Research Article

Cytohistopathological correlation of head neck and face lesions

Nishant Bawankule[1*], Shubhangi Jibhkate[2]

[1]Assistant Professor, Department of Anaesthesiology, LTMMC and LTMMG Hospital Mumbai, Maharashtra, INDIA.
[2]Assistant Professor, Department of Pathology, Grant Medical College Mumbai, Maharashtra, INDIA.
Email: shubhanish@yahoo.com

Abstract

Context: Fine needle aspiration cytology (FNAC), is of particular relevance in the head, neck and face area because of the easy accessibility of target sites and excellent patient compliance. The important aspect of this technique is to avoid the surgeries in situations like non neoplastic, metastatic lesions. **Aims:** 1. To discuss utility of Fine needle aspiration cytology in diagnosing various head neck face lesions and its usefulness study as preliminary guideline for management of patient. 2. To evaluate diagnostic accuracy of FNAC by correlating cytological and histopathological diagnosis.3.To study the sensitivity and specificity of FNA technique in head, neck and face masses. **Design:** The present prospective study was undertaken in the tertiary care hospital where total 710 cases were studied over 3 years. Materials and **Methods:** In this study Fine needle aspiration cytology study of patients visiting to cytology OPD with head neck face masses were done after evaluating patient with complete clinical details which later on confirmed by subsequent histopathology wherever available. **Result:** Out of 116 histopathologically confirmed cases, concordance between cytologic and histopathologic diagnosis was found in 112 lesions. There was 1 false positive and 3 false negative diagnosis giving diagnostic accuracy of 96.66 %.Sensitivity, specificity, positive predictive value and negative predictive value in present series were 93.18%, 98.66%, 97.67% and 95.94% respectively **Conclusion:** Fine needle aspiration is quick, easy and cost effective office procedure and is suitable for the first line investigation in lesions of this area of body.

Keywords: Head neck, face lesions, FNAC, Cytohistopathological correlation.

[*]**Address for Correspondence:**
Dr. Nishant Bawankule, 16 Trimurti quarters, JJ Hospital, Byculla, Mumbai-400008, Maharashtra, INDIA.
Email: shubhanish@yahoo.com
Received Date: 24/02/2015 Revised Date: 03/03/2015 Accepted Date: 08/04/2015

Access this article online	
Quick Response Code:	Website: www.statperson.com
	Volume 5 Issue 2

INTRODUCTION

Martin & Ellis (1930) were the first who used fine needle aspiration (FNA) technique for the diagnosis of various lesions. Fine needle aspiration cytology (FNAC), is of particular relevance in the head, neck and face area because of the easy accessibility of target sites and excellent patient compliance due to the minimally invasive nature of the technique.[1]The important aspect of this technique is to avoid the surgeries in situations like non neoplastic, inflammatory and metastatic lesions and also it helps in rationally planning surgery.[1] FNA is useful technique in inaccessible swelling which are unsuitable for excision and wedge removal. High sensitivity, specificity and accuracy of FNA in the diagnosis of head, neck and face lesions is essential to reduce the diagnostic surgical procedure.

The technique of fine needle aspiration cytology in the evaluation of masses in head, neck and face region is simple to perform, saves time, reliable, safe and inexpensive.[2,3] FNA is highly accurate when used in proper clinical setting and supported by appropriate clinical and other diagnostic data. It is a valuable initial diagnostic procedure and is most efficient for follow-up and evaluation of patients who has been previously treated. Stewart's opinion of the technique is valid today as it was in 1933 when he stated, "diagnosis by aspiration is as reliable as the combined intelligence of the clinician and pathologist makes it."

How to cite this article: Nishant Bawankule, Shubhangi Jibhkate. Cytohistopathological correlation of head neck and face lesions. *International Journal of Recent Trends in Science and Technology* April to June 2015; 5(2): 81-86 http://www.statperson.com

AIMS AND OBJECTIVES

1. To discuss the utility of the fine needle aspiration technique in diagnosing various head, neck and face lesions and its usefulness as a preliminary guideline for further management of patients.
2. To evaluate the diagnostic accuracy of fine needle aspiration technique by correlating cytological and histopathological diagnosis.
3. To study the sensitivity and specificity of fine needle aspiration technique in head, neck and face masses.

