

Study of Cytomorphological Patterns in Cervical Lymphadenopathies—A Hospital Based Cross Sectional Study

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Abstract

Background: Cervical Lymphadenopathy is common clinical presentation to inflammatory process to symptomatic or asymptomatic clinical conditions. The cause varies from mild infections to chronic diseases to Malignancies. Hence Cervical Lymphadenopathy needs to be investigated to find out the cause.

Aim & Objective: To assess the various causes of Cervical Lymphadenopathy and to identify the most common cause of Lymphadenopathy with distribution of lesions in different age groups, gender and levels of cervical lymph nodes.

Material and Methods: This study was conducted by over a period of 12 months. Total 380 Patients reported in Cytology section of Pathology Department with Cervical Lymphadenopathy. The stained smear was then studied for cytological features and to arrive in a Diagnosis.

Results: Maximum number of cervical Lymphadenopathy patients were seen in second and third decade of life, Male to female ratio was 1.2: 1. Most common were Cases of Reactive Lymphadenitis with (N-163/380; 42.8%) overall, with most cases in first decade (0-10, N-62/163;38%) Followed by Tubercular /Chronic Granulomatous lesion (N-146/380; 38.4%) followed by Acute Suppurative Lymphadenitis with 41 cases. Least common was Malignant lesion (30/380; 7.9%), with increasing cases after 4th decade.

Conclusion: FNAC is a Safe, Simple, Inexpensive alternative option to Diagnose Cervical Lymphadenopathy Cases. FNAC helps to classify the patients in reactive lymphadenitis, or to classify in infectious category or malignant diseases and refer the patients to further specialist. FNAC has great economical and psychological advantage to the patients.

Keywords: FNAC, Reactive lymphadenitis, Tuberculous lymphadenitis, Metastatic squamous cell carcinoma, Upper internal jugular nodes.

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Introduction

Lymphadenopathy is enlargement of Lymphnodes caused by activation of lymphoid series cells. Peripheral Lymphadenopathy is response to symptomatic or asymptomatic Inflammation. Cervical Group

Lymphadenopathy is a common clinical manifestation presented by patients in Out Patient Department. It is most commonly caused by infective etiology (esp. Bacterial, Viral), Non-specific conditions causing Reactive Lymphadenitis &

Lymphoproliferative lesions and malignant causes. Most common investigation for Lymphadenopathy is FNAC, which is proven to be useful and an inexpensive alternative minimally invasive technique with good success and accuracy rate in diagnosis which help in treatment plans for the patients. Exclusion of lymphoid Neoplasms and metastasis is of great importance in patients since it obviates the need of surgical excision. The Main objective of the study was to study common Cytomorphological Patterns in Cervical Lymphadenopathies with common age Group involved, Different Cytological diagnosis in Cervical Lymphadenopathies in Male & Female Gender and Levels of Cervical Lymph nodes involved in Cervical Lymphadenopathies with most common Cervical Lymph node Level Involved in Lymphadenopathy.

Material and Methods

Study Design: Cross Sectional

This study was conducted by Department of Pathology over a Period of 12 months. Sample Size-Total 380 Patients reported in Cytology section of Pathology Department with Cervical Lymphadenopathy. After taking Informed consent and documenting

age, sex, site of FNAC, FNAC was performed under strict aseptic precautions using 10 ml syringe with 22-23 G needle. Two to three smears were Prepared and immediately fixed in methanol, were stained in Rapid Papanicolou Stain (Biolab Diagnostics). The stained smears were then studied for cytological features and to arrive in a diagnosis.

Inclusion: All patients with cervical Group of lymph node enlargement were included in study.

Exclusion: Excluded were patients with salivary gland lesions, Lipomas and those with inconclusive cytological diagnosis.

Ethical Approval: Institutional ethics committee approval was taken before the study.

