ORIGINAL ARTICLE

FINE NEEDLE ASPIRATION CYTOLOGY IN NON-THYROIDAL HEAD AND NECK MASSES-A DESCRIPTIVE STUDY IN TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Fine needle aspiration cytology (FNAC) of broad and highly sensitive head and neck region is particularly suitable for confirming non-neoplastic and metastatic lesions as it can prevent a surgical process and anaesthetic conditions and can provide a suitable guidance for conservative management.

Aim and objective: To access the role of FNAC in diagnosing various head and neck swellings.

Material and methods: This retrospective study was done in a tertiary care hospital from 1/1/2012 to 31/12/2012 in patients having swelling in head and neck region. Total 701 cases were evaluated in the cytopathology section and aspiration was done using 10ml syringe and 22-23 gauge needles.

Results: Cytodiagnostic yield was 90% while in only 10% cases, no diagnosis was given. Lymph node lesions were most common with granulomatous/ tuberculous lesions being the commonest variety. In salivary gland lesions, neoplastic lesions (benign: Pleomorphic adenoma) were commonest. Other common lesions were squamous cell carcinomas and lipomas as common malignant and benign tumours respectively.

Conclusion: FNAC provides a reliable, cost effective, convenient, easily accessible and non-traumatic method as the best initial work up and management of swellings of sensitive head and neck region.

Key words: Fine needle aspiration, Head and neck region, Lymph node, Salivary Gland, Tuberculosis

INTRODUCTION

Fine Needle Aspiration (FNA) technique was first introduced by Martin & Ellis (1930) in diagnosis of various organs lesions.[1] Virtually any superficial organ or tissue can be sampled through this procedure. Easily targeted organs include thyroid, breast, or lymph nodes. Whereas deep organs like lungs, liver, kidney, mediastinum, and retroperitoneum are aspirated with the guidance of ultrasound or computed tomography, swellings in head and neck region can arise from various structures like, lymph node, salivary gland, thyroid, soft tissues, vessels and nerves and being easily accessible, the swellings can be aspirated without difficulty. FNAC is now a prerequisite for various neck swellings as the procedure is non-traumatic, easily accessible, inexpensive, excellent compliance and avoids the anaesthetic complications and requirement of open surgical biopsy. [2, 3] FNAC has been found to be highly accurate in head and neck region in various studies. [5-9] FNAC can easily differentiate non neoplastic conditions from neoplastic conditions thus eliminating the need for surgical intervention in those cases which can be managed conservatively and also guide clinicians for the next best step in work up. The objective of our study is to find the spectrum of non-neoplastic and neoplastic lesions in this wide and sensitive area.

MATERIAL AND METHODS

The target population of this retrospective study was the patients that presented as head and neck masses in a tertiary care hospital in southern Gujarat from 1/1/2012 till 31/12/2012. The aspiration was performed by using 10 ml syringe and 22-23 gauge needle. After convincing the patient and taking written and informed consent for the procedure, detailed clinical history was taken and the area of interest was properly exposed. The mass was first cleaned using betadine and spirit, fixed between index finger and thumb and then needle was introduced. To and fro motion was performed along with continuous negative pressure. After that the pressure was released and needle was withdrawn. In cases of failed process and residual tumours, repeat aspirations were performed. For cystic lesions, cyst content was aspirated and smears were prepared after cytocentrifugation. Air dried smears were stained with Giemsa stain and smears fixed in 95% alcohol were stained with Papanicolaou and haematoxylin and eosin.

RESULTS

Out of 2345 fine needle aspirations done in our tertiary care institute, total 701(30%) cases were of head and neck region comprising almost one third of all. Total 631(90%) aspirations were satisfactory while in 70(10%) aspirations only descriptive report was given. In satisfactory smears, maximum numbers of cases (374) (53.50%) were of lymph node region, 32(4.50%) of salivary gland and 225(32.00%) cases were of other sites including neck, maxillary region and scalp. Results are depicted in following tables (table 1, 2 & 3).

