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Scrape cytology as an adjuvant to histopathology in a tribal setup

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Abstract
Introduction: *Cytology is being used commonly for intra operative diagnosis to know the nature of the lesion and extent of surgical margins. It can also be used in as an adjuvant to histopathology in surgical camps in tribal areas, where the patients are inadvertently lost to follow up, it becomes difficult for operating surgeons to plan the course of action specially in cases of borderline or frankly malignant lesions*
Material and Methods: *The study was conducted in a rural hospital in Maharashtra and included 30 tribal patients posted for surgery. Detailed clinical history and significant findings were noted. FNAC was performed a day before the surgery. FNAC smears were fixed in absolute alcohol & stained with rapid PAP and rapid Hematoxylin and Eosin stain. Diagnosis on FNA and scrape was given. Excision biopsies and specimens histopathological examination was done and was correlated with ytology.*
Results: *The present study included 30 cases. The diagnostic accuracy of the FNAC was found to be 93.3% while that of scrape cytology was found to be 96.6%.*
Conclusion: *Scrape cytology has an advantage of being a simple, quick, safe and accurate method for diagnosis at the time of surgery, so that it is helpful to the surgeon to provide complete treatment to the patients who are lost to follow up.*
Keywords: *FNAC, scrape cytology, histopathology.*

Introduction

Cytology is being used commonly for intra operative diagnosis to know the nature of the lesion and extent of surgical margins. It can also be used in as an adjuvant to histopathology in surgical camps in tribal areas, where the patients are inadvertently lost to follow up, it becomes difficult for operating surgeons to plan the course of action specially in cases of borderline or frankly malignant lesions.[1,2] FNA (Fine needle aspiration cytology) and scrape cytology, being simple, readily available, time saving, minimally invasive and cost-effective with high sensitivity and specificity have been applied routinely to diagnose various lesions.[2,3] They are an accurate diagnostic tool available to all practicing surgeons even in small hospitals and semi urban hospitals. It would greatly affect the planning of treatment

of neoplastic disease and their course, as the diagnosis can be given intra operatively. This is an alternative simple procedure for frozen section or tru-cut needle biopsy.[4]

Material and Methods

The study was conducted in a rural hospital in Maharashtra and included 30 tribal patients posted for surgery. Detailed clinical history and significant findings were noted. FNAC was performed a day before the surgery. The FNAC procedure was explained and patient's informed consent was taken. FNAC was done using 20cc disposable syringe and 22 gauge needle taking all aseptic precautions. Smears were fixed in absolute alcohol & stained with rapid PAP and rapid Hematoxylin and Eosin stain. Aspirations taken from various sites included breast, thyroid, soft tissue, salivary glands, lymph node and miscellaneous sites. A cytological diagnosis was made on the aspirated material. Scrapes from excision biopsies and specimens were taken, fixed in absolute alcohol and stained with rapid PAP and rapid Hematoxylin and Eosin stain.. Excision biopsies and specimens received were fixed in 10% buffered formalin and processed for histopathological examination. Sections were stained with Hematoxylin and Eosin. Cytopathology and histopathological correlation was done in all the cases.

Results

The present study included 30 cases. Age group of patients ranged from 14 to 70 years. Mean age was 45.4 years. Out of 30 cases evaluated 16 (53.3 %) were malignant and 14 (46.6 %) cases were benign. Tumors ranged in size from 0.8cm to 11 cm. Cyto-pathologic diagnosis were correct as compared to histopathology in 29 cases (96.66%). 1 case (3.33%) were false negative. 1 case of carcinoma misdiagnosed on scrape cytology was proven to be mucoepidermoid carcinoma on histopathology. Thus the diagnostic accuracy of the FNAC was found to be 93.3% while that of scrape cytology was found to be 96.6%.

Table (3) shows that all the benign cases were diagnosed correctly. Among malignant cases, one case was diagnosed as lymphoepithelial carcinoma on cytology (FNA and scrape) which was proven as mucoepidermoid carcinoma on histopathology.