Results

The age of the patients in the study were diverse with as young as 6 months to 80 years of age. Most common age groups involved is 11-20 & 21-30 (N-93, 49% of the total) with least number of patients in >70 years of age (N-08, 2.1%). Out of 380 patients, 210 were males and 170 were females. Male to Female ratio was 1.2:1. (Table: 1 & Figure: 1)

Table 1: Age Groups with Gender Distribution of the Cases

| Age wise Distribution | Male | Female | Total | Percentage |
|-----------------------|------|--------|-------|------------|
| 0-10 | 64 | 19 | 83 | 21.8 |
| 11-20 | 45 | 48 | 93 | 24.4 |
| 21-30 | 40 | 52 | 92 | 24.2 |
| 31-40 | 16 | 29 | 45 | 11.8 |
| 41-50 | 17 | 09 | 26 | 6.8 |
| 51-60 | 11 | 09 | 20 | 5.2 |
| 61-70 | 12 | 01 | 13 | 3.4 |
| >70 | 05 | 03 | 08 | 2.1 |
| Total | 210 | 170 | 380 | 100 |

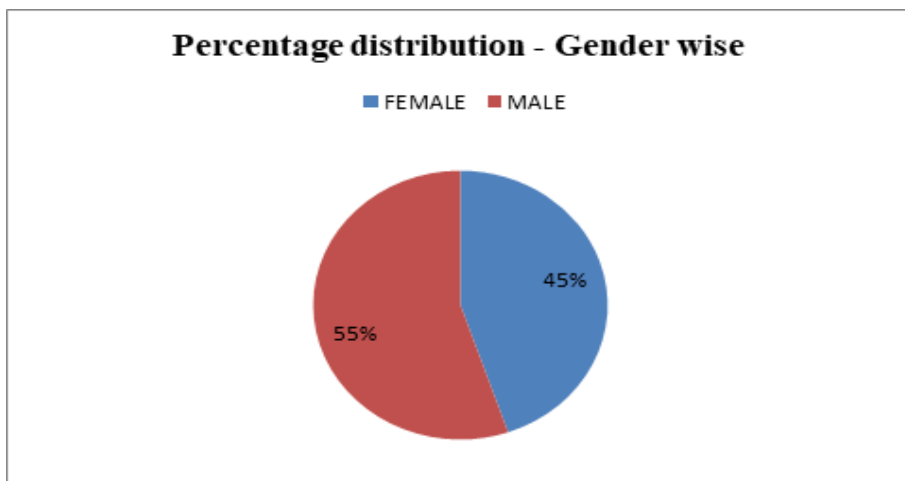


Figure 1: Percent sex distribution of total cases

In the present study, Reactive Lymphadenitis was the most common lesion encountered with 42.8% prevalence (N-163/380) overall, with most cases in first decade (0-10, N-62/163; 38%); followed by Tubercular /Chronic Granulomatous lesion (N-

146/380; 38.4%) and then Acute Suppurative Lymphadenitis with 41 cases. Least common was Malignant lesion (30/380; 7.9%), with increasing uptrend in cases after 4th Decade (Table 2 & Figure 2).

Table 2: Age wise Distribution of Different Lesions

| Age wise Distribution | Reactive | Tubercular | Pyogenic | Malignant | Total |
|-----------------------|----------|------------|----------|-----------|-------|
| 0-10 | 62 | 09 | 12 | - | 83 |
| 11-20 | 45 | 43 | 04 | 01 | 93 |
| 21-30 | 26 | 54 | 10 | 02 | 92 |
| 31-40 | 13 | 23 | 07 | 02 | 45 |
| 41-50 | 09 | 09 | 02 | 06 | 26 |
| 51-60 | 04 | 05 | 03 | 08 | 20 |
| 61-70 | 02 | 02 | 02 | 07 | 13 |
| >70 | 02 | 01 | 01 | 04 | 08 |
| Total | 163 | 146 | 41 | 30 | 380 |

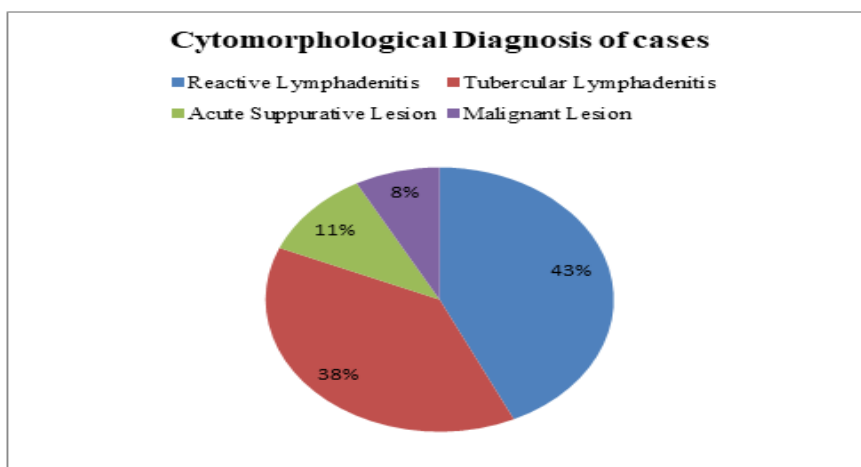


Figure 2: Graphical representation of cases

In terms of gender wise lesion distribution, males have more cases of Reactive Lymphadenitis (102/163-62.5%), while Females were diagnosed with more cases of Tubercular/Chronic Granulomatous

