

A retrospective study on role of fine needle aspiration cytology in diagnosis of cervical lymphadenopathy.

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Abstract

Background: Cervical lymphadenopathy is most commonly seen nowadays in clinical practice. The use of fine needle aspiration cytology (FNAC) in the investigation of lymphadenopathy has become an acceptable and widely practiced minimally invasive technique. It is highly cost-effective and accurate as a first-line investigative technique for many inflammatory conditions, granulomatous disorders, and malignancies.

Objective: To evaluate the diagnostic outcome and role of FNAC among patients presented with cervical lymphadenopathy of more than 3 weeks duration.

Materials and Methods: In this study, secondary data pertaining to FNAC during the 2-year study period were analyzed. FNAC was done on patients having cervical lymphadenopathy of more than 3 weeks. Classification of the patients was done according to the diagnosis by FNAC. Data entry and analysis were done using MS Excel. Data were presented in the form of percentages and appropriate figures.

Result: Of the 314 FNAC of cervical lymphadenopathy, 157 (50%) were nonspecific lymphadenitis, 113 (36%) were tuberculosis, 13 (4%) were metastatic, and 31 (10%) were abscess [Figure 1]. For 157 nonspecific lymphadenitis cases, further investigations such as sonography, CT scan, and excision biopsy were carried out at our institute. From this, ten were diagnosed with tuberculosis and five were metastatic.

Conclusion: FNAC is cost-effective, specific, minimally invasive, and a relatively painless technique. This study suggests that clinical findings supported by FNAC are an effective first-line investigation for diagnosis of cervical lymphadenopathy.

KEY WORDS: Cervical lymphadenopathy, fine needle aspiration cytology (FNAC)

Introduction

On many occasions patients present with unusual enlargement or altered consistency of lymph nodes, which is called lymphadenopathy. Lymphadenopathy is also a very good indicator of underlying disease if it is properly diagnosed. Cervical

lymphadenopathy is most commonly seen nowadays in clinical practice. In this technological era, to diagnose the cause of lymphadenopathy is still a challenging task for the medical professionals.^[1]

The first report on the use of needles for therapeutic purposes can be found in Arab medicine, in the writings of Albucasis or Abu al-Qasim, a court physician (936–1013 AD) in the medieval period. He described the therapeutic punctures of the thyroid gland for the first time using instruments resembling modern aspiration needles. Albucasis' description resembles a modern FNA of the thyroid gland. The earliest report of a needle technique to obtain material for microscopy was employed by Kun in 1847 who described a "new instrument for the diagnosis of tumors." There followed sporadic reports of this technique by clinicians including Leydon, who in 1883, used needle aspiration to obtain cells to isolate

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pneumonic microorganisms, and Greig and Gray in 1904 diagnosed trypanosomiasis in cervical lymph node aspirates from patients with sleeping sickness in Uganda.^[2] Hayes Martin, Edward Ellis, and Fred Stewart gave brief rebirth to this technique in the 1930s. In the early twentieth century, Martin and Ellis were considered to be the founder of modern needle aspiration techniques. True fine needles for aspiration of 22–24 gauge was developed in the Netherlands by Lopez-Cardozo and Soderstrom^[3] from Sweden in 1950.

The use of fine needle aspiration cytology (FNAC) in the investigation of lymphadenopathy has become an acceptable and widely practiced minimally invasive technique, which is safe, simple, rapid, and relatively pain free. FNAC is highly cost-effective and accurate as a first-line investigative technique with differential diagnosis including reactive hyperplasia/inflammatory conditions, granulomatous disorders, and malignancy, stratifying cases requiring further investigations, surgical intervention, or clinical follow-up.^[1]

This study was planned to evaluate diagnostic outcome and role of FNAC among patients presented with cervical lymphadenopathy of more than 3 weeks duration. Cervical lymphadenopathy can be presented as isolated or as a part of generalized lymphadenopathy.

Materials and Methods

This study was carried out in the department of ENT of GMERS Medical College, Valsad, Gujarat, India. This was a retrospective study, conducted from January 2012 to January 2014. Permission from the ethics committee was already obtained before starting the study. In this study, secondary data pertaining to FNAC were analyzed. FNAC was done on patients having cervical lymphadenopathy of more than 3 weeks. Classification of the patients was done according to the diagnosis by FNAC. Data entry and analysis were done using MS Excel. Data were presented in the form of percentages and appropriate figures.

Procedure for Fine Needle Aspiration Cytology^[4]

Materials Required

Needle (22–24 gauge), disposable syringe (3–20 mL), new glass slides, spirit swab, and suitable fixative.

