

Original Research Article.

“UTILITY OF FINE NEEDLE ASPIRATION CYTOLOGY IN STUDY OF VARIOUS LYMPHNODE LESIONS- TERTIARY HOSPITAL BASED RETROSPECTIVE STUDY.”

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Abstract:

Background:

Thyroid lesions are common clinical findings and have reported prevalence of 4-7% of adult populations¹. USG guided FNAC of thyroid gland is a widely accepted, accurate and cost-effective method for treating patient with thyroid lesions especially in cystic and multi nodular lesions harboring malignancy.³ it reduces the rate of unnecessary thyroid surgeries for patients with benign nodules. This technique has been successfully utilized in the diagnosis of many pathological lesions in multiple organs including lung, lymph nodes, bone, thyroid, salivary gland, soft tissue as well as other anatomic regions like head and neck, thorax, abdomen and pelvis.^{2, 3, 4} USG guided Fine needle aspiration cytology is an invaluable, rapid, virtually noninvasive and simple diagnostic procedure, the importance and applicability of which is being increasingly appreciated by clinicians and pathologists worldwide in recent time.⁵**OBJECTIVES:** 1. To classify the thyroid lesions according to The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) 2. To study distribution of diagnostic categories and subcategories according to age and Gender. 3. To analyze the benefit of ultrasound in our daily cytology practice. 4. To study the utility of TBSRTC to predict the malignancy risk. 5. To correlate cytopathology with histopathology, whenever possible. **Result/observation:** In the study period from July 2017 to June 2019 of 24 months, 250 cases of thyroid fine needle aspirations were collected and categorized according to The Bethesda system of reporting thyroid cytopathology, and it was correlated with the histopathological diagnosis whenever possible. Major proportion of the patients (28.8% and 25.2 %) belonged to age group of 21-40 years. Majority of the patients (89.2 %) were females. Majority of the patients (97.2%) presented with satisfactory adequacy rates in cytology as FNAs Majority of the patients (72.4 %) presented with Category II lesions. Majority of the patients (74.49 %) presented with Non Neoplastic lesions. Majority of the patients (31.49 %) presented with Hyperplastic nodule. Majority of the neoplastic lesions (33.68 %) were of Category IV (FN/SFN).Majority of FN/SFN (Category IV) in Histopathology were follicular adenoma which constituting 38.09% of cases. Majority of

ABSTRACT

Background: Lymphadenopathy is one of the commonest clinical presentation of patients attending outdoor department. Fine needle aspiration cytology (FNAC) is simple rapid, accurate, cost effective and minimally invasive diagnostic tool for evaluating various palpable lymph node lesions.

Aim: To evaluate different lesions of lymphnode by FNAC with specific objectives to classify various lesions causing lymphadenopathy into different categories by FNAC.To study the diagnostic role of FNAC in various pathological conditions of lymphnode and differentiate accuracy of FNAC in palpable lesions.

Materials and methods: The present study was done during the period of July 2018 to June 2023 in the department of pathology, GMERS Medical College Junagadh.10 ml syringe and 23/24 gauge needles were used for the procedure, material obtained was taken on slide and smears were prepared. Wet smears were stained with Haematoxylin and Eosin stain and dry smears with Giemsa stain.

Results: A total of 400 cases were assessed. Cytological analysis of lymph nodes were done with maximum cases of chronic non-specific lymphadenitis 24.75% followed by chronic granulomatous lymphadenitis 19.5%. Metastatic lymph node comprised 9.5% followed by Non Hodgkins lymphoma of 0.5%.

Key Words: Lymphnode, Granulomatous, Metastatic carcinoma.

