



DIFFERENTIAL DIAGNOSES OF SUPPURATIVE LYMPHADENOPATHY ON FINE NEEDLE ASPIRATION CYTOLOGY

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Article Received on 22/10/2020

Article Revised on 11/11/2020

Article Accepted on 01/12/2020

ABSTRACT

Background: Suppurative lymphadenopathy constitutes one of the most common findings during fine needle aspiration, the smears should be evaluated meticulously as the causes could be diverse than the usual differentials.

Methods: All the cases of suppurative lymphadenopathy aspirated in Tilak Pathology, Gorakhpur during March 2019 to February 2020 were evaluated. Cytological study of all the cases was performed and interpreted. **Results:** A total of 318 cases were evaluated. Tuberculous lymphadenitis was found to be the most common cause having a variety of cytological findings, followed by acutely inflamed keratinous cyst, acute suppurative lymphadenitis and rarely metastatic squamous cell carcinoma. **Conclusion:** The differentials of suppurative lymphadenitis have got completely different management protocols and thus it is imperative to diagnose them correctly on fine needle aspiration cytology.

KEYWORDS: Suppurative, Lymphadenopathy, Cytology, FNAC, Tuberculosis, Carcinoma.

INTRODUCTION

Fine needle aspiration cytology (FNAC) of lymph nodes is a minimally invasive and cost effective procedure used for diagnosis of various causes of lymphadenopathies and prevents unnecessary excision biopsies, however, it is of vital importance that the smears be evaluated carefully as the differential diagnoses of suppurative lymphadenopathy mostly constitute infective etiology but rarely malignant cause could be found. Tuberculosis and malignant neoplasm may coexist at times.^{[1][2]} and if proper sampling is not done in these cases one of the two might be missed.^[3]

There has been an increase in number of cases of tubercular infections, especially in immunocompromised & HIV infected patients, becoming a major cause of morbidity and mortality.^[4] The incidence of tuberculous lymphadenitis is high in our country^[5], probably due to increased population density.

MATERIALS AND METHODS

Study Design: A prospective comparative analysis.

Time period of study: The study was carried out from March 2019 to February, 2020.

Ethical matter: Informed consent was taken in all cases for procedure as well as inclusion in the study.

Inclusion criteria: Patients with cervical, supraclavicular, submandibular, submental, axillary or inguinal suppurative lymphadenitis were be selected.

Exclusion criteria: Patients in whom an accurate diagnosis could not be reached based on cytological features or ancillary staining methods and in whom follow up was lost.

Methodology of study: Detailed clinical history was collected from the patients and informed consent was obtained. Clinical examination findings were recorded. Confirmed diagnosis was given after cytopathological examination and Ziehl-Neelsen stained smear examination, which was performed in all the cases. In 27 patients, TB-PCR was done for confirmation.

RESULTS

We had a total of 347 specimens of suppurative lymphadenitis out of which 318 cases were selected as either an accurate diagnosis could not be reached or follow up was lost.

Symptoms

Local or generalized swelling (lymphadenopathy) was the most common presenting complaint followed by pain at the site and fever. Few patients also complained of pus discharging sinus and weight loss as indicated in the Table 1.

Table 1: Symptoms (chief complaints) of patients having suppurative lymphadenitis.

Symptoms	No. of cases (n=318)
Local or generalized swelling	318
Pain	123
Fever	62
Pus discharging sinus	39
Weight loss	37

Local examination findings

Solitary swelling was the most common local examination finding (n=192). Few patients had multiple swellings at the same site (n=48) while other had either multiple bilateral swellings or multiple swellings at different sites (n=78), i.e., cervical, supraclavicular, submandibular, axillary, inguinal and/or submental.

Table 2: Local examination findings of patients with suppurative lymphadenitis.

Local examination findings	No. of cases (n=318)
Solitary swelling	192
Multiple swellings at same site	48
Multiple swellings at different sites	78
Tender swelling	43

Matted swelling	12
Pus discharging sinus	39
Raised local temperature	83

Table 3: Sites of involved lymph nodes.