Table 1: Spectrum of lesions in lymph node

Lymph-node	Cases (N=374) (53.50%)
Granulomatous/Tuberculosis	250(67)
Chronic Reactive Hyperplasia	79(21)
Metastasis	29(8)
Lymphoid Neoplasm	8(2)
Acute Lymphadenitis	5(1.3)
Hodgkin's Lymphoma	2(0.5)
Multiple Myeloma	1(0.2)

Table 2: Spectrum of lesions in salivary glands

Salivary Gland	Cases (N=32) (4.50%)
Non neoplastic conditions	
Sialadenosis	6(19)
Sialadenitis	5(16)
Mucous retention cyst	2(6)
Cystic lesion	1(3)
Neoplastic conditions	
Pleomorphic Adenoma	11(35)
Adenoid cystic carcinoma	2(6)
Acinic cell carcinoma	2(6)
Low Grade mucoepidermoid carcinoma	1(3)
Adenocarcinoma*	1(3)
Salivary gland neoplasm	1(3)

*Adenocarcinoma at angle of mouth (minor salivary gland)

Table 3: Spectrum of other lesions in head and neck region

Other lesions	Cases (N=225) (32.00%)
Non neoplastic conditions	
Epidermal cysts	52(24)
Abscess	16(7)
Cystic Lesion	11(5)
Brachial cysts	2(0.8)
Recurrent non-neoplastic lesion	2(0.8)
Benign conditions	
Lipomas	28(12.4)
Soft tissue lesion	2(0.8)
Carotid body tumour	1(0.4)
Benign skin adnexal tumour	2(0.8)
Benign tumour of neural origin	1(0.4)
Infantile fibromatosis coli	1(0.4)
Malignant conditions	
Squamous cell carcinomas	93(41)
Poorly differentiated carcinomas	11(5)
Plasmacytoma	1(0.4)
Malignant round cell tumour	1(0.4)
Undifferentiated	1(0.4)

#Figures in bracket indicate percentage

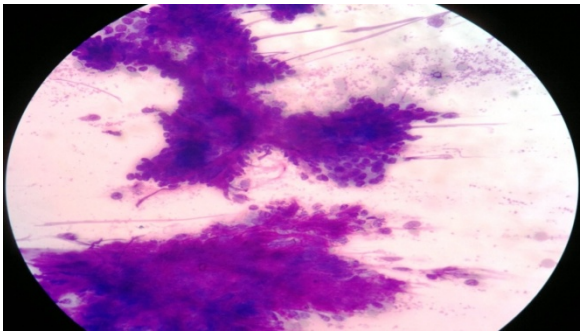

Figure 1: Salivary gland swelling, Pleomorphic Adenoma Poorly cohesive epithelial cells with fibrillar chondro-myxoid stroma staining brightly magenta (MGG X10)

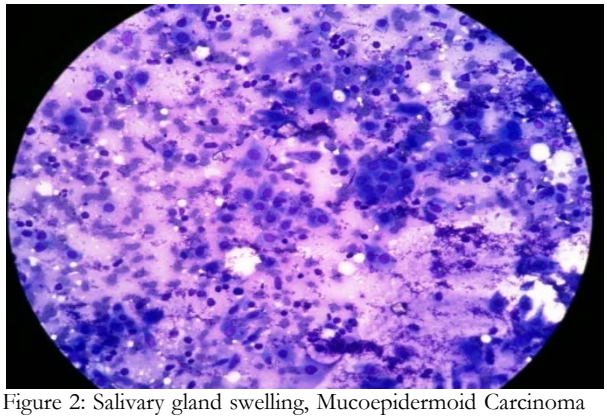

Figure 2: Salivary gland swelling, Mucoepidermoid Carcinoma Cell Clusters probably of intermediate cells in dirty appearing mucus, debris, inflammatory cells % macrophages (MGG,x10)