INTRODUCTION

Evolution in medicine is a continuous process. Use of fine needle aspiration cytology (FNAC) for the diagnosis of palpable mass is one of the classical examples. The purpose of aspiration cytology is to obtain diagnostic material for cytological study from organs which do not shed cells spontaneously. The bone marrow, liver, spleen, breast, thyroid gland, lymph node were initially the target of this type of diagnostic procedure. The method now encompasses virtually all organs.(1)

Fine needle aspiration cytology is simple, inexpensive method for obtaining a tissue for diagnosis of superficial and even deeper lesions. The method is used most commonly for the pre-operative assessment of breast lump, lymph nodes, thyroid and other lesions in neck. Modern imaging techniques enables the method extended to virtually any part of the body.(2)

For patients with a known histologically proven malignancy in whom a subsequent enlargement of lymph node occurs, a cytological diagnosis of metastasis helps in avoiding unwanted surgical biopsy for confirming metastasis. In patients without a previous diagnosis of malignancy, FNAC not only confirms metastasis but in most circumstances gives a clue regarding the site of the primary. Furthermore, if cell block material is sufficient, immunohistochemical (IHC) studies can reliably identify the primary site of origin. In cases of lymphoproliferative diagnosis on FNAC, the cytological diagnosis should be followed by histological evaluation for accurate classification of lymphoma and grading.

Lymphadenopathy is one of the commonest clinical presentations of patients attending outdoor department. An etiology varies from an inflammatory reaction to a malignant condition.(3)

MATERIALS AND METHODS

This study was conducted over a 5 year period from July 2018 to June 2023. The study material was taken from 400 lymph node aspirate at that period in our hospital. Not proper stained smears were excluded from the study. A detailed history, clinical examination and relevant investigations were documented. FNAC of the enlarged lymph node was performed taking aseptic precautions. FNAC was done with 23/24 gauge needle following standard procedure under aseptic precautions, slides were air dried, fixed with ethyl alcohol and stained by haematoxyline& eosin and giemsa, followed by microscopic examination. All FNAC slides are observed and findings are recorded.

RESULTS:

In the present study, fine needle aspiration cytology smears from 400 cases of lymphadenopathy referred to the cytology section of Pathology department, GMERS Medical college & hospital, Junagadh, over a 5 years (ie July-2018 to June-2023), were analyzed.

Various aspects are studied, which are shown below.

The age of the patients ranged from 0-80years old. Majority of the patients were in the age group 21-30 years followed by 11-20 years as shown in the Table-1.

Table 1. Distribution of lymphadenopathy according to age group.

Age range	No. of cases	Percentage
0-10	30	7.5
11-20	82	20.5
21-30	84	21
31-40	78	19.5
41-50	48	12
51-60	44	11
61-70	22	5.5
71-80	12	03
TOTAL	400	100

Out of 400 cases 202 were males and 198 were females as shown in the Table-2

Table 2. Distribution of lymphadenopathy according to gender:

Male/Female	No .of cases	Percentage
Male	202	50.5

Female	198	49.5
TOTAL	400	100

Out of 400 cases 370 patients had single lymph node enlargement and 30 patients had multiple lymph node enlargement as shown in Table 3

Table 3. Number of lymph node enlarged:

Lymph node	No. Of cases	Percentage
Single node	370	92.5
Multiple node	30	7.5
TOTAL	400	100

Most common enlarged site of lymph node was cervical in 268 cases followed by submandibular lymph node in 71 cases as shown in Table 4.

Table 4. Distribution of enlarged lymph node according to site:

Site	No. of cases	Percentage
Cervical	268	67
Submandibular	71	17.75
Axillary	08	02
Inguinal	14	3.5
Supraclavicular	22	5.5
Post-auricular	06	1.5
Sub mental	11	2.75
TOTAL	400	100

Out of 400 cases most common lesion was chronic non-specific lymphadenitis in 99 cases followed by chronic granulomatous lymphadenitis. Malignant lesions were seen in 41 cases, out of which metastasis was seen in 38 cases shown in the table V.

Table 5. Incidence of various pathological conditions in lymph node on FNAC.