MATERIAL AND METHODS

This was a prospective study carried over a period of 3 years in which total 710 cases were evaluated. The patients referred to the cytology section from clinical O.P.D. as well as patient admitted in wards with clinical diagnosis of any head, neck and face lesions were included in the study. The fine needle aspirations diagnosis was confirmed by histopathology wherever available.

OBSERVATIONS AND RESULTS

In the present study the overall male to female ratio was 1: 2.2 with the median age of the patients 35 year. It was observed that most common site of origin of head, neck and face lesions were lymph node followed by thyroid lesions.(Table 1)The overall technical success rate was 92.11 % in the present series and the highest being that of lymph nodes (96.35 %) and lowest in miscellaneous category (81.08 %).(Table 2) The non-neoplastic smears were accounted for 64.62 % of lymph node aspirates, 84.25 % of thyroid, 19.23 % of salivary gland and 51.35 % in aspirates from miscellaneous sites.Malignant smears were highest in aspirates from lymph node (31.37%) followed by miscellaneous sites (15.31%). Inadequate smears were highest in miscellaneous group followed by thyroid lesions. Lymph node smears(50.28 %) were major bulk of in which metastatic deposit (26.16 %) was most common .Thyroid lesions comprised of 30.42 % of head, neck and face lesions in which colloid goiter (51.77 %) forms the single largest group. Salivary gland lesions comprised of 26 (03.66 %) with pleomorphic adenoma (43.47 %) as the commonest lesion. In the miscellaneous category (15.63 %) epidermal cyst (45.55 %) was the most common lesion. Out of total 654 cases with adequate cytological smears surgical confirmation of cytological diagnosis was obtained in 116 cases in which there was a single false positive aspirate of thyroid and 3 false negative aspirates- 2 of lymph node and 1 of miscellaneous category. (Table 4) One case was cytologically diagnosed as reactive lymphadenitis but was histopathologically proven as non-hodgkin's lymphoma. One case with cytological diagnosis of tuberculous lymphadenitis was given asmetastatic squamous cell carcinoma histopathologically. A cytologically granulomatous lymphadenitis turned out to be reactive lymphadenitis histopathologically. Two cases were cytologically diagnosed as colloid cyst out of which one case histopathologically proven to be nodular goitre and one as follicular adenoma also one case of follicular neoplasm on cytology turned out to be lymphocytic thyroiditishistopathologically. One case which was negative for malignancy on oral cytology scrape was proved to be assquamous cell carcinoma histopathologically (Table 5)

Table 1: Shows Site wise distribution of in HNF lesions

Sr. No.	SITE	TOTAL CASES	PERCENTAGE
1	Lymph Node	357	50.28 %
2	Thyroid	216	30.42 %
3	Salivary Gland	26	03.66 %
4	Miscellaneous	111	15.63 %
	Total	**710**	**100**

Table 2: Shows technical success rate or percentage of satisfactory samples in present series

Site	Cases where satisfactory or cytodiagnostic samples obtained	Cases where inadequate Samples obtained		Technical success rate
		Number	Percentage	
Lymph Node	344	13	3.64	96.35 %
Thyroid	197	19	8.80	91.20 %
Salivary gland	23	03	11.54	88.46 %
Miscellaneous	90	21	18.92	81.08 %
TOTAL	**654**	**56**	**7.88**	**92.11 %**

Table 3: Shows cytodiagnosis of 710 aspirates

Site	Categories				
	Inadequate (%)	Nonneoplastic (%)	Benign (%)	Suspicious (%)	Malignant (%)
Lymph Node (n = 357)	13 (3.64)	230 (64.42)	0 (00)	2 (0.56)	112 (31.37)
Thyroid (n = 216)	19 (8.80)	182 (84.25)	0 (00)	04 (1.85)	11 (5.09)
Salivary Gland (n = 26)	3 (11.54)	05 (19.23)	15 (57.69)	0 (00)	3 (11.54)
Miscellaneous (n = 111)	21 (18.92)	57 (51.35)	16 (14.41)	0 (00)	17 (15.31)
Total (n = 710)	**56 (7.88)**	**474 (66.76)**	**31 (4.36)**	**06 (0.84)**	**143 (20.14)**

