



Diagnosis of Nodal Tuberculosis -by clinical and Histopathological correlation in pediatric age group (1-12 years)

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Abstract

Background: Cervical lymphadenopathy is a common clinical problem causing diagnostic dilemma. Various causes ranging from infections to autoimmune disorders are contributory. Hence it becomes essential to categorize them based on clinical and laboratory investigations to aid in diagnosis and management, of which FNAC remains a gold standard test. **Aims and Objectives:** To evaluate the accuracy of FNAC in determining the causes of cervical lymphadenopathy in children. **Materials and Methods:** A prospective study was conducted in children aged 1 -12 years with significant cervical lymphadenopathy for 2 years. Children were subjected to thorough clinical and investigatory assessment including complete hemogram, ESR, Mantoux, FNAC, chest x-ray and viral serology. **Results:** FNAC showed reactive hyperplasia due to underlying infections as the commonest etiology (74.66%) followed by granulomatous (13.33%), suppurative adenitis (6.66%) and others (5.35%). **Conclusion:** Conventional laboratory tests though have an ability in arriving diagnosis, FNAC is a simple, reliable and valuable diagnostic tool in the management of cervical lymphadenopathy in children. This reduces the need for costly procedures and provide timely utility in the treatment of lymphadenopathy.

Keywords: Cervical lymphadenopathy, children, tuberculosis, FNAC

Introduction

Lymphnode diseases are always complex, because focus of large number of diseases reaches via lymph only. Because of inherent complexity of immune system, lymph node enlargement is related to abnormalities in the organ associated with the disease. Neck nodes constitute 1/3rd of the total nodes of the body. They form the major composition in lymphatic system which are clustered in small groups, some in chains at

specific location draining respective anatomic regions. Analysis of lymph node enlargement is not an easy task. Improper diagnosis and treatment may convert a potentially curable disease into an incurable one. This study intends to find out systematically the various pathological conditions presenting with enlarged lymphnodes in the neck and various mode of presentation. A study of the role of FNAC in diagnosing these

conditions after clinical and laboratory investigations had been undertaken within the study. Various trends observed in this study are correlated with recent literature and conclusions are made.

Materials and Methods

The study was carried out in the Department of Paediatrics, RMMCH, Chidambaram from October 2014 – September 2016 in children between age group 1 – 12 years with significant cervical lymphadenopathy (node size more than 1 cm) was taken. Information taken including age, sex, duration, associated symptoms like fever, cough, weight loss, loss of appetite, ear discharge and also information taken regarding site, size,

consistency, mobility and significant findings in systemic examination were recorded. Final diagnosis was made after complete hemogram, erythrocyte sedimentation rate (ESR), chest xray, Mantoux, Gram stain, fine needle aspiration cytology (FNAC), biopsy and serology accordingly.

Results

Total of 75 cases were studied from October 2014 to September 2016. Out of these 75 patients, 45 were from out patients (65%) and rest of 30 cases (35%) were from inpatients. Majority of them are in age group 4 – 8 years (47%) followed by 1- 4 years (27%) and then 8- 12 years (26%).

Table 1: Age distribution

Age	No of cases	Percentage %
1yr-4yr	20	26.67%
4yrs-8yrs	35	46.67%
8yrs-12yrs	20	26.66%
Total	75	