Lesion	No. of cases	Percentage
Benign:		
Tuberculosis	66	16.5
Reactive hyperplasia	30	7.5
Acute necrotizing lymphadenitis	02	0.5
Abscess	44	11
Acute on chronic lymphadenitis	16	4
Chronic granulomatous	78	19.5
Chronic non-specific	99	24.75

inflammation		
Subtotal	336	83.75
Malignancy:		
Metastasis	38	9.5
NHL	2	0.5
HL	1	0.25
Subtotal	41	9.27
Inadequate	23	5.75
TOTAL	400	100

Table 6. Distribution of various lymph node lesions according to age:

Lesion		0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Benign:	M									
	F									
Tuberculosis	M	02	09	08	05	02	05	00	00	31
	F	00	08	09	10	02	02	02	02	35
Reactive hyperplasia	M	03	02	02	04	00	00	00	00	11
	F	00	00	09	06	02	02	00	00	19
Acute necrotizing lymphadenitis	M	00	00	00	00	00	00	00	00	00
	F	00	00	01	00	01	00	00	00	02
Abscess	M	00	00	05	07	08	04	02	00	26
	F	02	06	02	02	02	04	00	00	18
Acute on chronic lymphadenitis	M	02	04	02	02	02	00	00	00	12
	F	01	02	01	00	00	00	00	00	04
Chronic granulomatous lymphadenitis	M	00	04	07	02	08	00	00	04	25
	F	01	12	13	16	06	04	02	00	54
Chronic non specific inflammation	M	15	10	05	10	07	04	00	01	52
	F	04	18	15	06	02	02	00	00	47
Subtotal	M	22	29	29	30	27	13	02	05	157
	F	08	46	50	40	15	14	04	02	179
Malignancy:										
Metastasis	M	00	00	00	03	04	08	13	02	30
	F	00	00	00	02	02	04	00	00	08

NHL	M	00	00	00	00	02	00	00	00	02
	F	00	00	00	00	00	00	00	00	00
HL	M	00	00	00	00	00	00	00	01	01
	F	00	00	00	00	00	00	00	00	00
Subtotal	M	00	00	00	03	06	08	13	03	33
	F	00	00	00	02	02	04	00	00	08
Inadequate	M	00	02	02	04	00	02	02	00	12
	F	00	05	04	02	00	00	00	00	11
Grand Total	M	22	31	31	37	33	23	17	08	202
	F	08	51	54	44	17	18	04	02	198