Table 4: Shows histopathological correlation of cytodiagnosis

Cytodignosis category	Total cases	No of Biopsy	H/P Proved		False +	False -
			Non neoplastic & Benign	Malignant		
Lymph Node	344	47	22	25	00	02
Thyroid	197	18	15	03	01	00
Salivary Gland	23	06	04	02	00	00
Miscellaneous	90	45	33	12	00	01
TOTAL	**654**	**116**	**74**	**42**	**01**	**03**

Table 5: Shows histopathological correlation of cytodiagnosis

No	Cytological Δ	No. of cases	Histopathological Diagnosis		
			Biopsy	Consistent	Inconsistent
	Reactive LN	77	11	10	1 NHL
	TuberculousLN	60	05	04	1 SCC
	Granulomatous LN	84	07	06	1 Reactive
	Cysticercosis	01	01	01	0
	LN Suspicious of malignancy	01	01	1 NHL	0
	NHL	09	07	07	0
	MetastaticLN	70	15	15	0
	Hashimoto's Thyroiditis	26	06	06	0
	Colloid Goire	103	05	05 Nodular goitre	0
	Colloid Cyst	26	03	03 Nodular goitre Follicular adenoma	0
	Thyroid Suspicious of Malignancy	04	02	Papillary Ca	0
	Follicular carcinoma	02	02	1 Follicular Carcinoma	1 lymphocytic Thyroiditis
	Plemorphic Adenoma	10	03	03	00
	Warthin's Tumor	04	01	01	00
	MucoepidermoidCa	02	01	01	00
	Adenoid Cystic Ca	01	01	01	00
	Oral Cavity Scrape Negative for malignancy	09	01	00	01SCC
	Oral Cavity Scrape Positive for malignancy(SCC)	15	10	10	00
	Basal Cell Ca	01	01	01	00
	Schwanomma	01	01	01	00
	Lipoma	07	06	06	00
	Epidermoid cyst	41	25	25	00
	Paraganglioma	03	01	01	00
	TOTAL	**654**	**116**	**110**	**05**

Table 6: Shows comparison of diagnostic accuracy with similar studies

STUDY	YEAR	ACCURACY
Guyot et al[9]	1990	80.00 %
Oyafuso et al[10]	1992	95.60 %
Kumarsinghe et al[11]	1996	94.00 %
Bardales et al [12]	2001	84.00 %
Abrari A et al[1]	2002	93.00 %
Mahbod G et al[13]	2002	92.70 %
Amatya B et al[14]	2009	93.00 %
Fernandes et al[15]	2009	96.70 %
Tatomirovic et al[16]	2009	91.89 %
Present study	2010	96.66 %

Table 7: Shows comparison of results of present series with other studies in head, neck and face aspiration cytology

Studies	No of Aspirations	Sensitivit %	Specificit %	Positive Predictive Value %	Negative Predictive Value %
1) Schwarz et al (1990)[19]	182	92.00	100	100	89.00
2) Flynn et al(1990)[20]	203	82.00	99.00	98.00	88.00
3) Schelkun et al (1991)[21]	213	81.10	99.00	98.90	82.80
4) Mobley et al (1991)[22]	89	94.40	97.00	_	_
5) Oyafuso et al (1992[10]	273	93.50	98.70	99.00	91.50
6) Cheng et al (1992)[23]	187	81.00	89.00	91.00	78.00
7) Abrari et al (2002)[1]	150	95.00	_	_	_
8) Bardales et al (2001)[12]	98	86.00	93.00	96.00	_
9) Mahbod G et al (2002)[13]	55	81.20	97.40	92.80	_
10) Amatya Bet al (2009)[14]	1229	77.00	98.00	91.00	93.00
11) Fernandes et al (2009)[13]	120	87.50	100	_	_
12) Tatomirovic et al (2009)[16]	494	91.50	92.85	97.00	81.25
13) Present study (2010)	710	93.18	98.66	97.67	95.94