Procedure

Palpate the target area, if it is a palpable mass. Then insert 22–24 gauge needle into the syringe. Fix the mass by palpating hand and insert the needle into the target area. Apply suction while moving needle back and forth within the lesions and change the direction of the needle. Terminate the aspiration when aspirated material or blood is visible at the hub or base of the needle. Release the suction before withdrawing the needle to equalize pressure within the syringe. After withdrawal of the needle, apply pressure for 2–3 min at the site of puncture to arrest bleeding and prevent hematoma formation. Aspirated material from the needle is expelled on to a clean glass slide by detaching the needle

and filling the syringe with air and expelling it with pressure. Smears are prepared in the same way as blood smears. If the material is semisolid, it is first crushed by gentle pressure with a glass slide and then the smears are prepared.

Fixatives and Stains

Dried smear are stained by Romanowsky staining method, especially May-Grunwald-Giemsa or its variations. Other stains can be applied according to the need of diagnosis, for example, Gram's stain, Ziehl-Neelsen stain, Periodic acid-Schiff stain, Alcian blue stain, and Papanicolaou stain. A total of 1.5% glutaraldehyde fixative solution is used for electron microscopic study, if required. Specialized techniques are applied on immunohistochemistry for cancer markers, if required.

Result

In this study, 314 cases were analyzed. From them, 182 (58%) were men and rest 132 (42%) were women. Most of the patients were of 42 years of age and Hindu by religion [Table 1]. During the study duration, 314 patients attended ENT Department with cervical lymphadenopathy of more than 3 weeks duration. They all had undergone FNAC for the diagnosis of etiology. Of the 314 FNAC of cervical lymphadenopathy, 157 (50%) were nonspecific lymphadenitis, 113 (36%) were tuberculosis (TB), 13 (4%) were metastatic, and 31 (10%) were abscess [Figure 1]. For 157 nonspecific lymphadenitis cases, further investigations such as sonography, CT scan, and excision biopsy were carried out at our institute. From this, ten were diagnosed with TB and five were metastatic.

Discussion

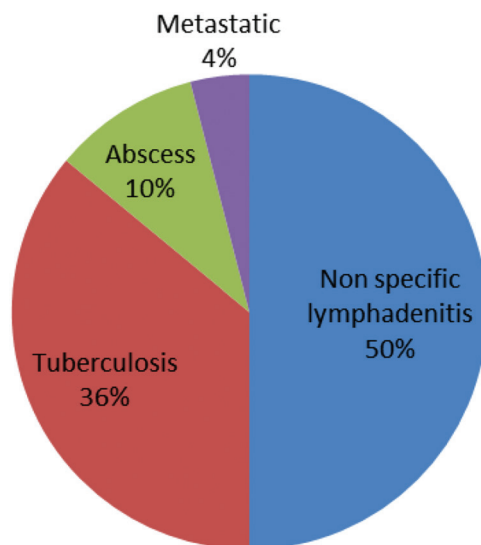
Various earlier studies mentioned diagnostic role of FNAC in lymphadenopathy.^[5] To diagnose various granulomatous disorders and to reach definitive diagnosis, the FNAC with other well-known supportive tests such as microbiological, immunohistochemical, radiological, biochemical, and special staining techniques were used.^[6]

In this study, 36% were diagnosed as having TB on FNAC. In a study by Bhuiyan *et al.*,^[7] 29.09% cases were of TB, which were little low as compared to this study. A suspicious clinical history of TB (pyrexia, night sweats, recent travel to endemic areas, and no previous BCG–bacillus calmette-guerin, vaccination) coupled with positive aspirate, blood, sputum, or urine tests for AFB– Acid Fast Bacillus, supports the diagnosis of TB. One disadvantage is the inherent delay in the culture result. With the development of new techniques, detection time for the organism will be shortened, which will improve the value of FNAC in clinical practice.^[8]

FNAC has been recommended as a first-line screening method in suspected malignancy in tumors.^[9] In this study, 4% cases were diagnosed as metastatic malignancy by FNAC. In another, 10.9% cases were found metastatic, which were higher than our findings.^[7]

Table 1: Demographic data

Demography of patients	No. of patients	Percentage (%)
Gender		
Male	182	57.96
Female	132	42.03
Age (years)		
20–29	70	22.29
30–39	79	25.15
40–49	84	26.75
50–59	81	25.79
Religion		
Hindu	218	69.43
Muslim	63	20.06
Christian	8	2.55
Others	25	7.96