Lymphadenitis (86/146 cases-59.0%). In malignant lesion, Male to Female Ratio was 4:1 and out of 30 malignant cases, 24 were in males and 6 cases were females. (Table 3 & Figure 3).

Table 3: Gender wise lesion distribution

| Lesion | Male | Female | Total |
|---|------|--------|-------|
| Granulomatous & Tubercular Lymphadenitis | 60 | 86 | 146 |
| Pyogenic abscess/Acute Suppurative lymphadenitis. | 24 | 17 | 41 |
| Reactive Lymphadenitis | 102 | 61 | 163 |
| Malignant Lesion | 24 | 6 | 30 |
| TOTAL | 210 | 170 | 380 |

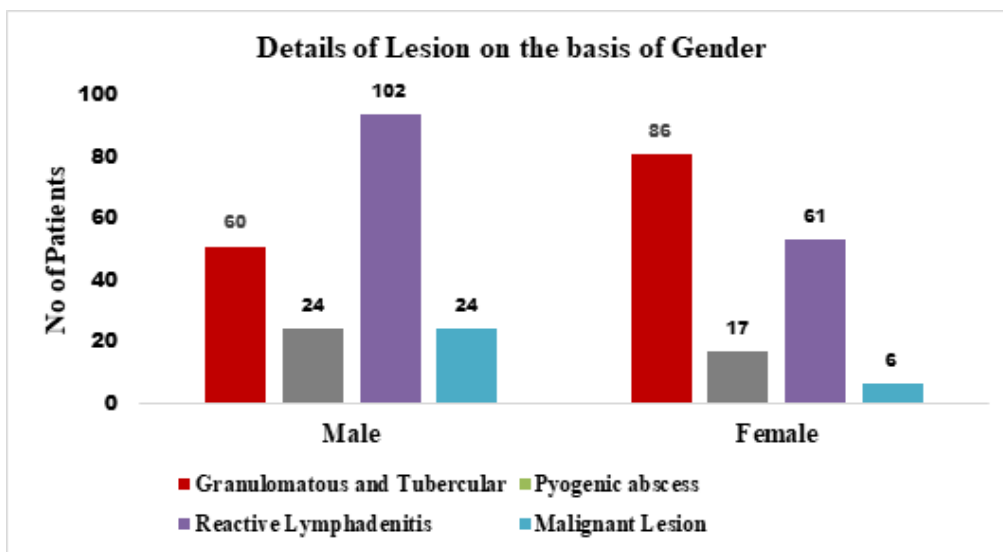


Figure 3: Gender wise distribution of lesions

In Malignant Lesion Group, Most Common lesion was Metastatic Squamous cell carcinoma (76.7%) Followed by Non-Hodgkins Lymphoma (N-5, -16.7%) (Table :4, Figure- 4, Figure-5)

Table 4: Different cases in Malignant lesion

| Malignant Lesion | Total No. | Percent% |
|--------------------------------------|-----------|----------|
| Metastatic Squamous Cell Carcinoma | 23 | 76.7% |
| Non Hodgkins Lymphoma. | 5 | 16.7% |
| Metastatic Papillary cell carcinoma. | 1 | 3.3% |
| Hodgkins Lymphoma. | 1 | 3.3% |
| Total | 30 | 100% |