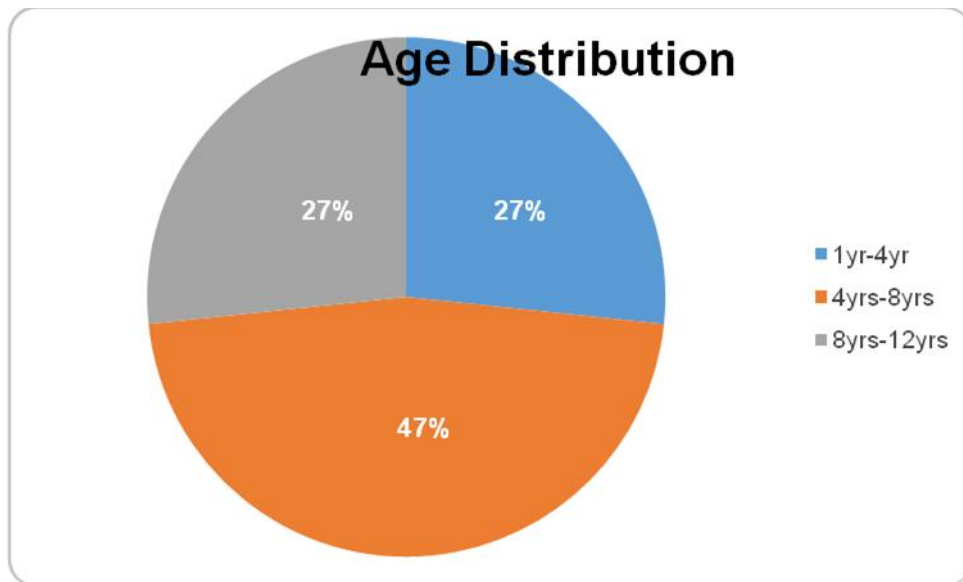


Figure 1. Age distribution of Patients

Incidence seemed to be common in males (53.33%) than in females (46.67%).

Of all the symptoms, neck swelling (80%) was the main symptom in all cases. Associated symptoms like fever and cough were 75% and 72% respectively.

Table 2: Distribution of symptoms

Symptoms	No. of cases	Percentage (%)
Swelling Neck	60	80%
Pain	15	20%
Fever	60	80%
Cough	54	72%
Weight Loss	24	32%
Loss of Appetite	20	26.60%
HSM	6	8%
Sore Throat	8	10.60%
Ear discharge	8	11%
Oro Dental Pain	4	5.30%
>1 Symptoms	18	24%

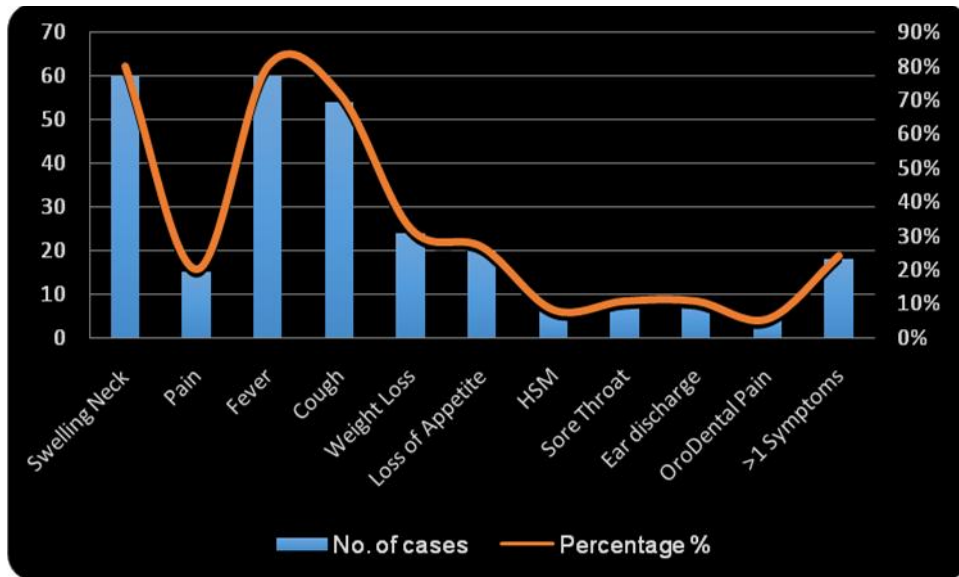


Figure 2. Distribution of symptoms in all the cases

Table 3: Comparison of nodes involved

Sites	No of cases	Percentage %
Post-Cervical	09	12%
Sub-Mandibular	25	33.33%
Anterior Cervical	31	41.33%
Supra-Clavicular	0	0%
Occipital	5	6.67%
Post-Auricular	5	6.67%