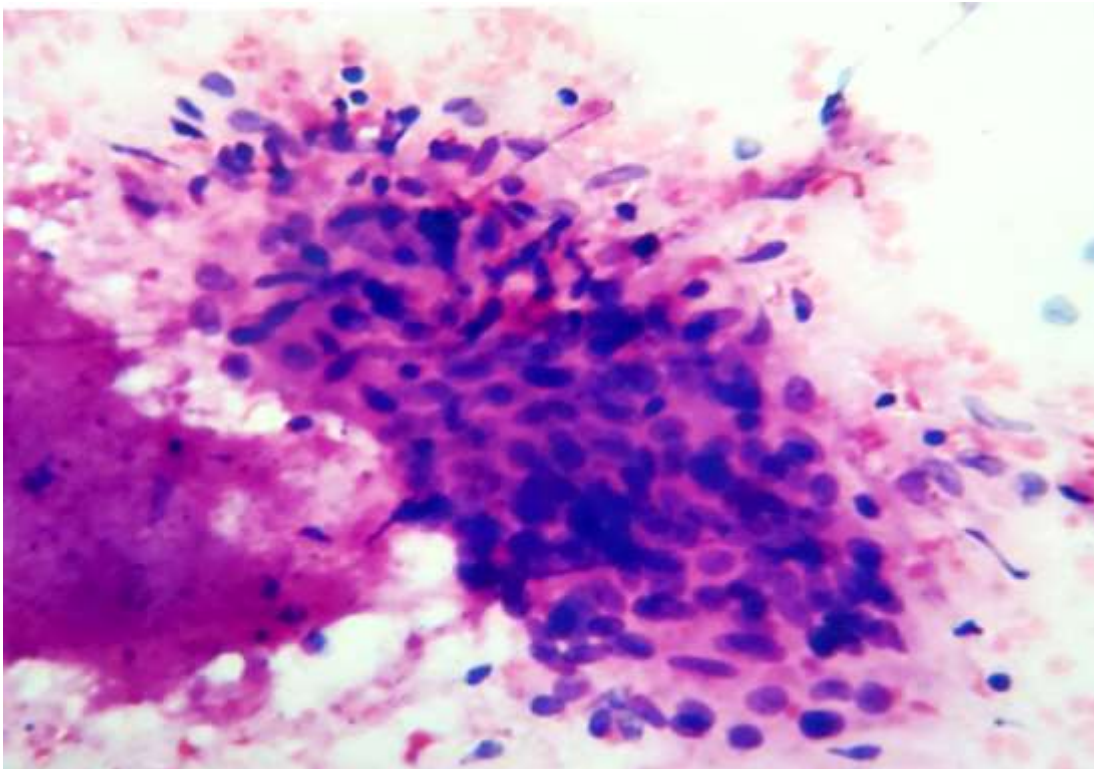


Figure 1: Tuberculous Lymphadenitis: H&E stained smear shows aggregates of epithelioid cells, lymphocytes and caseous necrosis.(1000X)

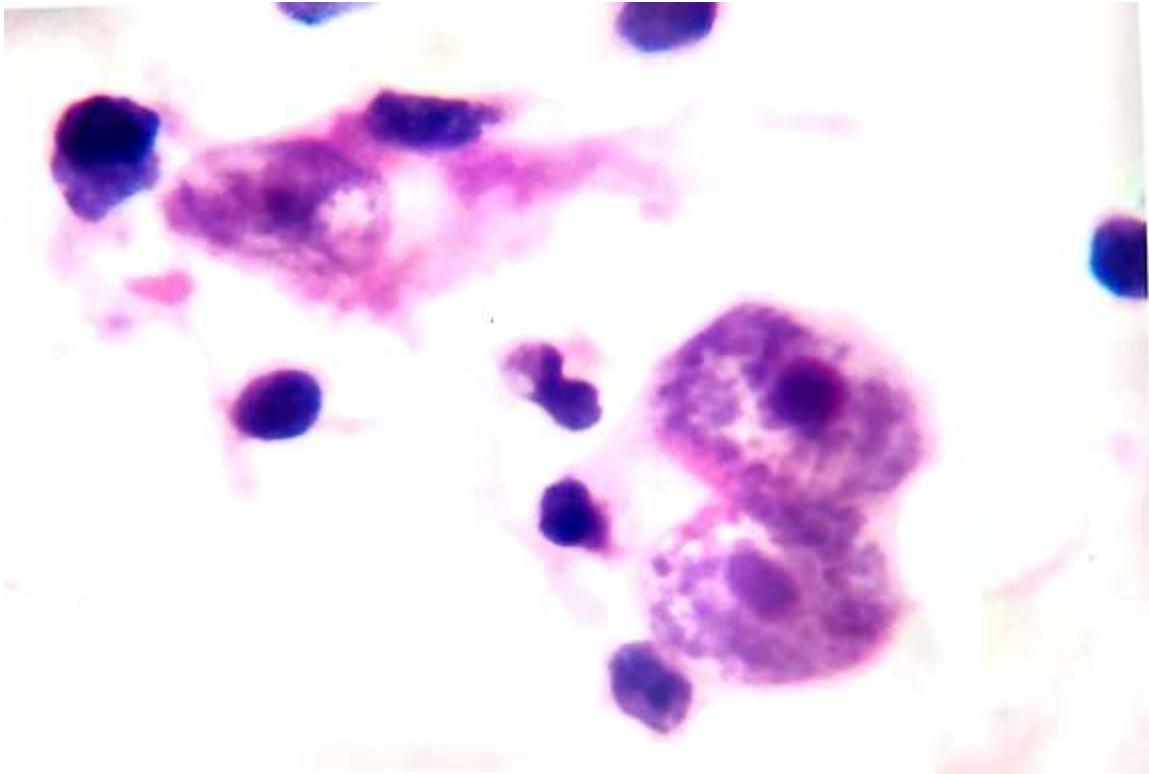


Figure 2 : H&E stained smear shows Reed-Sternberg cell and atypical mononuclear cell.(1000X)