Table 1: Scrape cytology sites of the various lesions

Sr. No.	Site for Scrape Cytology	NO. of Cases	Percentage (%)
1	Breast	8	26.67
2	Thyroid gland	6	20
3	Soft tissue	6	20
4	Salivary gland	3	10
5	Lymph Node	2	6.6
6	Miscellaneous		
	6.1) Foot	1	3.33
	6.2) Penis	1	3.33
	6.3) Endometrium	1	3.33
	6.4) Ovary	1	3.33
	6.4) Testis	1	3.33
	TOTAL	30	100

Table 2: FNAC, Scrape cytology and Histopathology correlation of evaluated lesions

Sr. No.	Site	No. of Cases	Clinical diagnosis	FNAC diagnosis	Scrape Cytology Diagnosis	Histopathological diagnosis
1	Breast	8				
			1) Fibroadenoma	Fibroadenoma	Fibroadenoma	1) Fibroadenoma
			2) Fibroadenosis	Proliferative breast disease	Proliferative breast disease	2) Fibrocystic disease with duct hyperplasia and atypia
			3)Chrondrosarcoma Right breast	Chrondrosarcoma	Chrondrosarcoma	3) Chrondrosarcoma
			4) Carcinoma right breast	Ductal Malignancy	Ductal Malignancy	4) Recurrent IDC
			5) Carcinoma left breast	Ductal Malignancy	Ductal Malignancy	5) Lymphangioma circumscriptum
			6) Carcinoma left breast	Ductal Malignancy	Ductal Malignancy	6) IDC
			7) Carcinoma right breast	Ductal Malignancy	Ductal Malignancy	7) IDC
2	Thyroid gland	6				
			9) Multinodular Goitre	Colloid Goitre	Colloid Goitre	Nodular Goitre
			10) Multinodular Goitre	Multinodular Goitre	Multinodular Goitre	Nodular Goitre
			11) Colloid Goitre	Colloid Goitre	Colloid Goitre	Nodular Goitre
			12) Goitre	Multinodular Goitre	Multinodular Goitre	Nodular Goitre
			13) Goitre	Multinodular Goitre	Multinodular Goitre	Colloid goiter
			14) Goitre	Multinodular Goitre	Multinodular Goitre	Colloid goiter
3	Soft tissue	6				
			15) Dermatofibroma- Left back shoulder	Low grade spindle cell tumor	Low grade spindle cell tumor	Dermatofifbrosarcoma protuberans
			16) Neurofibroma – right back	Benign spindle cell tumor	Benign spindle cell tumor	Benign spindle cell tumor Schwanoma
			17)? Squamous cell Carcinoma – abdominal mass	Low grade spindle cell tumor	Low grade spindle cell tumor	Dermatofifbrosarcoma protuberans
			18) Fibroma- over left foot	Benign spindle cell lesion	Benign spindle cell lesion	Acral fibromyxoma
			19) Lipoma over right side of back	Keratinous cyst	Keratinous cyst	Keratinous cyst
			20) Cystic lesion In knee	Lymphangioma of Knee	Lymphangioma of Knee	Lymphangioma of Knee
4.	Salivary Gland	3				
			21) Left Parotid tumor	Lymphoepithelial Carcinoma	Lymphoepithelial Carcinoma	Mucoepidermoid Carcinoma
			22) Malignant parotid tumor	Pleomorphic Adenoma	Pleomorphic Adenoma	Polymorphous low grade adenocarcinoma
			23) Right parotid tumor	Oncocytoma	Pleomophic Adenoma	Pleomophic Adenoma
5	Lymph Node	2				
			24) Axilllary Metastasis	Axilllary Metastasis	Axilllary Metastasis	Metastasis of Carcinoma breast with Axilllary Metastasis
			25) Tuberculosis	Chronic granulomatous inflammation s/o Tuberculosis	Chronic granulomatous inflammation s/o Tuberculosis	Chronic granulomatous inflammation s/o Tuberculosis
6	Miscellaneous	5				
			26) Squamous cell Carcinoma Left Foot	Melanoma	Melanoma	Melanoma
			27) Carcinoma penis	-	Squamous cell Carcinoma	Squamous cell Carcinoma
			28) Endometrial Carcinoma	-	Endometrial Carcinoma	Endometrial Carcinoma
			29) Carcinoma Left ovary	-	High gradeSerous adenocarcinoma	High gradeSerous adenocarcinoma
			30) Teratoma Testis	-	Seminoma	Seminoma

Table 3: Correlation of cytological diagnosis in benign and malignant cases:

Lesion	Total	Cytology correlation with histopathology		Cytology not correlated with histopathology	
		No.	%	No.	%
Benign	14	14	100	0	0
Malignant	16	15	93.8	1	6.25
Total	30	29	93.3	1	3.3

Table 4: Correlation of cytological diagnosis at various sites with histopathology

Sr. No.	Site	Total	FNAC correlated with histopathology		FNAC not correlated with histopathology	
			No.	%	No.	%
1	Breast	8	8	100	0	0
2	Thyroid gland	6	6	100	0	0
3	Soft tissue	6	6	100	0	0
4	Lymph Node	3	3	100	0	0
5	Salivary gland	3	1	33.3	2	66.6
6	Miscellaneous	5	5	100	0	0
	6.1) Swelling on right foot	1	1	100	0	0
	6.2) Penis	1	1	100	0	0
	6.3) Endometrium	1	1	100	0	0
	6.4) Left Ovary	1	1	100	0	0
	6.5) Testis	1	1	100	0	0

