Research Article

Fine needle aspiration cytology as a diagnostic tool in nodular skin lesions

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Abstract

Background: Knowledge of cytological patterns of nodular skin lesions guides the pathologists and clinicians in making an initial diagnosis of its etiology.

Objective: To examine the cytomorphological patterns of nodular swellings on skin by fine needle aspiration cytology (FNAC).

Materials and Methods: This is an observational, cross-sectional, hospital-based study, conducted in the provincial hospital of Jammu region, India. FNAC was performed on 155 consecutive patients presenting with nodular swellings of skin. Detailed history and clinical examination was done in every patient. Cytological material was aspirated by using 22-gauge needle and 10-mL plastic syringe with a detachable syringe holder (Franzen Handle). In each case, three alcohol-fixed smears were prepared, first smear was stained with Papanicolaou stain, second with Giemsa stain, and the third one was kept unstained for any further required staining. Results were expressed in percentages and proportions.

Result: Of the 155 patients, maximum cases were benign neoplastic (53%) followed by nonneoplastic cases (44%) and 3% were malignant neoplastic as observed by FNAC. The most common lesions observed were lipomas (38.1%), followed by epidermal inclusion cysts (25.8%), and ganglions (6.5%). Among the malignant neoplastic cases, maximum were metastatic deposits of cancer.

Conclusion: Lipoma is the most common lesion observed. FNAC has provided cytological diagnosis in 100% of the cases with only few suspicious cases being sent for biopsy.

KEY WORDS: Fine needle aspiration, nodular skin lesions, neoplastic skin lesions

Introduction

The lesions afflicting the skin range from nonspecific dermatoses and inflammatory diseases to neoplastic changes of various components of skin.[1] Fine needle aspiration cytology (FNAC) is a rapid, simple, and convenient method to investigate nodules, indurations, and thickenings of skin.[2] But it has found limited application in primary tumors of skin and subcutis presumably because of ease of surgical excision. The type specific diagnosis of skin lesions as benign and malignant especially that of adnexal origin, is often not possible. Despite all this, FNAC is of great value in the investigation of lesions clinically suspected to be metastatic tumor deposits.[3,4] It is also helpful in distinguishing between a reactive process likely to respond spontaneously or respond to conservative treatment and neoplasia. As a supplement to clinical history and findings, FNAC is useful in the management of patients with skin tumors in spite of its limitations with regard to the type of specific diagnosis. So, this study was conducted in a provincial hospital of Jammu, Jammu and Kashmir, India, to examine the cytomorphological features of nodular skin

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lesions by FNAC in the patients presenting with nodular swellings of skin. Despite not being a tertiary hospital of the region and limitations of not having advanced diagnostic modalities and resources, an attempt has been made to diagnose and characterize cytomorphological patterns of nodular swellings of skin with the help of FNAC as it is a rapid and cost-effective outpatient procedure.

Materials and Methods

This study was an observational, cross-sectional, hospital-based study.

Data Collection

All cases of nodular skin lesions referred by the treating physicians or surgeons to the Pathology Department of Government Hospital Gandhi Nagar (secondary care level hospital) of Jammu District of Jammu and Kashmir State were subjected to FNAC as per the judgment of the pathologist for further evaluation. A total of 155 consecutive cases of nodular skin lesions referred over a period of 1 year from January 2015 to December 2015 were studied.

In each case, a detailed history was taken and clinical examination was performed. Information on variables such as patient's age, gender, clinical symptoms, location of swelling, and cytomorphological patterns was studied. After explaining the procedure in detail, consent was taken from every patient. Aspiration was done using a 22-gauge needle and a 10-mL plastic syringe with a detachable syringe holder (Franzen Handle). In each case, three alcohol-fixed smears were prepared, first smear was stained with Papanicolaou stain, second with Giemsa stain, and the third one was kept unstained for any further required staining. Suspicious malignant cases were sent for biopsy at tertiary care level government hospital.

Statistical Analysis

The data are expressed in descriptive statistics measures such as percentages and proportions. Mean and standard deviation are calculated wherever necessary.