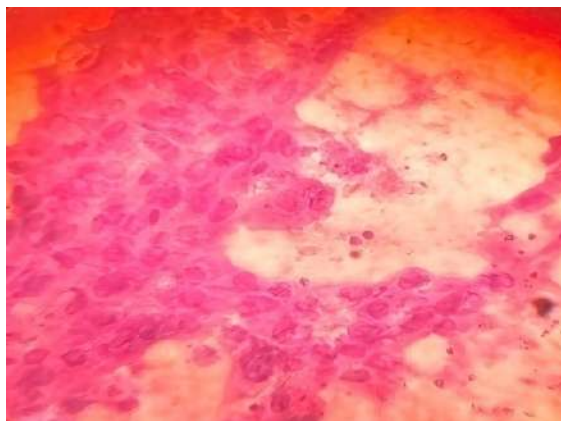


Figure 4: Metastatic deposit of Squamous Cell Carcinoma. (PAP stain 40x)

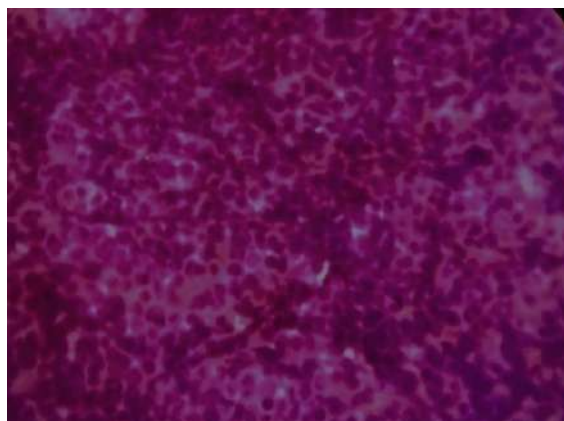


Figure 5: Monomorphous population of lymphoid cells in Non-Hodgkins Lymphoma (PAP stain 40x)

Total 146 out of 380 cases were diagnosed with Tubercular Lymphadenitis/Chronic Granulomatous Lymphadenitis. Since in India, Mycobacterium Tuberculosis is very common reason compared to other Reasons for Granulomatous Diseases, in

this study we considered Epithelioid Granulomas with chronic inflammatory infiltrate with or without Caseous Necrosis as Highly suggestive of Tubercular Lymphadenitis. (Figure:-6, Figure:-7)

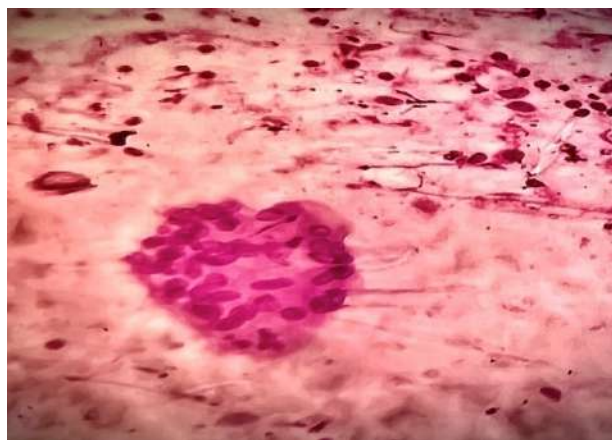


Figure 6: Epithelioid Granuloma with Necrotic Background in Tubercular Lymphadenitis (PAP stain 40x)

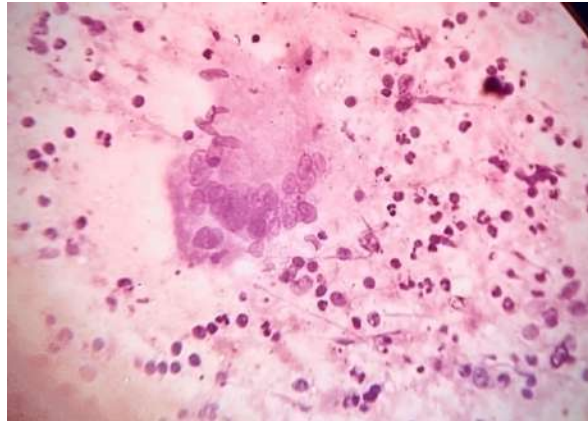


Figure 7: Langhans Type Giant Cell in Tubercular Lymphadenitis (PAP stain 40x)

A total of 41 cases of Acute Suppurative Lymphadenitis were reported in my study. The Commonest level of Cervical Lymph node Involved were Upper Internal jugular (level II), 238/380 (62.6%), with left >

right (133 cases>105), followed by Level V Posterior Triangle level of lymph node 73/380 (19.2%), unilateral multiple involvement of cervical lymph node level was least commonly Seen. (Table 5).