Table 5: Correlation of scrape cytology diagnosis at various sites with histopathology

Sr. No.	Site	Total	Srape correlated with histopathology		Scrape not correlated with histopathology	
			No.	%	No.	%
1	Breast	8	8	100	0	0
2	Thyroid gland	6	6	100	0	0
3	Soft tissue	6	6	100	0	0
4	Lymph Node	3	3	100	0	0
5	Salivary gland	3	2	66.6	1	33.3
6	Miscellaneous	5	5	100	0	0
	6.1) Swelling on right foot	1	1	100	0	0
	6.2) Penis	1	1	100	0	0
	6.3) Endometrium	1	1	100	0	0
	6.4) Left Ovary	1	1	100	0	0
	6.5) Testis	1	1	100	0	0

Table 6: Diagnostic accuracy of FNA and scrape

Sr. No.	Test	Total cases	False Negative	Diagnostic accuracy
1.	FNAC	30	2	93.3%
2.	Scrape cytology	30	1	96.6%

Table 7: Comparison of present study with reference studies

Study	Diagnostic accuracy of FNAC
Sengupta et al[6]	90%
Thangam et al[8]	91.6%
Present study	93.3%

Study	Diagnostic accuracy of scrape cytology
S Kolte[1]	97.3%
Rakesh Mehar et al[7]	92.5%
Present study	96.6%

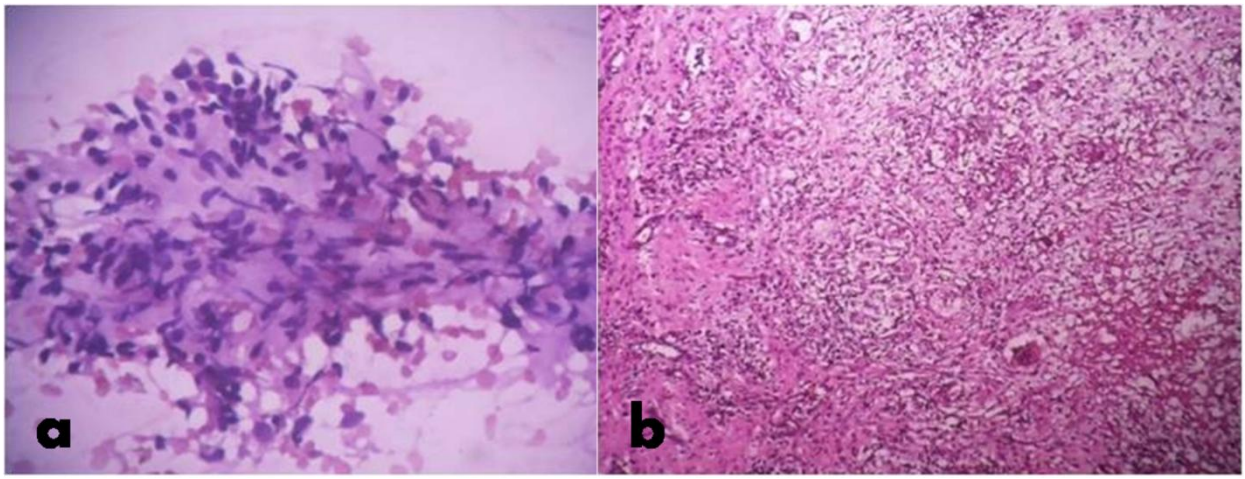

Figure: 1 Scrape Cytology

a. Granuloma and necrosis with epithelioid cells, Rapid PAP, x 10

b. Histopathology - Granulomas, caseous necrosis, epitheiloid cells and giant cells, H and E, x 10