Result

The age range of patients was 7 months to 83 years with a mean age of 35.8 years and standard deviation of 16.9 years. Maximum number of cases were present in the age group of 21–30 years (44 of 155, i.e., 28.4%), followed by the age group of 31–40 years (38.2%). Male patients were more in number as compared with female patients with a ratio of 1.2:1. Of the 155 cases studied, maximum cases (82 of 155, i.e., 53%) were benign neoplastic, followed by nonneoplastic (44%), and malignant lesions were the least (3%). Among the nonneoplastic cases, maximum cases were epidermal inclusion cysts (25.8%) followed by ganglions (6.5%). Lipoma was the most common benign neoplastic lesion (38.1%) followed by hemangioma (5.8%). Among the malignant neoplastic lesions, metastatic deposits of carcinoma were more frequently seen. Overall, the most common site involved was the trunk (51 of 155, i.e., 33%), followed by the head and neck region (47 of 155, i.e., 30%). Majority of

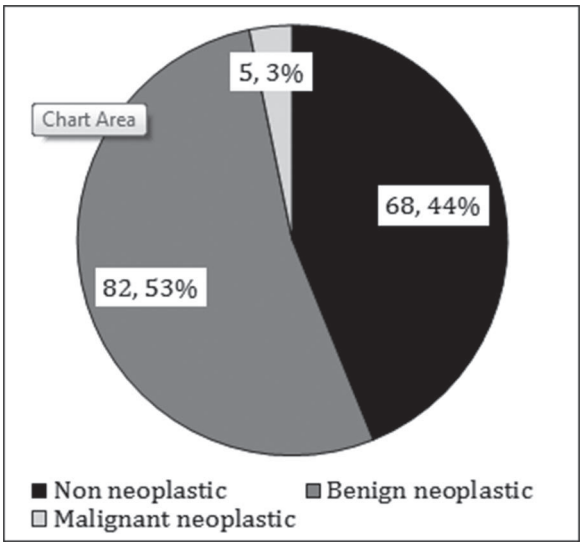

Figure 1: Distribution of cases according to nature of lesion.

Table 1: Age distribution of cases presenting with nodular skin lesions

Age group (in years)	Nonneoplastic *N* (%)	Benign neoplastic *N* (%)	Malignant neoplastic *N* (%)	Total *N* (%)
0–10	3 (4.4)	4 (4.9)	-	7 (4.5)
11–20	12 (17.6)	7 (8.5)	-	19 (12.3)
21–30	24 (35.3)	19 (23.2)	1 (20)	44 (28.4)
31–40	10 (14.7)	25 (30.5)	1 (20)	36 (23.2)
41–50	8 (11.8)	16 (19.5)	2 (40)	26 (16.8)
51–60	6 (8.8)	4 (4.9)	1 (20)	11 (7.1)
61–70	2 (3)	2 (2.4)	-	4 (2.6)
71–80	3 (4.4)	4 (4.9)	-	7 (4.5)
81–90	-	1 (1.2)	-	1 (0.6)
Total	68 (44)	82 (53)	5 (3)	155 (100)

Table 2: Distribution of cases according to nature of lesion on FNAC

Nature of lesion		Type of lesion		No. of cases	Percentage (%)
Nonneoplastic		Epidermal inclusion cyst		40	25.8
		Inflammatory		8	5.2
		Ganglion		10	6.5
		Hematoma		4	2.6
		Parasitic	Cysticercosis	3	1.9
			Cutaneous leishmaniasis	2	1.3
		Gouty tophus		1	0.6
Neoplastic	Benign	Lipoma		59	38.1
		Hemangioma		9	5.8
		Neurofibroma		4	2.6
		Benign spindle cell lesion		5	3.2
		Fibrolipoma		2	1.3
		Pilomatrixoma		3	1.9
	Malignant	Malignant spindle cell tumor		1	0.6
		Metastatic deposits of carcinoma		2	1.3
		Basal cell carcinoma		1	0.6
		Cylindroma		1	0.6
Total				155	100

FNAC, fine needle aspiration cytology.

Table 3: Distribution of lesions according to gender

Nature of lesion *n* (%)		Male *n* (%)	Female *N* (%)	Total
Nonneoplastic		43 (49.4)	25 (36.8)	68 (44)
Neoplastic	Benign	41 (47.1)	41 (60.3)	82 (53)
	Malignant	3 (3.5)	2 (2.9)	5 (3)
Total		87 (56)	68 (44)	155 (100)

the malignant neoplastic lesions were present in the head and neck region (four of five, i.e., 80%).