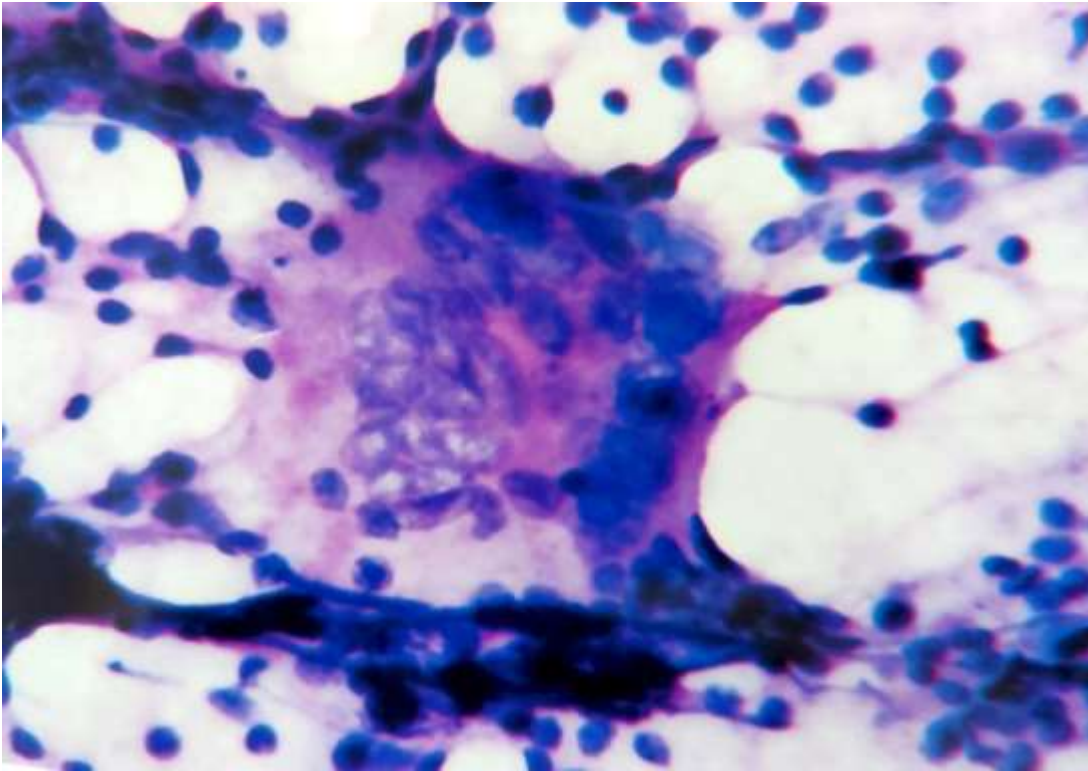


Figure 3: H&E stained smear shows foreign body giant cell (1000X)