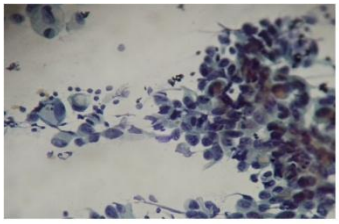
Figure 1

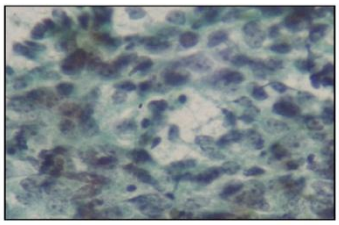
Figure 2

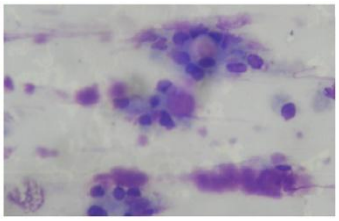
Figure 3

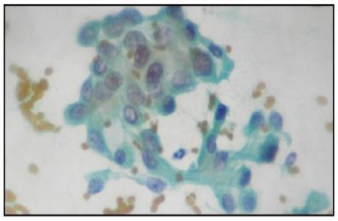
Figure 4

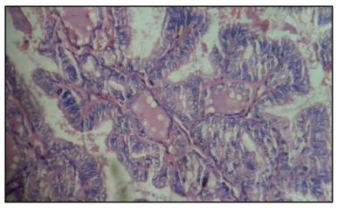
Figure 5

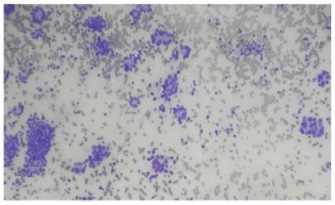
Figure 6

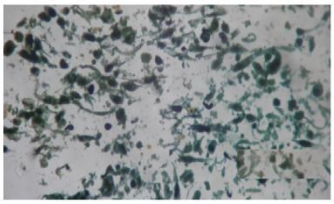
Figure 7

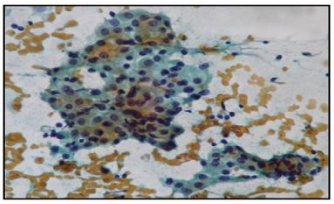
Figure 8

Figure 1: Cytology Cysticercosis –membrane (PAP, 40X)
Figure 2: Metastatic mucinous adenocarcinoma- showing signet ring apperance (PAP, x40).
Figure 3: Metastasis of nasopharyngeal carcinoma-Cells in cluster with large vesicular nuclei along with pale fragile cytoplasm admixed with background lymphocytes(PAP, x40).
Figure 4: Metastatic medullary Carcinoma-mixture of single and clustered polygonal cells and spindle tumor along with Irregular fragments of amyloid material(MGG, x40).
Figure 5: Papillary carcinoma thyroid- Syncytial aggregate with intranuclear cytoplasmic inclusion(PAP, x40).
Figure 6: Tissue section- Papillary carcinomas thyroid (H&E,x40).
Figure 7: Follicular neoplasm – showing repetitive follicles with nuclear crowding and overlapping (MGG, x10).
Figure 8: Anaplastic carcinoma thyroid –Bizzare ,large ,spindle cells with nuclear pleomorphism with scant ill defined cytoplasm.(PAP, x40).

DISCUSSION

In the present study out of total 710 aspirates 474 (66.76%) were non neoplastic, 31 (4.36 %) were benign, 6 (0.84%) were suspicious for malignancy and 143 (20.14%) were malignant and 56 (7.88 %) were inadequate for interpretation.(Table:3) Out of 654 adequate smears, histopathological diagnosis was available in only 116 cases. This was due to most of the non-neoplastic and inflammatory lesions were directly treated medically after cytodiagnosis. The other major category was metastatic lesions which were referred for other modality of the treatment in the form of chemotherapy and radiotherapy.

