNAB alone gave a sensitivity of 56.10%.**

Conclusion: **The results of the study recommend the use of FNAB at the Institute, because it is practical, convenient and less risky than the conventional method. Due to the high prevalence of mycobacterial infection in HIV/AIDS patients in the Institute, a positive result from FNAB can confidentially determine treatment for TB, but clinicians should be aware of the low sensitivity of FNAB when compared to conventional biopsy, and the possibility of "false negative" results.**

Key words: Lymphadenopathy, FNA, FNAB, HIV, AIDS

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AIDS is one of the most significant health problems in Thailand. Most patients have to deal with opportunistic infection such as mycobacterial infection and fungal infection. Sometimes, they also present with malignant diseases, such as lymphoma and sarcoma. One of the clinical presentations commonly found is fever with cervical lymphadenopathy. In order to make a diagnosis, the physician has to make a thorough investigation. One of the most useful diagnostic procedures for HIV/AIDS patients with cervical lymphadenopathy is lymph node biopsy. A previous study from the Bamrasnaradura Institute demonstrated that this could diagnose more than 80% of the cases, with the most common opportunistic pathogen being Mycobacterium tuberculosis (75.8%)[1,2].

On the other hand, the institute realizes that the diagnostic procedure can be harmful to healthcare providers, being prone to work-related transmission of HIV infection. It is also time-consuming and needs a lot of resources. Nowadays, Bamras-naradura Institute has more than 120 cases of HIV/AIDS patients who need lymph node biopsies[1]. In order to cope with these problems, we demonstrate another method to make the diagnosis in HIV/AIDS patients with cervical lymphadenopathy, ie. fine needle aspiration, which is safer and more convenient to perform[3-7]. In this report, we compared two diagnostic methods in terms of yield results from laboratories, cytology, and histopathology.

The aim of this study was to compare the diagnostic results of two procedures, Fine Needle Aspiration Biopsy (FNAB) and conventional cervical lymph node biopsy, in HIV/AIDS patients with cervical lymphadenopathy.

We hypothesized that the diagnostic results of two procedures, Fine Needle Aspiration Biopsy (FNAB) and conventional cervical lymph node biopsy, in HIV/AIDS patients with cervical lymphadenopathy were the same.

Methods

This is a prospective research, in which data were collected at Bamrasnaradura Institute from 1 May 2003 until 1 April 2004. We compared the diagnostic results of the two procedures, FNAB and conventional lymph node biopsy, in the same patients. Sixty patients were analysed.

Inclusion Criterion All HIV/AIDS patients with cervical lymphadenopathy who attended the surgical clinic for lymph node biopsy.

Exclusion Criteria: Patients who had contraindication for surgery or had lymph nodes smaller than one centimeter (FNAB will not give an appropriate result when performed in small lymph node)

Investigation Steps Sixty patients were enrolled for the research and all of them were subjected to both FNAB and conventional biopsy at the same time. The specimens from FNAB were investigated using cytological analysis and those from the conventional biopsies using histopathology. Both sets were investigated using culture/smear tests for mycobacteria (and other bacteria) and fungi. Cytological and histological specimens were reviewed by two different pathologists, in order to reduce bias.

Data Analyses All data were analyzed by descriptive statistics and chi-square comparison for laboratory results via SPSS.

Ethical considerations

All data were treated confidentially, under the supervision of the Bamrasnaradura Institute research committee. The ethical committee of the ministry of public health approved the research proposal.

All enrolled patients gave their informed consents regarding the procedure, its benefit, and all potential risks.

Results

Research results: Descriptive data part

All patients were adults, age ranging from 21 to 62 years. Lymph nodes sizes ranged from 1-5 centimeters (Table 1).

There were 43 (71.7%) males and 17 (28.3%) females in this study. Forty-six (76.7%) patients received antiretroviral therapy (Table 2).