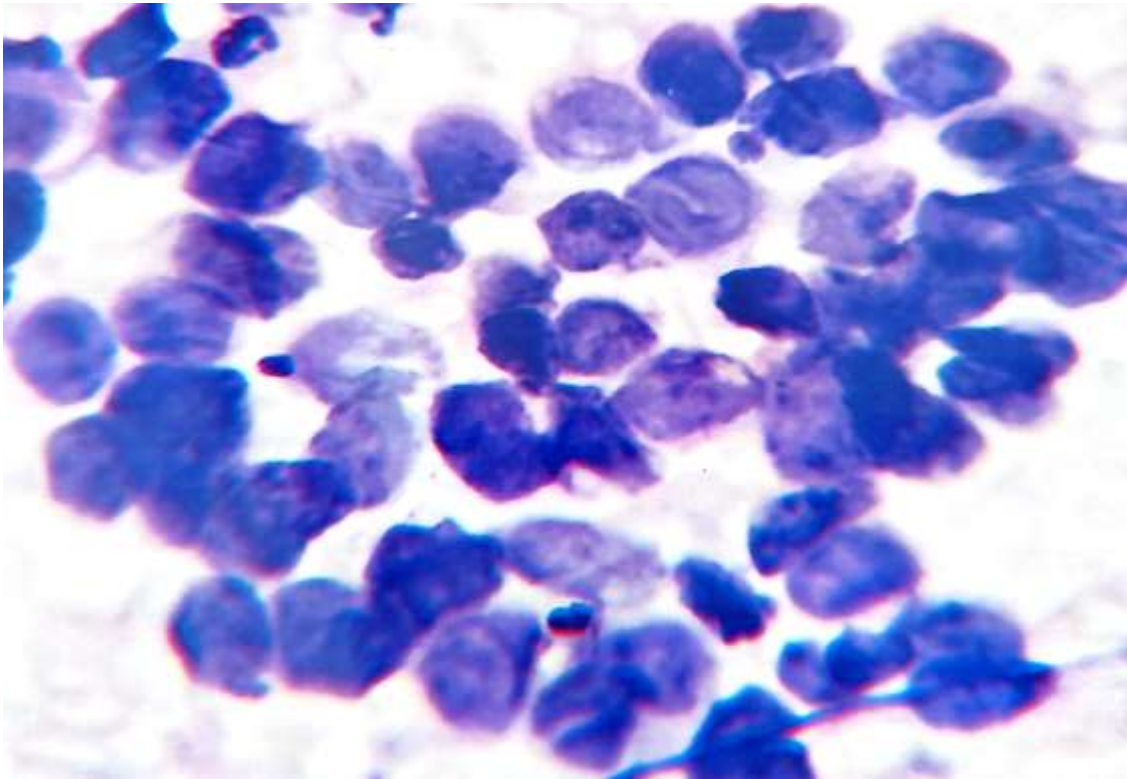


Figure 4: H&E stained smear shows malignant cells (1000X)