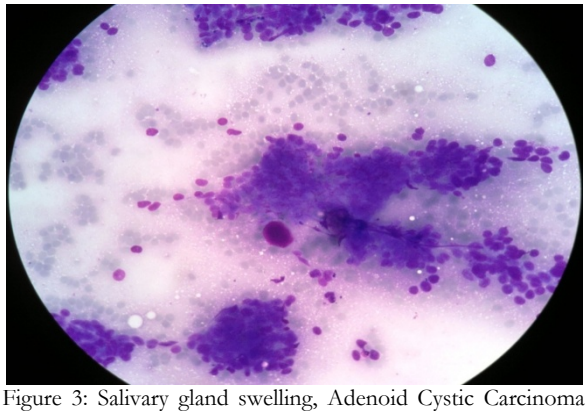

Figure 3: Salivary gland swelling, Adenoid Cystic Carcinoma Cells in finger-like or beaded fragments with hyaline stromal globules (MGG, X10)

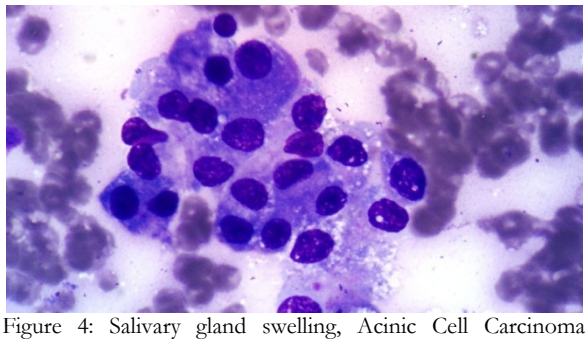

Figure 4: Salivary gland swelling, Acinic Cell Carcinoma Abundant, fragile, finely vacuolated, occasionally dense oncocyte-like cytoplasm and rounded, medium sized nuclei, mild to moderate anisokaryosis, bland chromatin. (MGG,X40)

DISCUSSION

Fine Needle Aspiration Cytology is a procedure where by small amount of tissue or cells are aspirated from a pathological lesion with the help of 10ml disposable syringe attached to 22 or 23 gauge needle. The procedure also provides the information about the next best step in clinical workup of patients. This procedure can easily distinguish between non-neoplastic and neoplastic conditions and can diagnose conditions like tuberculosis and reactive lymph node from malignant and metastasis thus preventing unnecessary surgery. [3, 4] Also, this is a procedure which can easily be performed at peripheral health care center where facilities for histopathology is not available. The reliability of the method has been shown in several studies for neck masses. [5-10]

A well trained experienced individual can easily perform the procedure and offers high degree of reliability and feasibility, therefore FNAC has gained universal acceptance as in most instances it is inexpensive, safe, quick and accurate. The spectrum of lesion observed in our study from the various regions in head and neck confirms its importance as an effective tool in the diagnostic

Work up of this area. Various factors affect the accuracy of cytological diagnosis including the experience of aspirator, sampling method, the adequacy of sample the target organ and the expertise of examiner (Cytotechnologist and

cytopathologist). The false positive diagnosis is rarely made by experienced and well trained individuals. The cytologist may make a certain false negative diagnosis. The false negative and false positives are pointers towards

limitations and pitfalls in cytological interpretation of the material.

The cyto-diagnostic yield was 90% and in 10% of cases no diagnosis could be made because either the material was unsatisfactory due to very small size of swelling or not representative of the concerned area. Such high diagnostic yield was found in other studies also. [11, 12] The normal range for non-diagnostic smears in lymphoid lesions is less than 10-15%. [13]

The spectrum of lymph node lesions in this study showed maximum cases of granulomatous/tuberculous lesions, which were 250 cases. (Table 1) This may be due to higher incidence of tuberculosis in our area. This was very similar to the result of study on western population by Lawrence and the Indian study by Gupta et al. [14, 15] There were some cases labelled as lymphoid neoplasms. The reason for not giving a confirmatory diagnosis was the definite need of biopsy evaluations along with marker studies for exact characterization of lymphoma, Therefore, an excision biopsy was advised for confirmative diagnosis. It could be useful to have additional smear for Giemsa staining. We can get benefit of ancillary methods such as immunocytochemistry in aspiration smears. This can help us optimize the accuracy of the method. Squamous cell carcinomas were most common metastatic lymph node lesions followed by adenocarcinomas and small cell carcinoma. In southern Gujarat, squamous cell carcinomas of upper aerodigestive tract are most common due to consumption of tobacco in its various forms. The Salivary Gland lesions were the least within a total of 32 cases showing 45% non-neoplastic, 35% benign and 20% of malignant lesions, depicting the common occurrence of benign lesions at this site as compared to malignant pathology. In other head and neck lesions, non-neoplastic conditions were 37% with epidermal cysts as commonest lesion while neoplastic conditions were 63%. Lipomas constituted as most common benign tumours followed by other benign soft tissue lesions. Squamous cell carcinomas were the commonest malignant tumours of neck region.