Table 5: Different Level of Cervical Lymph Nodes Involvement with Lesions

| Level of Cervical Lymphadenopathy | Reactive Lymphadenitis | Tubercular and Granulomatous Lymphadenitis | Acute Suppurative Lymphadenitis | Malignant lesion | Total | Percent (%) |
|--|------------------------|--|---------------------------------|------------------|-------|-------------|
| Bilateral Multiple Cervical Lymphadenopathy | 19 | 07 | 01 | 04 | 31 | 8.1 |
| Right side Multiple Unilateral involvement level II-Level V | 02 | 06 | 00 | 00 | 08 | 2.1 |
| Left side Multiple Unilateral involvement level II-Level V | 01 | 00 | 00 | 00 | 01 | 0.2 |
| Right side level II (upper Internal jugular nodes) cervical Lymphadenopathy. | 46 | 38 | 10 | 11 | 105 | 27.6 |
| Right side level V (posterior triangle) cervical Lymphadenopathy. | 12 | 27 | 05 | 00 | 44 | 11.57 |
| Left side level II (upper Internal jugular nodes) Cervical Lymphadenopathy | 56 | 44 | 20 | 13 | 133 | 35.0 |
| Left side level V | 09 | 17 | 01 | 02 | 29 | 7.63 |

| | | | | | | |
|---|-----|-----|----|----|-----|------|
| Cervical (posterior triangle Lymphadenopathy) | | | | | | |
| Submental Region level I | 18 | 07 | 04 | 00 | 29 | 7.63 |
| Total | 163 | 146 | 41 | 30 | 380 | 100 |

Reactive Lymphadenitis was the most common lesion Involved in Upper Internal jugular level of nodes (level II), were as Posterior Triangle (Level V) Group of Lymphadenopathy was commonly involved in Tubercular Lymphadenopathy. Malignant Lesion and Metastatic deposits prefers upper internal Jugular group of Nodes (Level II).

Discussion:

Peripheral Lymphadenopathy is response to symptomatic or asymptomatic Inflammation. Cervical Group Lymphadenopathy is a common clinical Manifestation Presented by Patients. FNAC is safe option to patients presented with peripheral Lymphadenopathy as it is Simple, Non-invasive, cheap & cost effective with Good Sensitivity. In My study maximum number of cases were seen in Second and Third decade of life (11-20, 21-30) which was similar in study conducted by Chaithra et al [1], Mohite et al [2], vimal et al [3], Singh et al [4], Baji et al [5] all had similar age group involvement. A slight Male Predominance was seen in my study 1.2:1 ratio which correlated with study conducted by Chaithra et al [1], Mohite et al [2], Vimal et al [3] Baji et al [5], Sharma et al [6], Kumar et al [7], Meena et al [8], Shrestha AN et al [9], Kadam et al [12]. Study Conducted by Bhavani C et al [10], Amruta et al [11] had Female Predominance Which did not correlated with My study. Present study, Reactive Lymphadenitis was most common lesion observed (N-163/380 -42.8%) which correlated with Chaithra et al [1], Vimal et al [3], Meena et al [8], Shrestha AN et al [9], though contrasting results were observed in Mohite et al [2], Baji et al [5],

Sharma et al [6], Kumar et al [7] (Table-6). Reactive Lymphadenitis was most common in First decade of life. It is common cause of Lymphadenopathy due to Bacterial, viral or Nonspecific causes, Upper airways, Ear, Upper Aerodigestive Tract infections drain in cervical group of Lymph nodes and children are susceptible to these infections. Second most common lesion observed was Tuberculous Lymphadenopathy (N-146 cases-38%) though many studies on cervical Lymphadenopathy especially India shows Tubercular Lymphadenopathy as most common Lesion observed, Mohite et al [2], Singh et al [4] Baji et al [5] Sharma et al [6]. As Tubercular Lymphadenopathy being most common cause of Granulomatous Lymphadenitis in India, I have considered Epitheloid Granulomas, with or without caseous necrosis as Suggestive of Tubercular Lymphadenitis. In terms of Gender distribution Females cases were more than Males which could be due to Poor Nutrition status, Socio Demographic Profiles, Societal and Poor economic Profiles of the Family especially in developing country like India as well as behavioural differences. Ramanathan et al [16], Bothamley G et al [17] suggests a fundamental difference of immunity and hormonal influence as the underlying cause for more cases of Tubercular Lymphadenitis in Women. Malignant Lesion Total 30 cases were seen in which 24 cases were of Metastatic deposits, Rest were Primary Lymphoid Neoplasms. [18] Malignant Cases shows increase uptrend after 4th decade. Metastatic Squamous cell carcinoma were most common in Metastatic Lesion, one case of metastatic Papillary carcinoma of thyroid was seen. These findings corroborated with studies