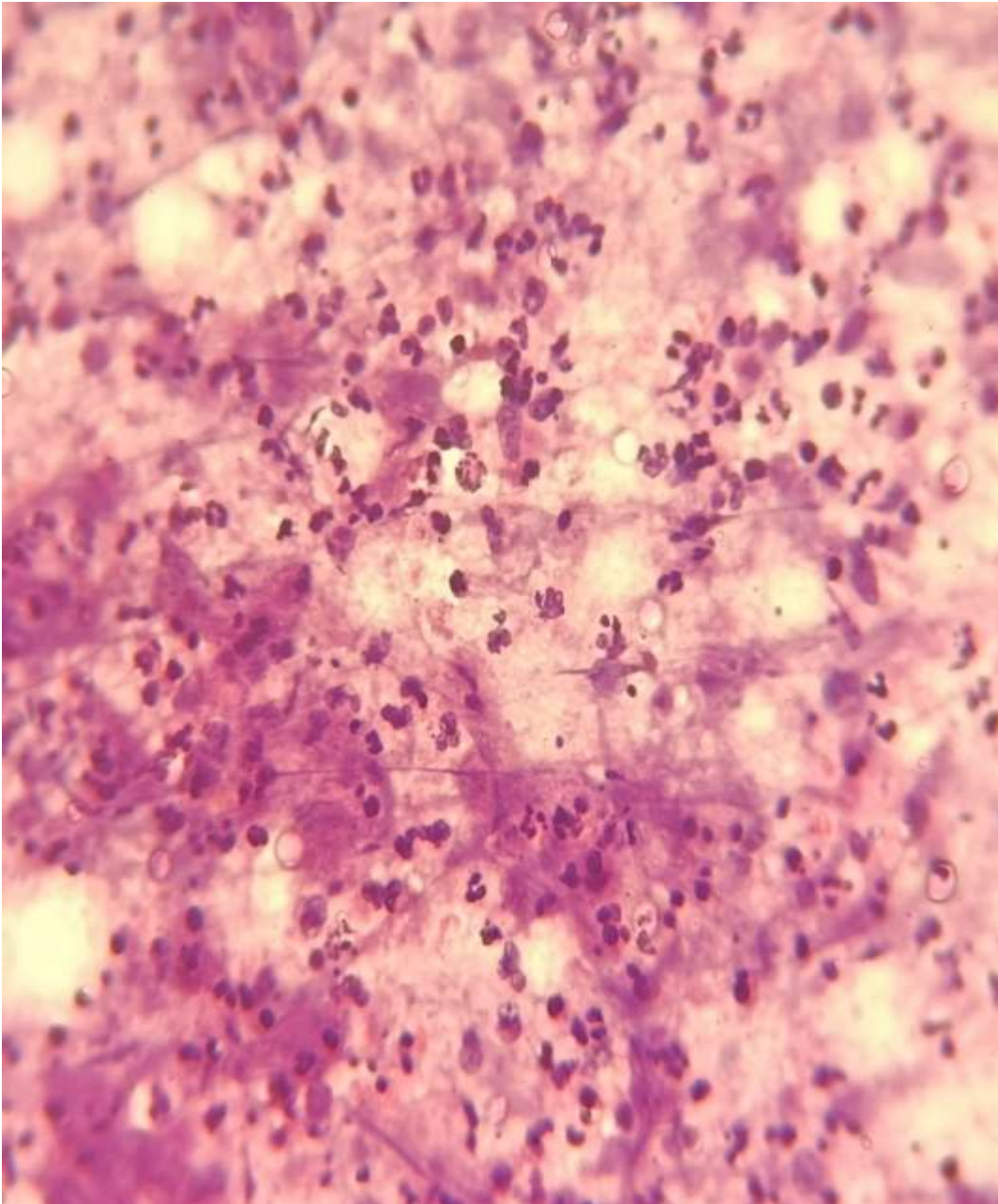


Figure 5: Acute lymphadenitis, H&E stained smear shows acute inflammatory cells (polymorphs), necrotic debris and lymphocytes.

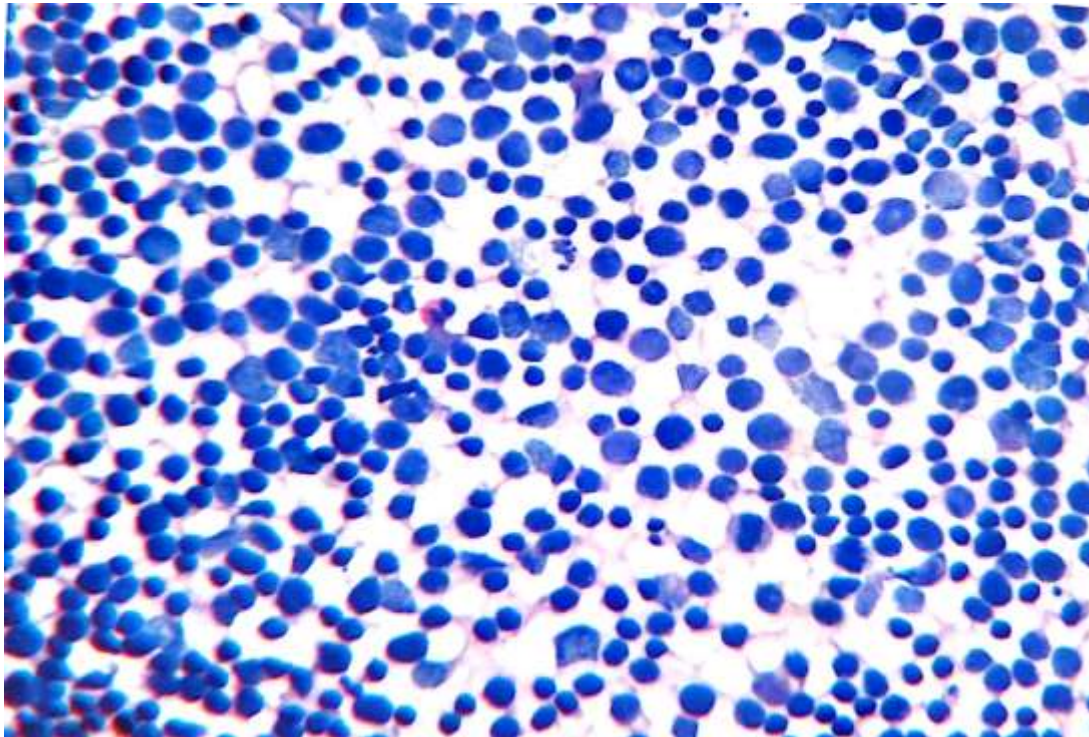


Figure 6: H&E stained smear shows Non-Hodgkin's Lymphoma.

