



STUDY OF CYTODIAGNOSIS OF CUTANEOUS AND SUBCUTANEOUS LESIONS

Dr. Tulsi Chhadi

Associate Professor, Department of Pathology Indira Gandhi Government Medical College & Hospital, Nagpur

Dr Shyam Chhadi*

Associate Professor, Department of Radiology Government Medical College & Hospital, Nagpur.*Corresponding Author

ABSTRACT

Background: Early and accurate pathological diagnosis of skin cancers is vital. FNAC supposedly gives satisfactory results in diagnosis of nodular skin & subcutaneous lesions.

Objective: To analyse the incidence of cutaneous/subcutaneous lesions by FNAC and to study the accuracy of cytological diagnosis against histopathological diagnosis.

Methodology: In this cross-sectional study, 777 cases of clinically suspected nodular skin & subcutaneous lesions were studied by FNAC and 381 cases were additionally diagnosed histologically.

Observations: Non-neoplastic lesions (45.03%) contributed the most, followed by benign (39.6%) and malignant tumours (15.37%). Total 377 out of 381 cases showed good correlation between cytology and histopathology (diagnostic accuracy-98.95%). The sensitivity, specificity, positive predictive value and negative predictive value of FNAC in the diagnosis of malignancy were calculated to be 100%, 99.48%, 97.61% and 100% respectively.

Conclusion: Cytodiagnosis by FNAC is a reliable screening technique in the evaluation of cutaneous and subcutaneous lesions.

KEYWORDS : FNAC, Cytology, Skin Lesions

INTRODUCTION:

Skin is a remarkably heterogeneous organ. The tumours; hamartomatous, reactive and neoplastic; are more numerous than those produced by any other organ¹. Incidence of skin cancer and its mortality rates are showing rising trends for a while now. By one estimation, skin cancers comprise about 9.5% of all human cancers². In India, the incidence of skin cancer was reported at 1.4%.³ In most of the cases, exact pathogenesis is unknown. It is believed that collagen degeneration by altering the nutrition of epidermis predisposes to the development of solar keratosis, keratoacanthoma, squamous cell carcinoma and basal cell carcinoma etc⁴. Genetic (trichoepitheliomas, nevoid basal cell carcinomas) and geographic factors (UV radiations) also play important role.

Early and accurate pathological diagnosis of skin cancers is of paramount importance from management point of view. Various diagnostic modalities like fine needle aspiration cytology (FNAC) and biopsy are available. FNAC usually gives satisfactory results in cytological diagnosis of nodular skin & subcutaneous lesions⁵. It allows for distinction between benign and malignant tumours and, among the later, between primary and metastatic ones. It also helps diagnose infections presenting as skin nodules (e.g. TB, leprosy)⁵.

The present study aimed to analyse the incidence of cutaneous and subcutaneous lesions by FNAC and to study the accuracy of cytological diagnosis of skin nodules against histopathological diagnosis.

METHODOLOGY:

Study type- Cross-sectional comparative study

Study setting- Tertiary care government hospital

Study Period- 21 months (July 1999-March 2001)

Study Population- Patients attending Skin/Cytology OPD at Government Medical College & Hospital, Nagpur during study period.

Study Sample- 777 patients clinically diagnosed with 'Nodular cutaneous or subcutaneous lesion' (New as well chronic/ulcerated nodules)

EXCLUSION CRITERIA-

- Deep seated lesions
- Refusal to give consent

After written informed consent, subjects were enrolled after due exclusions. All study patients underwent detailed history-taking and clinical examination prior to procuring sample for cytological and histopathological studies.

Cytological sampling was done essentially as an OPD procedure by adopting technique elaborated by Orell et al⁶. Histopathological slides were prepared whenever the excised tumour mass was sent from the surgical side. The cytological and histopathological findings were compared and correlated.

Pearson's Chi-square test was applied along with calculation of Spearman's correlation coefficient. The data was analysed using STATA (version 13.0) software.

The protocol of project was submitted to institutional ethics committee and the project was started after approval.

RESULTS:

This cross-sectional study entailed cytological evaluation of 777 patients clinically diagnosed with nodular cutaneous/subcutaneous lesion during the study period. Out of 777 cases, the smear was inadequate for reporting in 42 cases. Hence further analysis was restricted to the remaining 735 cases.

Non-neoplastic lesions (331, 45.03%) contributed the most, followed by benign (291, 39.6%) and malignant tumours (113, 15.37%) respectively. Maximum number of both non-neoplastic lesions (57.7%) and benign tumours (53.95%) were found to belong to 21-40 years age group; while the prevalence of malignant tumours was maximum (59.29%) in the age group of 41-60 years. Males predominated over females among all the 3 categories of non-neoplastic (1.25:1), benign (1.15:1) and malignant tumours (1.40:1).