done by Chaithra et al [1], Vimal et al [3] Sharma et al [6], Bhavani et al [10]. Cervical Group of Lymph Nodes drain Nasopharynx, floor of mouth, Upper Aerodigestive tract, frequently Harbor Metastatic deposits from these primary sites. Strong Male Predominance were seen with in malignant lesion (Male: Female Ratio -4:1) as compared to overall study ratio of 1.2:1. Which also be the reason due to smoking and gutkha chewing. Primary Malignancy - Non-Hodgkins Lymphoma cases were 5 and single case of Hodgkins Lymphoma was seen. Findings for Lymphoid Neoplasms Mainly depends on Monomorphous Population of Atypical Lymphoid cells, Though Flow Cytometry and Immunochemistry Plays much Important

role in subtyping of Lymphoid Neoplasms. 41 cases of Acute Suppurative Lymphadenitis were found with Males more than Females. Predominant Microscopic features were Neutrophils, degenerated cell debris in Blood Mixed Necrotic Background.

In the present study, Upper internal Jugular group of Lymph nodes (Level-II) were most common level of Cervical Group of Lymph nodes Involved for Reactive Lymphadenitis and Metastatic Lesion, followed by Posterior Triangle Group of Lymphnodes (Level V), which was most common level involved in Tubercular Lymphadenitis. These findings were also seen in studies by Mohite et al [2], Amruta et al [11], B C Jha et al [14], Pradeep et al [15].

Table 6: Comparison of results of present study with previous studies

| Studies | Reactive | Tubercular | Pyogenic | Malignant | Total |
|---|----------|------------|---------------------------------|-----------|-------|
| Chaithra et al ¹ 2020. | 38 | 30 | 15 | 23 | 106 |
| Mohite et al ² 2019. | 30 | 96 | 32(Non-specific lymphadenitis.) | 17 | 175 |
| Singh et al ⁴ 2019 | 20 | 61 | 06 | 13 | 100 |
| Shaker N Baji et al. ⁵ 2014. | 624 | 898 | 122 | 306 | 1905 |
| Sharma et al. ⁶ 2021 | 87 | 137 | 16 | 60 | 300 |
| Harsh Kumar et al. ⁷ 2013 | 95 | 104 | | 15 | 214 |
| Bhavani et al ¹⁰ 2014 | 94 | 112 | 26 | 33 | 265 |
| Kadam et al ¹² 2020 | 40 | 44 | 06 | 16 | 106 |
| Present Study | 163 | 146 | 41 | 30 | 380 |

Conclusion:-

Cervical Lymphadenopathy is very common presentation for Head & Neck infection. FNAC proves to be Safe, Simple, Inexpensive Procedure to Diagnose Cervical Lymphadenopathy Cases. Most common lesion for Cervical Lymphadenopathy was Reactive Lymphadenitis in my study followed by Tuberculous Lymphadenitis. Though

Many studies Shows Tuberculous Lymphadenitis as most common cause for Cervical Lymphadenopathy. Metastatic lesion increases with age and hence an important screening procedure to rule out Malignancy and helps in avoiding much invasive procedure of excision Biopsies and unnecessary surgeries in non surgical conditions ,also helps in Treatment& Management Plan. Since the

Great majority of Cervical lymphadenopathy cases seen are Reactive, this approach has obvious Practical, Economical and Psychological advantage to Patients. FNAC should be followed with ancillary testing of Histopathology, Flow Cytometry, Cytogenetic Correlation, Radiological investigation For Final Confirmation of Diagnosis.

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Institutional Ethical Committee Approval: Approval Taken Before the Study.