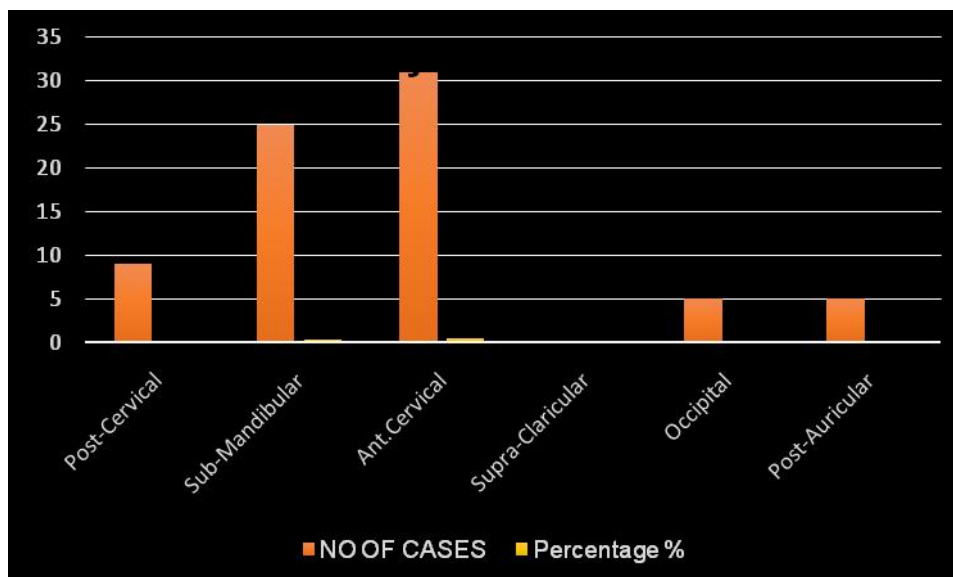


Figure 3: Comparison of Various Groups of Cervical Lymphnodes

Among nodal involvement, anterior cervical nodes (41.3%) followed by submandibular nodes (35.33%), posterior cervical nodes (12%) and occipital nodes (6.66%) were noted.

In 53.33% of cases, node size was below 2 cm, 46.67% cases had node of 2 – 4 cm and nil cases were more than 4 cm.

In 78.67% cases, nodes were discrete and mobile, and matted in 21.33% cases. Hepatosplenomegaly was seen in 8% cases. Blood counts were done in all cases, where 37.33% showed leukocytosis, 21.33% had leucopenia, 24% had lymphocytosis and 17.33% had anemia

Table 4: Comparison of histopathological findings

Cytology	No of cases	Percentage %
Caseating Granulomatous lymphadenitis	3	4.00%
Granulomatous lymphadenitis	7	9.33%
Suppurative lymphadenitis	5	6.67%
Reactive Hyperplasia	56	74.67%
Lymphoma	1	1.33%
Inadequate Sample	3	4.00%

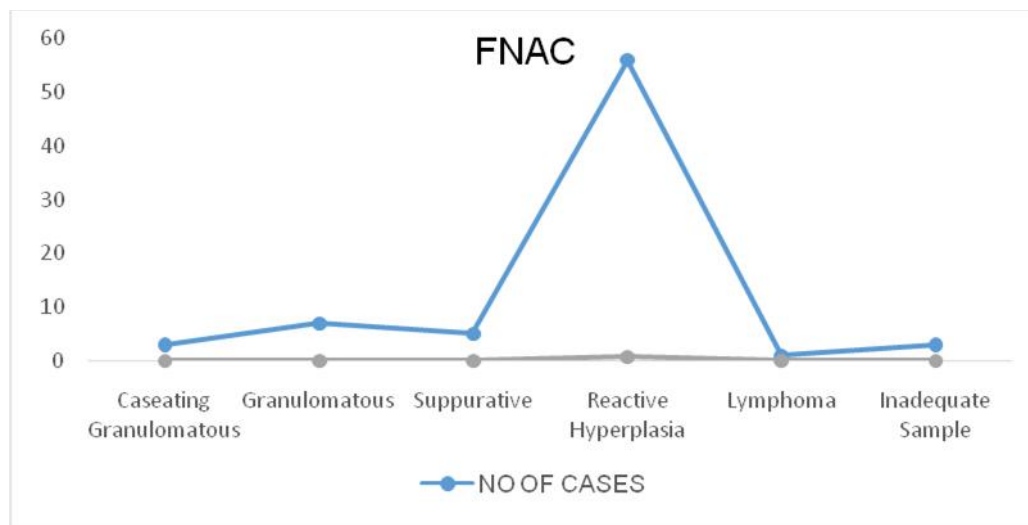


Figure 4: Comparison of FNAC findings

FNAC was done in 60 cases. Final diagnosis was made after clinical correlation, FNAC report, Mantoux test, contact history and relevant investigations. 74.66% cases were diagnosed as

reactive lymphadenitis, 13.33% cases had granulomatous adenitis correlating tuberculosis and 6.66% cases had suppurative adenitis.