Diagnostic Accuracy

Out of 74 histopathologically confirmed benign lesions, in 73 cases cytological diagnosis was consistent with histopathological diagnosis giving diagnostic accuracy for benign lesions as 98.64%. In 1 case cytological diagnosis was malignant but histopathological diagnosis was benign giving a false positive diagnosis. Out of 41 histopathologically confirmed malignant lesions, 38 cases were cytologically diagnosed as malignant giving diagnostic accuracy for malignancy as 92.68 %. The

remaining 3 cases were diagnosed as benign lesions on cytology but on histopathology diagnosis were malignant, thus giving false negative diagnosis. Out of 116 histopathologically confirmed cases, concordance between cytologic and histopathologic diagnosis was found in 45 (95.74%) aspirates of 47 lymph node lesions, 17 (94.44%) out of 18 thyroid lesions, 6 (100 %) out of 6 salivary gland lesions and 44 (97.77 %) out of 45 miscellaneous lesions. (Table 5) In total 116 histopathologically confirmed cases, 112 cases were correctly diagnosed on FNAC giving overall diagnostic accuracy of 96.66 %. It is favorably comparable with findings of other workers.(Table 6)

Diagnostic Pitfalls

False positive: False positive i.e. a cytological conclusion of malignancy in a lesion but histopathologically benign character is found. In the present study cytologically 1 case was diagnosed as follicular neoplasm but on histology it was proved to be goiter with focal lymphocytic thyroiditis. In this case there was increased cellularity and some cells were arranged in acinar and microfollicular pattern and nuclear atypia was seen. Hashimoto's thyroiditis [17] and colloid nodule[18] were known to result in false positive diagnosis.

False negative: False negative i.e. cases of histopathologically proven malignancy reported as benign nature on cytology are to be found. In the present study false negative diagnosis was encountered in 3 cases. 2 were from lymph node and 1 was from miscellaneous category. Out of 2 false negative cases from lymph node, 1 was cytologically diagnosed as tuberculous lymphadenitis and 1 as reactive lymphadenopathy.

Tuberculous lymphadenitis was histologically proven as secondary deposits of squamous cell carcinoma. In this case there was a presence of pink necrotic material which obscured the cellular details also there was presence of granulomatous reaction which is also seen along with squamous cell carcinoma. Reactive lymphadenitis was histologically proved to be non-hodgkin's lymphoma. This was due to failure of representative sampling from the involved lymph node. One false negative case was reported from miscellaneous category. It was scrape from oral cavity mass which was negative for malignancy on cytology was given as squamous cell carcinoma. This was due to inflammatory and superficial squamous cells were predominant in the smear which obscured malignant cells. Sensitivity, specificity, positive predictive value and negative predictive value in present series were 93.18%, 98.66%, 97.67% and 95.94% respectivelywhich are favorably comparable with the findings of other studies. (table 7)

CONCLUSION

Fine needle aspiration cytology is a safe and reliable technique in evaluation of head, neck and face lesions. A standardized collection and processing method minimizes the number of unsatisfactory smears. Fine needle aspiration is quick, easy and cost effective office procedure and is suitable for the first line investigation in lesions of this area of body. A competent and experienced cytopathologist is essential for the success of FNA cytology. Close collaboration between surgeon and cytopathologist will result in effective use of this technique in the management of patients presenting with lesions in head and neck region.