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References:-

1. Chaithra S, Deoshree Solanki, Prabhu H Mural. Cytomorphological Study of Lymph Node Lesions: A Study of 130 Cases. *Indian J Pathol Res Pract* 2020; 9(2 Part I):27–32.
2. Mohite, Anjana, Seema S. More and R Mane. Clinico-pathological study of cervical lymphadenopathy at tertiary care centre. *MedPulse International Journal of ENT*. 2019;12(3):75-78.
3. Vimal S, Dharwadkar A, Chandanwale SS, Vishwanathan V, Kumar H. Cytomorphological study of lymph node lesions: A study of 187 cases. *Med J DY Patil Univ* 2016;9:43-50.
4. Vivek Singh, Deepti Arora, Seema Awasthi, Ashutosh Kumar, Shyamoli Dutta, Shruti Chandak. Cytological Study of Cervical Lymph Nodes with Clinico-Radiological Correlation in Adults. *Int J Med Res Prof*. 2019 May; 5(3):35-39.
5. Baji SN, Anand V, Sharma R, Deore KS, Chokshi M. Analysis of FNAC of cervical lymph nodes: Experience over a two years period. *Int J Med Sci Public Health* 2014;3: 607-609.
6. Sharma, U., Singh, A., Kamra, H.T., Beniwal, A., & Sharma, S. Assessment of Utility of Fine Needle Aspiration Cytology in Patients of Peripheral Lymphadenopathy- Experience of A Tertiary Care Hospital. *Annals of Pathology and Laboratory Medicine* 2021 ;8(8):196-200
7. Kumar H, Chandanwale SS, Gore CR, Buch AC, Satav VH, Pagaro PM. Role of fine needle aspiration cytology in assessment of cervical lymphadenopathy. *Med J DY Patil Univ* 2013; 6:400-4.
8. Meena A, Uike Gajendra, Jatav Jagannath. Cytomorphological Profile and Patterns of Lymphadenopathy. *IJCRR* 2020; 12(24):12-15.
9. Shrestha, Amar & Kunwar, Shova & Adhikari, Anurag & Poudel, Ayusha & Aryal, Barun. Pattern of Lymphadenopathy on Fine Needle Aspiration Cytology in a Tertiary Level Hospital in Kathmandu. *Nepalese Medical Journal* 2018; 1. 97-99.
10. Bhavani, Chandra, M. Neeraja, K. P. Varalakshmi, P. Venkata Ramana Babu, B. Chaitanya and P. Sravani. "Role of FNAC in the Diagnosis of Cervical Lymphadenopathy." *The Journal of medical research* 2 (2014): 599-603.
11. Patil, Amruta S., Kalpana A. Deshpande, Smita Pol, Veena I Pawar, Aparna Shinde and Pooja Suresh Naik. "Cytological Study of Lymph Nodes in Head and Neck Region - Pattern, Reliability and Limitations. - ." *International Journal of Health Sciences and Research* 6 (2016): 134-140.
12. Sameer A. Kadam, Arun T. Miskin, Vijay D. Dombale. Role of FNAC in study of cytomorphological patterns in cervical lymph node. *Medica Innovatica* 2020; 9(2):88-91.

13. Dandapat MC, Mishra BM, Dash SP, et al. Peripheral lymph node tuberculosis: a review of 80 cases. *Br J Surg* 1990; 77: 911–2.
14. B C Jha, A Dass, N M Nagarkar, R Gupta, S Singhal, Cervical tuberculous lymphadenopathy: changing clinical pattern and concepts in management. *Postgrad Med J* 2001; 77:185–187
15. Pradeep Kulal R, Sharvan R. Shanbhag, V. V. M. S. Kumar Dontamsetty, Madhu B. S, Ramu B. K. Clinico-pathological Study of Cervical Lymphadenopathy. *Journal of Evolution of Medical and Dental Sciences* 2015; 4:54.
16. Ramanathan, V. D. et al. A histological spectrum of host responses in tuberculous lymphadenitis. *The Indian journal of medical research* 109. 1999: 212-20.
17. Bothamley G. Sex and gender in the pathogenesis of infectious tuberculosis. A perspective from immunology, microbiology and human genetics. In: Diwan VK, Winkvist A, editors. *Gender and tuberculosis. NHV report. Goteborg, Sweden: Nordic School of Public Health; 1998; 41—53.*
18. IJ, O. ., J, O. J. ., & U, O. B. (2022). Evaluation of the Effectiveness of Intra-operative Low Dose Ketamine Infusion on Post-operative Pain Management Following Major Abdominal Gynaecological Surgeries. *Journal of Medical Research and Health Sciences*, 22; 5(10): 2269–2277.