CONCLUSION

In spite of the limitations and pitfalls, FNAC provides a reliable, cost effective, convenient, easily accessible, non-traumatic and highly accurate method as the best initial work up and management of swellings of head and neck region. Although, the benign results should be interpreted in the context of clinical, radiological and other data but if clinical malignancy is highly suspected, further evaluation in the form of excisional biopsies is justified.

Limitations and Pitfalls

False positive aspirations may be due to regenerative changes, metaplasia and various other factors while false negative aspirations may be due to wrong technique, cystic areas, haemorrhage, and necrosis containing no viable diagnostic cells, small foci of neoplastic lesion nearby large reactive non-neoplastic mass and fibrotic lesions.

REFERENCES

1. Martin HE, Ellis EB: Biopsy by needle puncture and aspiration; Ann surg,1930;92,69.
2. Abrari A, Ahmad S S, Bakshi V. Cytology in the otolaryngologist's domain- a study of 150 cases, emphasizing diagnostic utility and pitfalls. Indian J Otolaryngol Head Neck Surg 2002; 54(2):107-10.
3. Murthy P, Laing MR, Palmer TJ. Fine needle aspiration cytology of head and neck lesions: an early experience. J R Coll Edinb 1997;42:341–346.
4. Tandon S, Shahab R, Benton JI, Ghosh SK, Sheard J, Jones TM: Fine needle aspiration cytology in regional Head and Neck Cancer Center. Comparision with a systemic review & metaanalysis. Head Neck 2008;30(9),1246-52
5. Carroll CM, Nazeer U, Timon CI. The accuracy of fine-needle aspiration biopsy in the diagnosis of head andneck masses. Ir J Med Sci1998;167(3):149-51
6. Bardales RH, Baker SJ, Mukunyadzi P. Fine-needle aspiration cytology findings in 214 cases of nonparotid lesions of the head. Diagn Cytopathol 2000;22(4):211-7.
7. Fulciniti F, Califano L, Zupi A, Vetrani A. Accuracy of fine needle aspiration biopsy in head and neck tumors. J Oral Maxillofac Surg 1997;55(10):1094-

8. Mahbod G, Koasri F, Alavi Tafreshi M. fine needle aspiration cytology in diagnosis of nonthyroidal neck masses. Acta medica Iranica 2002;40(1):49-51

9. Comeche C, Barona R, Navarro T, Armengot M, Basterra J. Verifiable diagnosis of the puncture of the fine needle aspiration in head and neck neoplasms. Acta Otorrinolaringol Esp 1993;44(5):381-4.

10. Mixon T, Gianoli G. Fine needle aspiration in Head and Neck Surgery; J La State Med Soc 1993;145(12) ;505-8

11. Schelkun PM and Grundy WG. Fine-needle aspiration biopsy of head and neck lesions. *J Oral Maxillofac Surg* 1991; 49: 262-67.

12. Mahbod G, Koasri F, Tafreshi MA. Fine needle aspiration cytology in diagnosis of non-thyroidal neck masses. *Acta Medica Iranica* 2002; 40(1):49-51.

13. Guidelines of the Papanicolaou Society of Cytopathology for fine-needle aspiration procedure and reporting. The Papanicolaou Society of Cytopathology Task Force on Standards of Practice. Diagn Cytopathol 1997;17(4):239-

14. Gupta, RK. Naran, S., Lallu, S. and Fauck, R. 2003. The diagnostic value of fine needle aspiration cytology (FNAC) in the assessment of palpable supraclavicular lymph nodes- a study of 218 cases. Cytopathology, 8: 511- 4.

15. Lawrence, C., Imad, AH. and Shara, NMNM. 2003. Study of Fine Needle Aspiration of head and neck masses Acta Cytol, 47:387-92.