Discussion

This study was done in a provincial hospital in the region of Jammu among the patients presenting with nodular skin swellings. These nodules were subjected to FNAC in the Pathology Department on referral from treating physician or surgeon. A total of 155 cases were studied over a period of 1 year. The age range of patients was 7 months to 83 years with a mean age of 35.8 years. Maximum numbers of cases were present in the age group of 21–30 years. Of the 155 cases, maximum cases (53%) were benign neoplastic, followed by nonneoplastic (44%), and malignant lesions contributed only 3%. In a study conducted by Jain et al.,[5] the mean age was reported as 43.5 years but regarding the age group having maximum frequency of cases, it corroborated with our study. Study conducted by Singh S in Muzaffarnagar[6] observed maximum number of patients in the age group of 41–50 years. Regarding the order of occurrence of the skin lesions reported in our study, similar order was observed in a study by another author.[5] Malignant lesions were least, as suspicious malignant lesions were directly sent for biopsy because the role of FNAC is limited in these cases. The most common lesions observed in this study were lipomas (38%). This finding shows consonance with the fact that lipoma is the most common tumor seen in a community-based FNAC practice.[2] Similar results were published in other studies as well.[5–7] Lipomas were followed by epidermal inclusion cysts (25.8%) and ganglions (6.5%). However, a study had reported maximum cases of lipomas, followed by epithelial keratinous cysts, and inflammatory lesions.[5] Among nonneoplastic lesions, three cases of cysticercosis and two cases of cutaneous leishmaniases were reported. Similar patterns of results were reported by author.[8] Four cases of neurofibromas and three cases of pilomatrixomas were diagnosed among benign neoplastic lesions. This frequency is comparable with the study.[6]

Cutaneous metastasis is often considered as a grave sign for the management of patients presenting with malignancy.[9,10] In our study conducted by Jain M, overall malignant skin nodules by FNAC were reported in 3.1% cases. Among them maximum (40%) were metastatic deposits of carcinomas with the majority of these malignant and metastatic nodules being present in the head and neck region (80%). This is in consonance with the study[6] but Karki et al.[11] observed the most common site of involvement of metastatic skin nodules to be the trunk.

Regarding age group, benign neoplastic lesions were most commonly observed in the age group of 31–40 years,

Table 4: Distribution of lesions according to site involved

Site	Nonneoplastic	Benign neoplastic	Malignant neoplastic	Total (%)
Head and neck	33 (48.5%)	10 (12.2%)	4 (80%)	47 (30.3)
Upper extremity	11 (16.2%)	23 (28%)	-	34 (21.9)
Trunk	13 (19.1%)	38 (46.3%)	-	51 (33)
Lower extremity	11 (16.2%)	11 (13.4%)	1 (20%)	23 (14.8)
Total	68 (43.2%)	82 (53%)	5 (3%)	155 (100)

which is similar with the findings of the study.[6] Malignant lesions were present more commonly among the patients of the age group of 41–50 years. The age range of cutaneous malignant metastasis was reported as 40–85 years in a study conducted in Nepal.[11]

Some authors have observed malignant cutaneous lesions in patients above 50 years of age.[5,8] It may seem unnecessary to subject clinically characteristic skin lesions that underwent FNAC to biopsy, but sometimes patients and clinicians become more concerned about the definitive diagnosis and demand immediate reassurance, so histological confirmation becomes necessary. But we must admit the fact that the role of FNAC is limited in primary tumors of skin and its main indication is rapid, noninvasive investigation of suspected metastatic malignancy. Knowing the cytological patterns of skin adnexal tumors helps in further diagnosis and management of nodular swellings of the skin.

Only few large series of fine needle aspiration of primary skin tumors with histologic correlation have been reported.[12–15] One of the largest studies, with a total of 382 cases, recorded only one false positive diagnosis.[12]

Strength of Study

An effort has been made to diagnose maximum skin lesions by FNAC. It has provided cytological diagnosis in 100% of cases, which helped clinicians in the further management of lesions.

Limitation of Study

Due to limited resources available in a district hospital, biopsy of few suspicious cases had to be referred to tertiary care center.

Conclusion

Most common nodular skin lesions observed in this study were lipomas, followed by epidermal inclusion cysts and ganglions. Most common metastatic deposits of skin reported in this study were malignant neoplastic lesions. This study has provided cytological diagnosis in 100% of the cases.

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