DISCUSSION:

In present study, fine needle aspiration cytology smears from 400 cases of lymphadenopathy from pathology department, GMERS Medical college & hospital Junagadh, over a period of 5 years (June-2018 to July-2023), were analysed in the cytology section of Pathology. Various aspects were studied, which are discussed as below.

In this study, we found that FNAC is a highly diagnostic technique in the evaluation of superficial lymphadenopathy of cervical, axillary, and inguinal regions. We also noted that chronic non-specific lymphadenitis was the most common reason for lymphadenopathy followed by granulomatous lymphadenitis. Furthermore, in the younger age group, reactive lymphadenopathy was more common, in contrast to the older age group where metastatic carcinoma was more frequent.

In most cases we got satisfactory aspirate for confident cytological diagnosis. We got unsatisfactory aspirate only in 5.7% cases which is in accordance with most of the literature and Nitin Chawla et al. (4)

The age of the patient ranged from as young as 1 years up to 80 years old. Majority of the patients were in the age group 21-30 year (21.0%), followed by 11-20 years (19.5%) [Table 1], which correlate well with results reported by other studies. Young adults (15-30yrs) were most commonly affected by lymphadenopathy in our study. This finding is in accordance with most of the literature. In few studies older population (>40yrs) was most predominant group (SumyraKhurshidQadri et al (5).

The most commonly involved group of lymph nodes were cervical (67%). similar findings was reported by Pandit et al (3) (72.65%), followed by submandibular (17.75%), supraclavicular (5.5%), inguinal (3.5%), post-auricular (1.5%) and axillary (0.5%). Generalized lymphadenopathy was observed in 4 cases (2.0%). Cervical group has been reported as the most frequently affected lymph node by various authors.

Male population was little more common in our study group compared to female population, which correlate well with results reported by Nitin Chawla et al, and SumyraKhurshidQadri et al.(5)

In our study suppurative lesions were more common in males than females where as metastatic lesions were more common in males compared to females which is in accordance with SumyraKhurshidQadri et al.(5) There is not much difference in incidence of lymphadenopathy between male and female population when it comes to tubercular lymphadenopathy.

The most common lesions of lymphadenopathy in our study was chronic nonspecific lymphadenitis which is in accordance with Nitin chawla et al(4), 7 Ripunjaymohanty et al(6), 9 Duraiswami et al(7), 10 Atulshrivastav et al.(8) chronic nonspecific lymphadenopathy is predominant cause in paediatric age group in accordance with most literature and AtulShrivastav et al.(8) However in few literature (MangalGoneppanavar et al(9), Kandakuri Mahesh Kumar et al(10) Granulomatous lymphadenitis and Tubercular lymphadenitis were more common than reactive non-specific lymphadenitis. It could be because their study composed more of adult population than paediatric population as granulomatous lymphadenitis is most common cause of lymphadenitis in case of adult population as per most literature. Even in our study the group composed of granulomatous lymphadenitis, necrotising granulomatous lymphadenitis, necrotising lymphadenitis and tubercular lymphadenitis together constituted most common group than reactive group assuming that most cases of granulomatous inflammation in Indian context are because of tuberculosis. In our study also adult population is predominant than paediatric population. In that sense,

Metastatic lymphadenopathy group was more common in our study as compared to primary lymphnode malignancy like Hodgkins and non-Hodgkin's lymphoma.

Conclusion:

Fine needle aspiration cytology (FNAC) is simple rapid, accurate, cost effective and minimally invasive diagnostic tool for evaluating various palpable lymph node lesions. It significantly reduced unnecessary surgical excision for diagnosis of lymphadenopathies in our case. The most commonly affected age group was 21-30 years whereas least common was 71-80 years. Most common pattern of involvement was single and unilateral lymphadenopathy. Major site of involvement was cervical region followed by submandibular. Predominant lesion was chronic non-specific and granulomatous inflammations and least common was primary malignancy of lymph node. Amongst malignant lesions metastatic lymphadenopathy was most common.

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