Table 1 Distribution of patient age, and lymph node size

Demographic data	Mean ± SD
Age (years)	34.12 ± 8.28
Lymph node size (measured through skin, cm)	1.64 ± 0.79
Lymph node size (cm)	1.80 ± 0.94

Table 2 Distribution of patient sex, and anti-retrovirus drug status

Demographic data	N (%)
Sex	
Male	43 (71.7)
Female	17 (28.3)
Total	60 (100.0)
Anti-retroviral drug Status	
Yes	46 (76.7)
No	14 (23.3)
Total	60 (100.0)

Table 3 Laboratory results of FNAB

Lab.	Result	N (%) (n = 60)
AFB stain	Negative	37 (61.7)
	Positive	23 (38.3)
	Total	60 (100.0)
Wright stain	Negative	56 (93.3)
	Positive	4 (6.7)
	Total	60 (100.0)
Grams stain	Negative	60 (100.0)
	Total	60 (100.0)
Culture for TB	Negative	47 (78.3)
	Positive	12 (20.0)
	Positive for non-tuberculous mycobacterium	1 (1.7)
	Total	60 (100.0)
Cytology	Inadequate specimen	25 (41.7)
	Reactive hyperplasia	18 (30.0)
	Mycobacterium tuberculosis	13 (21.7)
	Cryptococcus	2 (3.3)
	Fungus (could not identify species)	1 (1.7)
	Squamous cell carcinoma	1 (1.7)
	Total	60 (100.0)

Results of FNAB and conventional biopsy

There were 25 (41.7%) inadequate specimens, 23 (38.3%) specimens were positive for AFB staining, and 4 (6.7%) specimens smeared positive for fungus from the FNAB. Of the positive AFB staining specimens, 12 (20%) cultured positive for Mycobacterium Tuberculosis. In the cytological study, 17 specimens showed positive diagnostic results and 18 (30%) specimens showed reactive hyperplasia (Table 3). There was one positive AFB staining with negative cytology.

All biopsy specimens were adequate for pathological diagnosis. Twenty-nine (48.3%) specimens were positive for AFB staining and 3 (5%) smeared positive for fungus from the conventional biopsy. Of the positive AFB staining specimens, 18 (30%) cultured positive for Mycobacterium Tuberculosis. In the pathological study, 54 (90%) specimens showed positive diagnostic results and 6 (10%) specimens showed reactive hyperplasia. The most common pathology was TB, with 41 (68.5%) specimens. The second most common pathology was fungus, with 4 (6.7%) specimens had positive tissue pathology and there were two positive Wright's stain specimens for fungus which had negative tissue pathology (Table 4). According to the data, there was one false positive AFB staining compared with tissue pathology as a gold standard.

Table 4 Laboratory results of conventional biopsy

Lab.	Result	N (%) (n = 60)
AFB stain	Negative	31 (51.7)
	Positive	29 (48.3)
	Total	60 (100.0)
Wright stain	Negative	57 (95.0)
	Positive	3 (5.0)
	Total	60 (100.0)
Grams stain	Negative	60 (100.0)
Culture for TB	Negative	40 (66.7)
	Positive	18 (30.0)
	Positive for non tuberculous mycobacterium	2 (3.3)
	Total	60 (100.0)
Tissue Pathology	Reactive hyperplasia	6 (10.0)
	Chronic inflammation	1 (1.7)
	Mycobacterium Tuberculosis	32 (53.4)
	Caseous granuloma	9 (15.1)
	Non tuberculous mycobacterium	2 (3.3)
	Cryptococcus	2 (3.3)
	Histoplasma	1 (1.7)
	Penicillosis	1 (1.7)
	Salivary gland	1 (1.7)
	Spindle cell tumor	1 (1.7)
	Malignant lymphoma	3 (5.0)
	Squamous cell carcinoma	1 (1.7)
	Total	60 (100.0)

Results of AFB staining from FNAB compared to conventional biopsy

Using tissue pathological diagnosis as the "Gold Standard", the AFB staining results collected from both procedure, FNAB and conventional lymph node biopsy, showed the same sensitivity and specificity in diagnosing HIV/AIDS patients with cervical lymphadenopathy (P-value >0.05, Tables 5 and 6).