Table 5: Correlation of Clinical and Pathological Diagnosis

Clinical diagnosis	No of cases	FNAC Diagnosis	Correlated	
			Yes	No
Infections	50	Reactive Hyperplasia	50	-
Tuberculosis	18	Granulomatous Lymphadenitis	10	8
Non-Hodgkin's Lymphoma	2	Non-Hodgkin's Lymphoma	1	1
Others	5	Reactive Hyperplasia	5	-

Table 6: Correlation of Clinical and Laboratory Diagnosis

Clinical diagnosis	No of cases	Lab investigations	Correlated	
			Yes	No
Infections	50	RAISED TC, DC, ESR	50	-
Tuberculosis	18	MANTOUX, CXR	10	8
Scrub Typhus	2	IgM	2	-
Kawasaki Disease	2	FNAC	2	-
Non-Hodgkin's Lymphoma	2	FNAC & BIOPSY	1	1
Chronic Granulomatous disease	1	FNAC & BIOPSY	1	-

Table 7: Correlation of Granulomatous and Non Granulomatous Lymphadenitis with Clinical and Lab Findings

Pathological Finding	Total Cases	Contact History	CXR	Mantoux	ESR	Raised TC/DC	USG	Excision Biopsy
Granulomatous Adenitis	18	07	10	10	03	10	06	03
Non Granulomatous adenitis (Reactive)	55	06	08	08	24	28	08	06
Lymphoma	02	Nil	1	0	1	1	1	1

Positive correlation for TB with:

FNAC alone – 41%

FNAC + Mantoux – 55.55%

FNAC + Mantoux + clinical findings – 64.42%

Positive correlation for Reactive adenitis:

FNAC alone – 100%

Discussion

In this study, FNAC remains basic tool for evaluating children with cervical lymphadenopathy and serves to arrive at a definitive diagnosis. But sensitivity of detecting granulomatous and non granulomatous lesions although similar, but specificity in detecting TB is based mainly on correlation with clinical and lab investigations. In this study major cytological picture was reactive hyperplasia (74.66%) followed by granulomatous adenitis (13.33%), suppurative adenitis (6.66%), lymphoma (1.33%) and inadequate aspirate of 3 cases.

Mishra SD et al observed reactive hyperplasia of 71.8%, granulomatous adenitis (17.5%), suppurative adenitis (6.6%) and malignancy in 3.6% in his study of 18 cases. Knight PJ et al in their study of 175 cases found reactive hyperplasia in 57.5%, granulomatous adenitis (28.2%) and malignancy in 17.9%. Various studies have registered the sensitivity of FNAC in diagnosing TB as 16.5%, 77%, 80.7%, 84.4%, and 95%.

Due to ongoing antigenic stimulus, the lymphnode growth may exceed the normal limits.

Knight PJ et al emphasized relating age to lymphadenopathy, that age is not important in predicting the incidence of significant lymphadenopathy.

In this study, male incidence was 53.33% and female incidence was 46.67%. Moore et al found male preponderance with male to female ratio of 3: 1. Sheikh MP et al observed higher incidence in males as compared to females.

In this study majority of symptoms were neck swelling (80%), followed by fever (75%) and cough (72%). Sheikh et al observed history of neck swelling in 100% of cases and fever in 86.5% of cases. In the present study, upper anterior cervical group was commonly involved (41.33%) followed by posterior cervical nodes (35.33%). Knight PJ et al observed in their study of 239 children, 47% of them had involvement of upper anterior cervical group of nodes.

In this study systemic examination revealed hepatosplenomegaly in 8% of cases. Barton LL et al observed 7% of hepatosplenomegaly, out of 74 cases with cervical lymphadenopathy.

In this study, variant presentation of cervical lymphadenopathy was noted in 2 cases of Scrub typhus and 2 cases of Kawasaki disease. Lymphoproliferative disorder was also diagnosed in one of the cases.

Out of 18 cases of suspected tubercular lymphadenopathy, contact history was positive in

7 cases, Mantoux was positive in 10 cases, chest X-ray showed positive findings in 10 cases, ESR was raised in 8 cases, lymphocytic leukocytosis was observed in 10 cases and ultrasound showed caseation in 6 cases. FNAC showed granulomatous lymphadenitis in 7 cases, caseating adenitis in 3 cases and 3 of cases were confirmed with lymphnode excision biopsy.