REFERENCES

1. Abrari A, Ahmad S, Bakshi V. Cytology in the otorhinolaryngologist's domain - a study of 150 cases, emphasizing diagnostic utility and pitfalls.Ind J Otolaryngol Head Neck Surg 2002;54(2):107-10.
2. Carrol CM, Nazeer U, Timon CL. The accuracy of Fine needle aspiration biopsy in the diagnosis of head and neck masses. Ir J Med sci 1998 Ju1 –Sep; 167(3):149-51.
3. Wilson JA, McIntyre MA, Haacke P. Fine needle aspiration biopsy and the otolaryngologist. J LaryngolOtol 1987;101(6):595-600.
4. Frable WJ. Thin needle aspiration biopsy. Am Jr of Clin Path 1976; 65: 168-81.
5. Philippe Vielh. Techniques of FNA cytology. In: Orell SR, Sterrett GF, Whitaker D, editor. Fine needle aspiration cytology. 4th ed. Churchill Livingstone; 2005. p. 9-30.
6. Santos JEC, Leiman G. Non-aspiration fine needlecytology. ActaCyto 1988; 32:353-6.
7. Frable WJ. Fine needle aspiration biopsy techniques. In: Bibbo M, editor.Comprehensive cytopathology. 2nd ed. Saunders Company; 1997. p.631.
8. Gershengorn MC, Mcclung MR. Fine needle aspiration cytology in the preoperative diagnosis of thyroid nodules. Ann Int Med 1997; 87:265-9.
9. Guyot JP, Obradovic D, Krayenbuhl M, Zbaeren P, Lehmann W. Fine needle aspiration in the diagnosis of head and neck growth:Is it necessary? Otolaryngol Head Neck Surg 1990; 103:697-700.
10. Oyafuso MS, Longatto FA, Ikeda MK. The role of Fine needle aspiration cytology in the diagnosis of the head and neck excluding the thyroid and salivary glands. Tumori 1992;78(2):134-6.
11. Kumarasinghe P. An analysis of 5194 Fine needle aspiration biopsy samples. Ceylon Med J 1996; 41(2):57-60.
12. Bardales RH, Baker SJ, Mukunyadzi P. Fine needle aspiration cytology findings in 214 cases of nonparotid lesion of the head. Diagncytopathol 2000 Apr;22(4):211-7.
13. Mahbod G, KoasriF ,Tafreshi MA. Fine needle aspiration cytology in diagnosis of nonthyroidal neck masses. ActaMedicaIranica 2002; 40(1):50.
14. Amatya BB, Joshi AR, Singh SK, Panth R, Basnet RB. A study of fine needle aspiration cytology of head and neck

masses and their corroboration by histopathology. PMJN 2009; 8(2).
15. Fernandes H, D'souza CRS, ThejaswiniBN.The role of fine needle aspiration cytology in palpable head and neck masses. Journal of Clinical and Diagnostic Research 2009 October; 1719-25.
16. Tatomirovic Z, SkuleticV,Bokun R, Trimcev J, Radic O, Cerovic S, et al. Fine needle aspiration cytology in the diagnosis of head and neck masses: accuracy and diagnostic problems. JBUON 2009 Octo –dec; 14(4):653-9.
17. Gharib H. Fine needle aspiration biopsy of thyroid gland. Thyroid disease manager. [Serial Online] 2010 [cited 2008 Feb]; Available from: URL:(http/www.thyroidmanager.org). Walfish PG, Hazani E, Strawbridge HT. A prospective study of combined ultrasonography and needle aspiration biopsy in the assessment of hypofunctioning thyroid nodule. Surg 1977;82(4): 474-82.e
18. Schwarz R, Norman HC, Macforlane JK. Fine needle aspiration cytology in evaluation of Head and neck masses. Am Jr of Surg 1990; 159:482-5.
19. Flynn MB, Wolfson SE, Thomas S, Kuhns JG. Fine needle aspiration biopsy in clinical management of head and neck tumours. Jr of Surgical Oncology 1990; 44:214-7.
20. Schelkum PM, Grunddy WG. Fine needle aspiration biopsy of head and neck lesions. Jr Oral MaxillofacSurg 1991; 49 (3):462-7.
21. Mobley DL, Wakely PE, Frable MA. Fine needle aspiration biopsy: application to Pediatric head and neck masses. Laryngoscope 1991; 101(5)469-72.
22. Cheng AT, Dorman B. Fine needle aspiration cytology:The Auckland Experience. Aust N Z J Surg 1992; 62(5):368-72.

Source of Support: None Declared
Conflict of Interest: None Declared