Site	No. of cases (n=318)
Cervical swelling	107
Supraclavicular swelling	87
Submandibular swelling	21
Axillary swelling	12
Inguinal swelling	09
Submental swelling	04
Multiple sites	78

Cytological findings

Of the 318 patients, smears from 141 patients showed epithelioid granulomas with caseating necrotic debris while 127 showed only caseating necrotic debris without any presence of granulomatous collections. Smears of 32 patients showed densely scattered acute inflammatory cells with necrotic material. Smears of 15 patients showed mature squamous epithelial cells with anucleate squames and secondary acute suppuration. 3 patients showed scattered malignant squamous epithelial cells.

Table 4: Cytological findings of patients with suppurative lymphadenitis.

Cytological findings	No. of cases (n=318)
Epithelioid granulomas with caseating necrotic debris	141
Caseating necrotic debris without presence of granulomas	127
Acute suppurative lesion	32
Acutely inflamed keratinous cyst	15
Metastatic squamous cell carcinoma	03

Age group distribution

Inflammatory lesions were prevalent in all age groups,

however malignant cases were found in patients over the age of 50 years.

Table 5: Age group distribution of various lesions.

Age group	Epithelioid granulomas with caseating necrotic debris (n=141)	Caseating necrotic debris without presence of granulomas (n=127)	Acute suppurative lesion (n=32)	Acutely inflamed keratinous cyst (n=15)	Metastatic squamous cell carcinoma (n=3)
Infants-10	01	00	05	0	0
11-20	43	54	09	0	0
21-30	52	39	03	1	0
31-40	29	22	10	8	0
41-50	04	07	3	4	0
51-60	08	03	1	2	2
61-70	03	02	1	0	1
71-80	01	00	0	0	0

Sex distribution

Inflammatory lesions were more predominant in females while malignant lesions were predominant in males.

Table 6: Gender based prevalence of various lesions.

Gender	Epithelioid granuloma with caseating necrotic debris (n=141)	Caseating necrotic debris without presence of granulomas (n=127)	Acute suppurative lesion (n=32)	Acutely inflamed keratinous cyst (n=15)	Metastatic squamous cell carcinoma (n=3)
Male	39	40	14	08	3
Female	102	87	18	07	0

Ancillary studies

Ziehl-Neelsen staining was performed in all the smears.

TB-PCR was done in 27 cases. The findings are elaborated in Tables 7 & 8.

Table 7: Ziehl-Neelsen stained smear findings.

Ziehl-Neelsen staining	Epithelioid granuloma with caseating necrotic debris (n=141)	Caseating necrotic debris without presence of granulomas (n=127)	Acute suppurative lesion (n=32)	Acutely inflamed keratinous cyst (n=15)	Metastatic squamous cell carcinoma (n=3)
Positive	48	94	03	00	00
Negative	93	33	29	15	03

Table 8: TB-PCR findings of 27 cases.

TB-PCR	Epithelioid granulomas with caseating necrotic debris (n=141)	Caseating necrotic debris without presence of granulomas (n=127)	Acute suppurative lesion (n=32)
Positive	04	09	02
Negative	00	00	12

DISCUSSION

Tuberculous lymphadenopathy is highly prevalent in India^[5], especially in low socio-economic strata, probably due to high population density, however it remains a worldwide problem.^[6] Many of these cases present with suppurative lymphadenopathy and pose a problem in diagnosis, as many times smears lack well formed or even ill formed granulomatous collections. A total of 318 cases of suppurative lymphadenopathy were selected during a time period of about 1 year and their cytological features were meticulously evaluated.

Most of the patients presented with chief complaint of localized swelling, mostly painless. Others complained of pain and other non-specific findings such as fever & weight loss. 39 patients complained of pus discharging sinus. 78 patients had multiple swellings at different locations. Cervical swelling was the commonest site involved, Khajuria Ruchi *et al*^[5], Chand P *et al*^[7] and Paliwal Nidhi *et al*^[8] had similar findings. 240 patients in our study presented with single palpable swelling out of 300 cases of suppurative lymphadenitis, excluding keratinous cyst & squamous cell carcinoma cases, i.e., 80%. Chand P *et al*^[7] reported patients with single palpable swelling to be 81.6%. 26% patients in our study had swellings at multiple sites, while Chand P *et al*^[7] had reported 18.4% similar cases.