Among the non-neoplastic lesions (331, 100%), epidermal cyst (239, 72.2%) was by far the commonest diagnosis on cytology, followed by inflammatory lesions (66, 19.94%) and Pilar cyst (16, 4.84%). Maximum number of epidermal cyst (51%) were found in head and neck region. Most of the inflammatory lesions (66, 100%) were non-specific (49, 74.25%) or of Cysticercosis (10, 15.15%).

Typing of neoplastic tumours revealed Lipoma (242, 83.15%) and

squamous cell carcinoma (46.02%) to be the commonest amongst benign and malignant lesions respectively. (Table 1)

Table 1: Distribution of neoplastic lesions [Benign (n= 291) and malignant (n= 113)]

Lesions	Number of cases	Percentage (%)
Benign (n= 291)		
Lipoma	242	83.15
Other benign mesenchymal tumours	22	7.55
Neurofibroma	13	4.5
Benign adnexal tumours	8	2.75
Hemangioma	5	1.71
Cutaneous Schwannoma	1	0.34
<i>Total</i>	<i>291</i>	<i>100</i>
Malignant (n= 113)		
Squamous cell carcinoma	52	46.02
Metastatic tumours	26	23.0
Basal cell carcinoma	18	15.93
Malignant melanoma	11	9.74
Sebaceous cell carcinoma	6	5.31
<i>Total</i>	<i>113</i>	<i>100</i>

The maximum number of benign and malignant tumours were found in the age group of 31-40 years and 51-60 years, with M:F ratio being 1.15:1 and 1.40:1 respectively. Maximum number of benign tumours were found on the upper extremity, while head and neck were the commonest site for malignant tumour. Out of 26 cases of metastatic skin tumours, 15 were males and 11 were females. Out of 15 males with metastasis to skin, the primary site of malignancy was most commonly found in bronchus in 5 (33.32%) cases; while in females it was found in breast (4, 36.36%). A large chunk of metastatic skin lesions (13, 6 in males & 7 in females) remained without a clue about primary malignancy.

A total of 381 cases were diagnosed both cytologically and histologically, of which 377 cases showed good correlation; giving a diagnostic accuracy of 98.95%. (Table 2)

Table 2: Comparison of cytology and histopathology findings (n=381)

Lesions	Number of cases	
	Cytodiagnosis	Histopathological diagnosis
Non-Neoplastic		
Epidermal Cyst	129	128
Sebaceous Cyst	5	6
Cysticercosis	5	6
Leprosy	4	4
Keloid	2	2
Tuberculosis	1	1
Cystic lesion	1	0
Benign		
Lipoma	177	176
Benign Fibrous Histiocytoma	7	7
Neurofibroma	5	6
Benign Adnexal Tumour	1	1
Schwannoma	1	1
Pilomatrixoma	1	1
Cylindroma	0	1

Malignant		
Squamous Cell Carcinoma	19	19
Basal Cell Carcinoma	13	12
Malignant Melanoma	7	7
Sebaceous Cell Carcinoma	3	3
<i>Total</i>	<i>381</i>	<i>381</i>

In four cases, the cytodiagnosis was not correlating with the histopathological diagnosis. In one case, nature of the tumour was wrongly diagnosed as basal cell carcinoma on cytology, which revealed Cylindroma on histopathology. Out of remaining 3 wrongly diagnosed cases on cytology, one was cystic lesion which later showed Cysticercosis on histopathology. The second and third ones were labelled as fibrolipoma and epidermal cyst on cytology, only to be diagnosed as Neurofibroma and Pilar cyst respectively on histopathology.

Table 3 details the statistical evaluation of FNAC against histopathological examination for the diagnosis of skin and subcutaneous nodules.

Table 3: Correlation between cytological and histopathological examination for benign and malignant tumours

Cytodiagnosis	Histopathological diagnosis		Total
	Benign	Malignant	
Benign	192	0	192
Malignant	1	41	42
<i>Total</i>	<i>193</i>	<i>41</i>	<i>234</i>

The sensitivity, specificity, positive predictive value and negative predictive value of FNAC in the diagnosis of malignancy were calculated to be 100%, 99.48%, 97.61% and 100% respectively.

DISCUSSION:

In this cross-sectional study, 777 cases of clinically suspected nodular skin & subcutaneous lesions were studied by FNAC, of which the smear was inadequate for reporting in 42 cases.

Maximum number of cases (57.82%) were from the age group of 31-60 years, which is slightly higher than that observed by Miyaji et al⁷ (47.6%). This could be due to non-neoplastic lesions forming major chunk of study group. The male:female preponderance observed in our study is in line with the findings of Qui et al⁸, who reported it at 1.5:1.