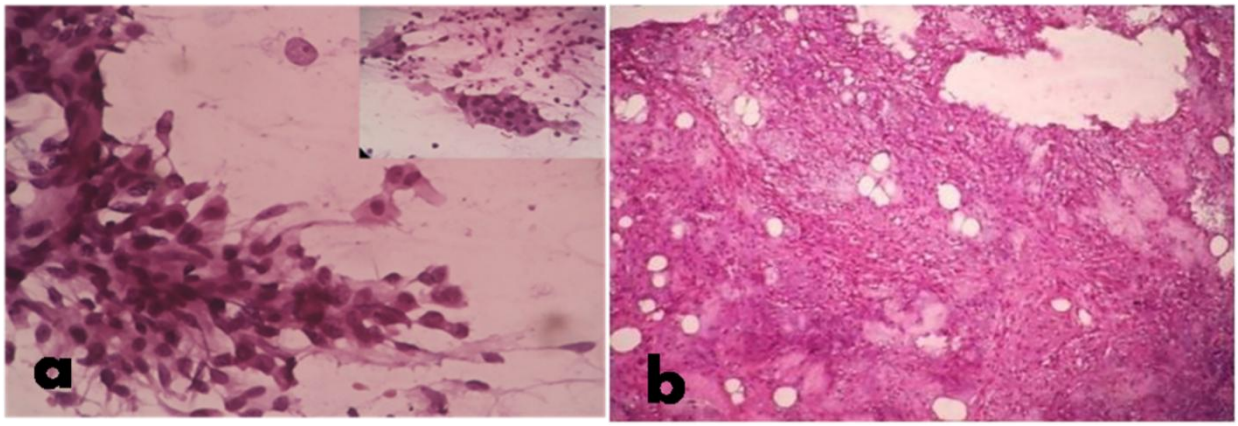

Figure: 2 Scrape Cytology

a. Lymphoepithelial carcinoma. Lymphoid stroma with predominant component of epithelial cells, Rpaid PAP, x 40

b. Histopathology- Mucoepidermoid carcinoma. Mucous and squamous cells can be seen. H and E, x 10

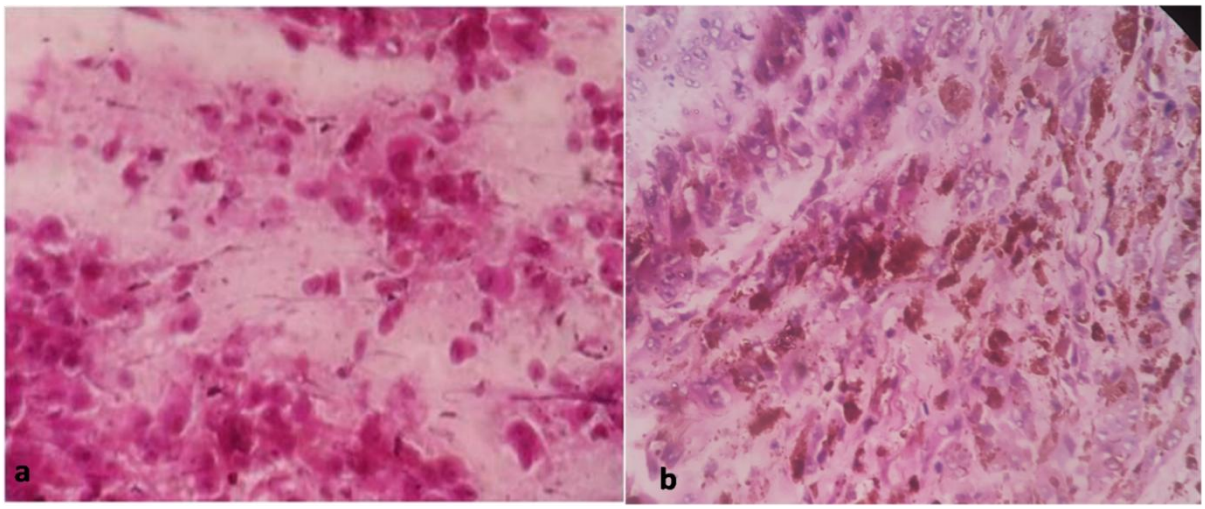

Figure: 3. Scrape Cytology

a. Melanoma Foot. Large pigmented cells with pleomorphism, Rapid PAP, x 40

b. Histopathology- Melanoma. Large pigmented cells with pleomorphism. H and E, x 40

Discussion

The present study was carried out during surgical camp held at a rural hospital with no cytology and histopathological facilities available. The material required for cytological diagnosis was carried in camp with an aim to help the surgeons in pre/ intraoperative diagnosis and treatment.

Majority of the patients were females with male to female ratio of 1:2. The study included patients of all age groups. In our study the predominant site for FNAC was breast followed by thyroid. Scrape was taken of all the specimens received.

In breast lesions 2 cases of benign breast lesion , 1 case of chondrosarcoma, 1 case of Lymphangioma circumscriptum and 4 cases of Invasive ductal carcinoma were diagnosed by FNAC and scrape cytology, which was consistent with histopathology.

FNAC and scrape of thyroid lesions revealed colloid/ nodular goiter (6 cases) as predominant finding and was consistent with histopathology.