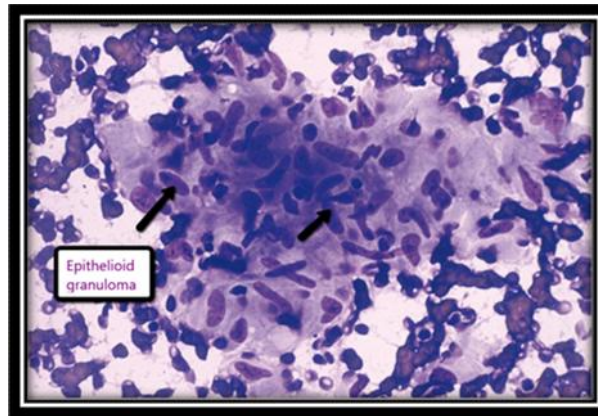


Fig 5: FNAC - Granulomatous Lymphadenitis (Giemsa, 40 X)

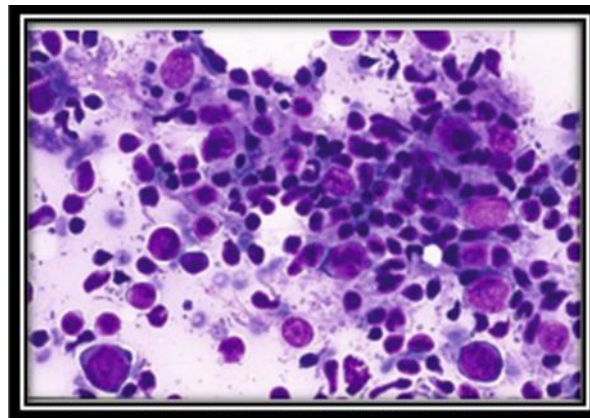


Fig 6: FNAC – Reactive Lymphadenitis (H & E, 40 X)

Out of 55 cases of suspected infectious etiology, 6 cases had positive contact history, 8 cases showed positive chest X-ray findings, 3 cases had positive Mantoux test, 28 cases of raised ESR, 28 cases with neutrophilic leukocytosis and 8 cases with positive ultrasound findings. FNAC showed reactive hyperplasia in all the 55 cases and 6 of cases were confirmed with lymphnode excision biopsy.

In this study of 75 cases, FNAC alone had 41% of diagnostic accuracy and when combined with Mantoux test, accuracy increased to 55.5% and when further combined with clinical findings and Mantoux, the overall diagnostic accuracy increased to 64.42%. However, FNAC showed 100% accuracy in the context of infectious etiology.

Conclusion

A detailed clinical examination and history is the initial approach to these children presenting with cervical lymphadenopathy. Occurrence of cervical lymphadenopathy is a common problem in children. Major etiology is infection in draining areas like throat, ear, scalp which needs to be recorded in clinical examination. Treatment of appropriate antibiotics is sufficient for these cases. But for the children presenting with serious systemic illness like Tuberculosis, HIV or Brucellosis, there is a need for detail evaluation with investigations like Chest X ray, Mantoux test, FNAC and serology.

Although FNAC is a simple diagnostic tool with minimum complications when compared to other tests, its specificity remains high when it is correlated with other investigations in detecting granulomatous lesions especially tuberculosis.