**Figure 1:** Diagnosis of fine needle aspiration cytology (FNAC) of cervical lymphadenopathy.

The presence of granulomata in an aspirate may indicate the presence of a neoplastic process. Granulomata may be encountered in both Hodgkin's disease and non-Hodgkin's lymphoma, particularly T-cell lymphoma.^[9] Hodgkin's lymphoma is characterized by the classic Reed–Sternberg cells in a background of sarcoid-like granulomata, reactive lymphoid cells, and occasional eosinophils.^[10] Occasionally, lymph nodes containing metastatic carcinoma may also show features of granulomata. Earlier reports have been described in metastatic nasopharyngeal carcinoma, seminoma, and malignant melanoma.^[11] Histologically, noncaseating granulomata composed of epithelioid histiocytes with multinucleated giant cells were seen, but those can be indistinguishable from granulomatous inflammation from other causes. A series by Stanley^[12] highlighted the difficulties encountered in making a definitive diagnosis of the malignant neoplasm that mimics

or occurs in association with granulomata. In this study, 50% cases were of nonspecific lymphadenitis, which were quite matching with other study.^[7]

In this study, of the 314 cases, 157 were diagnosed by FNAC. Remaining 157 nonspecific lymphadenitis cases underwent various further investigations such as biopsy, sonography, and CT–Computed Tomography, scan according to the requirements, of which ten were diagnosed with TB and five were found metastatic. Remaining 142 were nonspecific lymphadenitis. So FNAC was a proven diagnostic measure in 157 + 142 = 299 (95.22%) cases of cervical lymphadenopathy. Other studies mentioned similar findings.^[7,8]

Although there is no single gold standard test, the important role of FNAC in histological diagnosis and its underutilization was highlighted by Steel et al.^[13] FNAC used in conjunction with clinical findings, radiological, and laboratory investigations can be a very cost-effective method.^[13]

Conclusion

FNAC is cost-effective, specific, minimally invasive, and a relatively painless technique. This study suggests that clinical findings supported by FNAC are an effective first-line investigation for the diagnosis of cervical lymphadenopathy.

References

1. Weisenburger DD, Nathwani BN, Winberg CD, Rappaport H. Multicentric angiofollicular lymph node hyperplasia: a clinicopathologic study of 16 cases. *Hum Pathol* 1985;16(2):162–72.
2. Webb AJ. Early microscopy: history of fine needle aspiration (FNA) with particular reference to goitres. *Cytopathology* 2001; 12(1):1–6.
3. Soderstrom N. Puncture of goiters for aspiration biopsy. *Acta Med Scand* 1952;144(3):237–44.
4. Choudhary R, Shukla S, Kumar N, Yadav DS, Mangal S. Fine needle aspiration cytology (FNAC) as a diagnostic technique in the study of effusions of thoracic and abdominal cavities in dogs and cats. *IJAPBC* 2013;2(2):328–37.

5. Ghoshal AG, Roy PP. Diagnosis of tuberculosis. *J Indian Med Assoc* 2000;98(3):115–8.
6. Bhattacharya S, Raghuvveer CV, Adhikari P. FNAC diagnosis of tuberculosis: an eight years study at Mangalore, *Indian J Med Sci* 1998;52(11):498–506.
7. Bhuiyan MAH, Fakir MAY, Hossain ABMT, Huq AHMZ, Gupta S. Role of fine needle aspiration cytology in the diagnosis of cervical lymphadenopathy. *Bangladesh J Otorhinolaryngol* 2008; 14(2):63–5.
8. Reyes CV, Thompson KS, Jensen JD, Choudhury AM. Metastasis of unknown origin: the role of fine needle aspiration cytology. *Diagn Cytopathol* 1998;18(5):319–22.
9. Fitzpatrick ML, LeJeune FE Jr. Mycobacterial cervical lymphadenitis: a review. *J La State Med Soc* 1996;148(11):451–4.
10. Friedman HH. Lymphadenopathy. In: *Problem-Oriented Medical Diagnosis*. Philadelphia, PA: Lippincott Williams & Wilkins.
11. Kim SS, Chung SM, Kim JN, Lee MA, Ha EH. Application of PCR from the fine needle aspirates for the diagnosis of cervical tuberculous lymphadenitis. *J Korean Med Sci* 1996;11(2):127–32.
12. Stanley MW. Cost benefit and outcomes analysis for fine-needle aspiration. Why do we know so little? *Clin Lab Med* 1999;19(4): 773–81.
13. Steel BL, Schwartz MR, Ramzy I. Fine needle aspiration biopsy in the diagnosis of lymphadenopathy in 1,103 patients. Role, limitations and analysis of diagnostic pitfalls. *Acta Cytol* 1995; 39(1):76–81.

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