In our study, maximum incidence of tuberculous lymphadenitis was seen in the age group of 2nd decade, followed by 3rd decade and then 4th decade. Mohapatra and Janmeja^[9] also had similar findings with maximum

incidence in 2nd decade followed by 3rd decade. Youngest patient with tuberculous lymphadenitis in our study was five months old infant while the oldest patient was 73 years old. Narang *et al*^[10] had reported minimum age of 4 years with maximum being 70 years, while Chand P *et al*^[7] reported minimum age of 3 months and maximum of 77 years for patients with tuberculous lymphadenitis. Non-tubercular inflammatory disorders were also prevalent in patients below 40 years. Malignant cases were seen in patients older than 50 years in our study.

Tuberculous lymphadenitis was markedly more prevalent in female population. Inflammatory disorders were slightly more prevalent in female population. Chand P *et al*^[7], Narang *et al*^[10] and Mohapatra and Janmeja^[9] also noted female preponderance in their studies. All the malignant cases were seen in male patients, however low number of malignant cases make it insignificant.

In cytological findings of all cases, most patients had epithelioid granulomas with caseating necrotic debris (44.3%), followed by patients with caseating necrotic debris but without presence of any granulomatous collections (39.9%). Others findings were acute suppurative lesion (10.1%), keratinous cyst with secondary acute suppuration (4.7%) and rarely metastatic squamous cell carcinoma with cystic degeneration (0.9%).

Chand P *et al*^[7] in their study of 550 cases had maximum patients demonstrating caseous necrotic material with

degenerated inflammatory cells without epithelioid cell granulomas (34.4%), followed by epithelioid cell granulomas without necrosis (28.4%), caseous necrotic material with epithelioid giant cell granulomas and giant cells (21.8%) and caseous necrotic material (15.4%). Paliwal *et al.*^[8], in their study of 176 cases had maximum patients demonstrating only caseating necrosis without presence of epithelioid granulomas (39.2%), followed by patients having polymorphs with necrosis with or without epithelioid granulomas (30.1%). Their study had 16.4% cases with epithelioid cell granulomas with necrosis whereas patients with epithelioid granuloma without necrosis was seen in least cases (14.3%).

Smears demonstrating acid fast bacilli in our study after excluding cases of keratinous cyst with secondary acute suppuration and metastatic squamous cell carcinoma were 48.3%, albeit we did not include non-suppurative tuberculous lymphadenitis in present study. It was 44.54% in study of Chand P *et al.*^[7] and 45.65% in study of Dasgupta *et al.*^[11]

TB-PCR was carried out in 27 patients. All patients with caseating necrosis, with or without presence of granulomas exhibited a positive TB-PCR, while 2 out of 32 cases of acute suppurative lesion (i.e., cases without caseating necrosis or granulomas) were found to have a positive TB-PCR. Rest 12 cases of acute suppurative lesion were found to have negative TB-PCR. Mittal *et al.*^[12] showed a sensitivity of 91.67% when only cases showing necrosis were considered. A sensitivity of 84.6% was demonstrated on PCR by Gupta V *et al.*^[13] Thus TB-PCR must be done in all cases which do not show acid fast bacilli but demonstrate caseous necrosis or acute suppurative inflammation.

CONCLUSION

In conclusion, suppurative lymphadenitis may arise without a preceding pulmonary involvement^[14] and forms a major proportion of cases of tuberculous lymphadenitis, their cytological features must be supplemented with Ziehl-Neelsen stained smears, and if possible TB-PCR if required after evaluation of both cytological features and ZN stained smears. Patients demonstrating acute suppurative inflammation may also rarely have tubercular etiology. Occasionally other causes of suppurative lymphadenitis might be found on cytological examination such as keratinous cyst with secondary acute suppuration, and rarely metastatic squamous cell carcinoma with secondary cystic degeneration, thus it is imperative to evaluate the smears carefully.

ACKNOWLEDGEMENT

The authors of this article would like to thank the patients for giving their consent for the fine needle aspiration procedure as well as the study.

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