References

1. Nield LS, Kamat D. Lymphadenopathy in Children: When and How to Evaluate. *ClinPediater*. 2004; 43: 25-33.
2. Darville T, Jacobs RF. Lymphadenopathy, lymphadenitis, and lymphangitis. In: Jenson HB, Baltimore RS, (eds). *Pediatric Infectious Diseases: Principles and Practice*. Philadelphia: WB Saunders; 2002: 610–629.
3. Niedzielska G, Kotowski M, Niedzielski A, Dybiec E, Wiczorek P. CLA in children—Incidence and diagnostic management. *Int J PediatrOtorhi*. 2007, 71; 51-56.
4. Srouji IA, Okpala N, Nilssen E, Birch S, Monnery P. Diagnostic cervical lymphadenectomy in children: a case for multidisciplinary assessment and formal management guidelines, *Int J PediatrOtorhi*. 2004; 68 (5): 551-556.
5. Ioachim HL, Ratech H. Ioachim's Lymph node Pathology, 3rd ed. Philadelphia: Lippincott Williams &Wilkins, 2002.
6. Citak EC, Koku N, Demirci M, Tanyeri B, Deniz H. A retrospective chart review of evaluation of cervical lymphadenopathies in children. *AurisNasus Larynx*. 2011; 38: 618-21.
7. Ayugi J, Ogengo J, Macharia I, Olabu B. Pattern of acquired neck masses in a Kenyanpaediatric population. *Int. J.OralMaxillofac. Surg*. 2011; 40: 384–387.
8. Papadopouli E, Michailidi E, Papadopoulou E, Paspalaki P. Cervical lymphadenopathy in childhood epidemiology and management. *Pediatr Hematol Oncol*. 2009;26(6):454-60
9. Jackson MA, Chesney PJ; Lymphatic system and generalized lymphadenopathy. In Long SS, Pickering LK, Prober CG editors; *Principles and Practice of Pediatric Infectious Diseases*. 4th edition, Elsevier Saunders, Edinburg, 2012: 127.
10. Yaris N, Cakir M, Sözen E, Cobanoglu U; Analysis of children with peripheral lymphadenopathy. *ClinPediater (Phila)*., 2006; 45(6): 544-549.
11. Handa U., Mohan H. et al Role of FNAC in evaluation of Paediatric Lymphadenopathy. *Cytopathology*, 2003; 14:66-69
12. Mishra S.D., Garg B.K. et al Cervical lymphadenopathy in children: A study of 137 cases. *Indian paediatrics*, 1972;9(12):812-815.
13. Leon van de School, Aronson D.C. et al. The role of in children with persistent and suspicious lymphadenopathy. *Journal of Paediatric surgery*, 2001; 36(1):7-11
14. Knight P.J., Mulne A.F. et al when is lymphnode biopsy indicated in children with enlarged peripheral nodes? *Paediatrics*,1982;69(4):391-396
15. Narang R.K., Pradhan S. et al Place of FNAC in diagnosis of lymphadenopathy. *Indian J. Tub* 1990;37:29-31
16. Singh A., Singh M. et al, Role of FNAC in diagnosis of lymphadenopathy. *Indian Journal of Surgery*, 1986; 133-137
17. Mondal, Mukherjee D. et al FNAB cytology in diagnosis of cervical lymphadenopathies. *Indian Med.Association*, 1989; 87(12) P:281-283.
18. Ragesh K.P., Chana R.S., et al, Head and Neck masses in children: A clinicopathological study. *Indian jour. Of Otolaryngology*, 2002;54(4):268-271
19. Papadepouli E, Michailidi E, Papadopoulou E, Paspalki P, Vlahakis I, Kalmanti M. Cervical lymphadenopathy in childhood

- epidemiology and management. *Pediatr HematolOncol.* 2009; 26(6):454–460.
20. Bazemore AW, Smucker DR. Lymphadenopathy and malignancy. *Am Fam Physician.*2002; 66:2103–2110.
21. Reddy MP, Moorchung N, Chaudhary A. Clinico-pathological profile of pediatric lymphadenopathy. *Ind J Pediatrics.* 2002;69(12):1047–1051. doi: 10.1007/ BF02724385.
22. Khan RA, Wahab S, Chana RS, Naseem S, Siddique S. Children with significant cervical lymphadenopathy: clinicopathological analysis and role of fine-needle aspiration in Indian setup. *J Pediatr.* 2008;84(5):449–454. doi: 10.2223/ JPED.1840.
23. Shakya G, Malla S, Shakya KN, Shrestha R. A Study of FNAC of cervical lymph nodes. *J Nepal Health Res Counc.* 2009;7(14):1–5.
24. Bhatt JV, Shah JM, Shah F (2002) Clinico-pathological profile of cervical lymphadenopathy: a prospective study. *J Appl Basic Med Sci* 2(2):35–39. June 5 2010
25. Shaikh SM, Balochi I, Bhatti Y, Shah AA, Shaikh GS, Deenari RA. An audit of 200 cases of cervical lymphadenopathy. *Med Channel.* 2010;16(1):85–87.
26. Naeimi N, Sharifa A, Erfanian Y, Velayati A, Izadian S. Differential diagnosis of cervical malignant lymphadenopathy among Iranian patients. *Saudi Med J.* 2009; 30(3):377–381.
27. Mansoor I, Sayed AA. Cervical lymph node biopsy: clinical and histological significance. *Saudi Med J.* 2002;23(10):1291–1292.

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