In the present study, the lesions were grouped under two main categories: non-neoplastic and neoplastic; which contributed 45.03% and 54.97% out of total participants respectively. Among the neoplastic lesions, the benign lesions comprised 39.6% and malignant ones 15.37%. Findings of Graham et al⁹ differed from present study, in that the frequency of malignant lesions was more (63.17%). We observed epidermal cyst to be the commonest non-neoplastic lesion, at 72.2% amongst the non-neoplastic group and 32.51% of all the adequate aspirates. Most of them (51%) were found located in the head and neck region. These finding sits well with the available literature⁷⁻⁹. Out of 239 cases of epidermal cyst, histopathological diagnosis was obtained in 129 cases; 128 of which showed good correlation. This is in agreement with finding of Layfield et al¹⁰. Inflammatory lesions can present as skin nodules. Most of the inflammatory lesions (66, 100%) were non-specific in nature (49, 74.25%). This is in agreement with Bhatia et al¹¹.

Lipoma was the commonest benign neoplastic lesion, comprising 83.15% of all benign tumours and 32.92% of all adequate smears. Majority (41.74%) were located on trunk and abdomen. Histopathological diagnosis was obtained in 177 out of 242 cases of lipomas; 176 out of which showed good correlation. Walaas et al¹² also observed excellent correlation between the two diagnostic modalities for lipomas.

Squamous cell carcinoma (52, 46.02%) was the commonest malignant tumour observed. The prevalence is higher than that observed by Ramzy et al¹³ (37%). Maximum occurrence was on head and neck region. Ormsby et al¹⁴ had documented squamous cell carcinoma to occur more commonly on the exposed surface. Cytohistological correlation was obtained in 19 cases; all of which correlated well.

In all, out of 735 nodular skin & subcutaneous lesions diagnosed on cytology, histopathology was undertaken on 381 cases. Out of these 381 cases, 377 showed good correlation, giving the diagnostic accuracy rate of cytology at 98.95%. Urbach et al¹⁵, in a study of 500 skin nodules, reported the accuracy rate at 97%. Graham et al⁹ observed cytology to be accurate in 88% of cases.

In conclusion, cytodagnosis seems to be reliable screening technique in the evaluation of cutaneous and subcutaneous lesion; along with the added benefits of it being simple, free of complications, virtually painless and admissible as an OPD procedure.

REFERENCES:

1. Ackerman LV. Skin. In: Ackerman's surgical pathology. Vol1; 8th ed. Rosai J, New Delhi, JP Brothers, 1996:106-222.
2. Editorial. Malignant change in preexisting skin lesions. *Jour Ind Med Assn.* 1963;41:317-319.
3. Muley DM. Skin cancer in India. National Cancer Institute Monograph. 1963;10:215-233.
4. Montgomery H. Dermatopathology. New York Hoeber Medical Division, Harper and Row. 1967;2:865-923.
5. Perez-Guillermo, Hernandez G. A diagnosis of cutaneous Leishmaniasis by FNAC: Case report. *Acta Cytol* 1988;32:485-87.
6. Orell SR, Sterret GF. Manual and Atlas of fine needle aspiration cytology. Edinburgh Churchill Livingstone 1992:300-308.
7. Miyaji T. Skin cancers in Japan: A nationwide 5 years survey (1956-60). National Cancer Institute Monograph 1963;10:55-70.
8. Qui JH. Pathological studies on epidermic and appendage tumours and tumour-like lesions: Analysis of 3425 cases. *Chung-Hua-Chug-Liu-Chin.* 1986;8(1):48-50.
9. Graham JH, Bingul O, Urbach F. Papanicolaou smears and frozen sections on selected cutaneous neoplasms. *JAMA* 1961;178:380-385.
10. Layfield LJ, Glasgow BJ. Aspiration cytology and biopsy of primary cutaneous tumours. *Acta Cyto* 1993;37:679-88.
11. Bhatia A, Singh N. Diagnosing granulomatous inflammation of skin. *Acta Cyto* 1999;43:761-66.
12. Walaas L, Kindblom LG. Lipomatous tumours: A correlative cytological and histologic study of 27 tumours. *Hum Pathol* 1985;16:6-18.
13. Ramzy I, Rone R. Squamous cells in needle aspirates of subcutaneous lesions, a diagnostic problem. *Am J Clin Pathol.* 1986;85:319-324.
14. Ormsby OS, Montgomery K. Diseases of skin. 8th edition. Philadelphia Lea and Febiger 1054.
15. Urbach F, Burke EM. Cytodiagnosis of cutaneous malignancy. *AMA Arch Dermatol.* 1957;76:34-50.