Results of AFB staining and cytological study from FNAB compared to results of AFB staining and histological study from conventional biopsy

Cytological analysis from FNAB had 31.71% sensitivity and 100% specificity, when compared to histological results from the conventional biopsy (gold standard, Table 7). When AFB staining was combined with the cytological results from FNAB, the sensitivity increased to 58.53% and unchanged 100% specificity (Table 8).

Discussion

The most common pathology found in this study was TB lymphadenopathy, which is the same as previous study by Wongthawatchai at the Bamrasnaradura Institute[1,2]. Fungus is the second most common pathology in HIV/AIDS patients with cervical lymphadenopathy. AFB staining results from FNAB, compared to

Table 5 Comparative sensitivities of AFB staining specimens from FNAB and conventional biopsy

Disease positive from tissue pathology	Test positive	Test negative	Total	Chi-Squared	P-value
AFB staining from FNAB	23	18	41	1.77	0.091
AFB staining from biopsy	29	12	41		

Table 6 Comparative specificity of AFB staining specimens from FNAB and conventional biopsy

Disease negative from tissue pathology	Test positive	Test negative	Total	Chi-Squared P-value (Fisher Exact)
AFB staining from FNAB	0	19	19	0.378
AFB staining from Biopsy	1	18	19	

Table 7 Comparative sensitivities of cytology from FNAB and gold standard (tissue pathology from biopsy)

	Tissue pathology		Total	Sensitivity
	Disease positive	Disease negative		
Cytology from FNAB				
Positive Mycobacterium	13	0	13	31.71%
Negative Mycobacterium	28	19	47	Specificity
Total	**41**	**19**	**60**	**100%**

Table 8 Comparative sensitivities of AFB staining and cytology from FNAB and gold standard (tissue pathology from biopsy)

	Tissue pathology		Total	Sensitivity
	Disease positive	Disease negative		
AFB staining and Cytology from FNAB				
Positive Mycobacterium	24	0	23	58.53%
Negative Mycobacterium	18	19	37	Specificity
Total	**41**	**19**	**60**	**100%**

the conventional biopsy, gives the same results (P-value >0.05). The cytological results from FNAB give a low sensitivity (31.71 %) and a high specificity (100%) when compared to the pathological study with the conventional biopsy (gold standard). The combination of AFB staining and cytological results increases the sensitivity of FNAB to 58.53%. Considering that AFB stain alone, from FNAB, gave a sensitivity of 56.10%, we suggest that cytological analysis from FNAB may not be necessary for the diagnosis of TB in HIV/AIDS patients with cervical lymphadenopathy. The limitations of FNAB are the accuracy of the procedure, the skill of the surgeon, cell reservation methods and the pathology in the node itself. The final limitation is the competency of the pathologist who reviews the cytological results.

We still recommend that FNAB should be the first diagnostic procedure in surgical clinic for HIV/AIDS patient with cervical lymphadenopathy, because it is practical, convenient and safer than conventional biopsy. The positive results of AFB staining are reliable for the diagnosis of mycobacterial infection, due to high positive predictive value of the procedure. However, for negative results, a conventional biopsy should still be performed, in order to reduce false negative results.

Any future study should include more samples and more pathological results, giving a more comprehensive comparison of FNAB and conventional biopsy. The standardization of the FNAB procedure itself, such as the needle size, is another area that could be further studied.

Conclusions

Because it is practical, convenient and it gives a rapid result for initial diagnosis, we recommend FNAB for HIV/AIDS patients with cervical lymphadenopathy. The limitation of the method is its lower sensitivity than conventional biopsy. Because of the high prevalence of TB lymphadenopathy at Bamrasnaradura Institute, positive staining of TB from FNAB will give a high positive predictive value. This means that any positive results for TB will be truly positive. Conversely, FNAB has a low negative predictive value that will give a high frequency of false negative results.

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