In soft tissue tumors, 2 cases of dermatofibrosarcoma, 1 case of schwannoma, 1 case of acral fibromyxoma, 1 case of epidermal cyst and 1 case of lymphangioma was diagnosed on FNA and scrape cytology correlated with histopathology. This was also because of the clinical correlation which was very helpful.

Cytology of supraclavicular lymph node showed a case of chronic granulomatous inflammation and a case of metastasis of breast carcinoma in axilllary lymph node which were consistent with histopathology.

In the salivary gland lesions, one case of Pleomorphic Adenoma was diagnosed on FNA and correlated with scrape cytology and histopathology. Another case of salivary gland swelling was diagnosed as oncocytoma on FNA as the smears revealed monomorphic population of round to oval cells in loosely cohesive groups, abundant granular eosinophilic cytoplasm and eccentric nuclei. The scrape cytology revealed aggregates or discrete epithelial cells with few foci of oncocytic change and hence was diagnosed as pleomorphic adenoma. Histopathologically this case correlated with scrape cytology. This could be because, in FNA the exact position of needle is not always known and it could have hit the area of oncocytic metaplasia and pleomorphic adenoma is known to have varied histology.[9] One case of parotid tumor diagnosed on FNA as lymphoepithelial lesion and confirmed on scrape cytology, was diagnosed as mucoepidermoid carcinoma on histology. This tumor showed many lymphocytes, which probably could have been the reason for the misdiagnosis.

Other cases included Squamous cell carcinoma Penis, Endometrial Carcinoma, high grade serous adenocarcinoma ovary, seminoma testis, melanoma of foot The FNA was not done in Squamous cell carcinoma Penis, Endometrial Carcinoma, High grade serous adenocarcinoma left ovary and seminoma. The scrape of these specimens were consistent with histopathology.

Cyto-histology correlation was done in all 30 cases. Out of all these cases except in one malignant case, the cytological diagnosis (FNA or/ and scrape) were consistent with histopathological diagnosis.

Table (6) shows that, diagnostic accuracy of FNA and Scrape cytology correlate approximately with the diagnostic accuracy of the reference studies. Thus it highlights that FNAC and Scrape Cytology can help to establish correct diagnosis. Rapid PAP also enables good and quick staining. To avoid or minimize false negative results, various factors including regenerative changes, metaplasia and other changes should be taken into consideration while reporting.[5,7] In a tribal population, where patients are lost to follow up, scrape cytology and FNA which are rapid, cost-effective, highly accurate and feasible diagnostic tools, help to arrive at a diagnosis so that clinicians can provide proper treatment to the patients.[6]

Scrape cytology is an open biopsy interpreted on a smear, the report being available immediately to the operating surgeon to make immediate decisions.[7] In the scrape smear the morphological features are so well preserved that it is easy to

make an accurate diagnosis. Scrape is far more superior to frozen sections because cellular morphology is very clear and a definite diagnosis can be made in little time in a rural set up.[4,5] In a developing country like ours which cannot afford a full fledged surgical pathology laboratory even at district level, it is possible to give an opinion on the nature of tumor using these cytological methods. Thus in conclusion, scrape cytology has an advantage of being a simple, quick, safe and accurate method for diagnosis at the time of surgery, so that it is helpful to the surgeon to provide complete treatment to the patients who are lost to follow up.[4,8]

References

1. Kolte S, Satarkar R. Role of scrape cytology in the intraoperative diagnosis of tumor. J Cytol 2010; 27:86–90
2. Kane S. Role of scrape cytology in the diagnosis of ocular surface squamous Neoplasia. Symposium on ophthalmic cytology 2007;24:22-26.
3. Shidham V, Dravid N. Role of scrape cytology in rapid intraoperative diagnosis-Value and limitations. Acta cytologica 1984;28:477-482
4. Joseph L, Rajendiran S, Rao S, Sadiya N. Role of scrape cytology in ovarian Neoplasms. Journal of Cytology 2009;26:26-29
5. N Tohnosu, Nabeya Y, Matsuda M. Rapid intraoperative scrape cytology Assessment of surgical margins in breast conservation surgery. Breast Cancer 1998;5:165-167
6. Gupta S, Gupta V, Gupta M. Correlation of fine needle aspiration cytology with histopathology in the diagnosis of solitary thyroid nodule. J Thyroid Res 2010;18
7. Mehar R, Panchonia A, Kulkarni C. Role of scrape cytopathology in early diagnosis of neoplastic lesions & its histopathological correlation. IJMSPH 2014; 4:489-492
8. Thangam R, Kotasthane V, Kotasthane D, Koteeswaran G, Kannan N. Cytological and Histomorphological correlation of salivary gland lesions- A nexperience at rural tertiary healthcare hospital. APALM 2017;4: