

Diagnostic Utility of FNAC and Pathological Profile of Head and Neck Lesions

Nazar Muhammad Afridi¹, Mohammad Umar Shah², Syed Irfan Raza Arif³, Muhammad Usman Anjum⁴ and Arshad Wahab Shah⁵

ABSTRACT

Objective: To study the diagnostic yield of FNAC when compared with histopathology and to determine the pathological spectrum of head and neck lesions in our region.

Study Design: Cross-sectional study

Place and Duration of study: This study was conducted at the Department of Pathology, Frontier Medical & Dental College, Abbottabad from January 2016 to April 2017,

Materials and Methods: A total of 150 patients with superficial and palpable head & neck swelling underwent fine needle aspiration and cytology using standard protocol.

Results: Out of 150 patients, there were 84 males and 66 females with male to female ratio of 1.27:1. Mean age was 35±17.42 years. Most of the patients, 77.33%, were between the ages of 21-60 years. As per the site of involvement, most of the lesions, 40%, occurred in lymph nodes followed by salivary glands, 30% cases, and cystic, soft and other tissues, 30% cases. The most common benign lesion involving lymph nodes was tuberculosis while most common malignant lesion involving lymph nodes was metastatic deposits to lymph nodes. In case of salivary glands, the most common benign lesion was pleomorphic adenoma while most common malignant lesion was mucoepidermoid carcinoma. Among benign lesions, lipoma was observed in majority of cases involving cystic, soft and other tissues while among malignant lesions, metastatic squamous cell carcinoma was most common. When compared to histopathology, the overall sensitivity and specificity of FNAC was 73% and 93% in the diagnosis of head and neck lesions. In case of salivary gland lesions, sensitivity and specificity of FNAC was 65% and 89% while it was 72% and 95% in case of lymph node lesions and 84% and 100% respectively in case of cystic, soft tissue and other tissue lesions.

Conclusion: Head and neck region encompasses a diversified range of diseases ranging from inflammatory to malignant ones. Accurate diagnosis of these lesions is very important for their successful treatment. FNAC is a safe, reliable, convenient and minimally invasive procedure which can be done on out-patient basis. It provides accurate information in most cases which in turn helps in making treatment decisions as it ascertains the type of lesion.

Key Words: Salivary gland, Head and neck, FNAC

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INTRODUCTION

Head and neck lesions are quite common in clinical practice. These lesions include both benign and malignant conditions. Benign conditions include infections, reactive lymph node hyperplasia, etc while malignant lesions could be primary and secondary.¹ Primary malignant lesions are the ones which develop primarily in this area while secondary malignant lesions

are the ones which usually metastasize to this area. Malignant head and neck lesions are rated 10th most common cancers globally.² Definitive management of these lesions depends upon accurate diagnosis of these lesions. Diagnosis is usually made on clinical grounds and confirmed through laboratory investigations. Most appropriate laboratory investigation for such lesion should be the one which is cost-effective, easy to perform, can be done on out-patient basis and minimally invasive. Fine needle aspiration and cytology (FNAC) is one of such laboratory investigations which fulfill these criteria. It is simple, yet cheap, can be done on out-patient basis and minimally invasive.^{3, 4} It provides an additional advantage as to avoid surgery in inflammatory and non-malignant lesions.¹ FNAC is specifically important in clinical settings where facilities or expertise for histopathological examination are either not available or lacking.⁵

We have conducted this clinical study to determine the pathological profile of head and neck lesions as well as

¹. Department of ENT / Prosthodontics² / Anatomy³ / Pathology⁴ / Community Medicine⁵, Frontier Medical & Dental College, Abbottabad.

Correspondence: Dr. Muhammad Usman Anjum, Assistant Professor, Department of Pathology, Frontier Medical & Dental College, Abbottabad, Pakistan
Contact No: 0335-5112339
Email: usmanziyai@gmail.com

determine the diagnostic yield of FNAC when compared with histopathology.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Department of Pathology, Frontier Medical & Dental College, Abbottabad, from January 2016 to April 2017. This was a convenience non-probability sampling. All those patients who had a superficial and clinically palpable swelling in head and neck area, of both genders and all ages were included in the study. Patients with thyroid lesions, or those with history of bleeding disorders, or who had been diagnosed with a malignancy in head and neck region or those who were unwilling for FNAC and biopsy were excluded from the study. Informed consent was taken. A structured performa was used to record history, especially related to the swelling and history of tuberculosis in family, systemic and local examination findings. FNAC was done using 22 to 23 gauge needle attached to a 10 ml syringe under strict aseptic conditions. The material was aspirated under negative pressure and then smeared on at least two slides which were later air-dried or wet fixed and then, stained with Giemsa and Papanicolaou stains. Zeihl Neelsen stain was used when tuberculosis was suspected or lymph node aspirate was purulent or cheesy. Biopsy specimens from these patients for histopathological examination were processed after fixing them in 10% formalin. They were stained using Haematoxylin and Eosin stain. Special stains were used as and when required. Data was recorded, managed and analyzed using Statistical package for social sciences (SPSS, version 21).

RESULTS

There were 150 patients in this study. There were 84, (56%) males and 66, (44%) females with male to female ratio of 1.27:1. Mean age was 35 ± 17.42 years. Age-wise stratification of study population is given in Table 1. Most of the patients, 77.33%, were between the ages of 21-60 years, showing higher predilection for this age group.

Table No.1. Age-wise stratification of study group, (n=150)

Age group	Number	Percentage
Less than 20 years	24	16%
21 – 40 years	68	45.33%
41 – 60 years	48	32%
> 60 years	10	6.67%
Total	150	100%

As per the site of involvement, most of the lesions, 40%, occurred in lymph nodes followed by salivary glands, 30% cases, and cystic, soft and other tissues, 30% cases, as shown in Table 2.

The most common benign lesion involving lymph nodes was tuberculosis, (29 cases), while most common malignant lesion was metastatic deposits in lymph nodes, (16 cases), followed by Hodgkin and non-Hodgkin lymphoma in 08 and 04 cases respectively.

Table No.2: Stratification of cases according to their site and malignant potential, (n=150)

Site	Malignant Lesions (n, %age)	Non malignant lesions (n, %age)	No, %age
Lymph node lesions	28, 18.67%	32, 21.33%	60, 40%
Cystic, soft and other tissue lesions	14, 9.33%	31, 20.67%	45, 30%
Salivary gland lesions	15, 10%	30, 20%	45, 30%
Total	57, 38%	93, 62%	150, 100%

Table No.3: Stratification of head and neck lesions, (n=150)

Non-malignant lesions	Number, (%age)	Malignant lesions	Number, (%age)
Lymph node			
Tuberculosis	29, (19.33%)	Metastatic deposits	16, (10.66%)
Reactive hyperplasia	03, (2%)	Hodgkin's lymphoma	08, (5.33%)
		Non-Hodgkin's lymphoma	04, (2.66%)
Salivary gland			
Pleomorphic adenoma	25, (16.66%)	Mucoepidermoid carcinoma	09, (6%)
Sialadenitis	05, (3.33%)	Squamous cell carcinoma	03, (2%)
		Acinic cell carcinoma	03, (2%)
Cystic, soft and other tissues			
Lipoma	12, (8%)	Metastatic squamous cell carcinoma	12, (8%)
Epidermal cyst	09, (6%)	Small round cell tumor	02, (1.33%)
Schwannoma	05, (3.33%)		
Cystic hygroma	03, (2%)		
Thyroglossal cyst	01, (0.66%)		
Hemangioma	01, (0.66%)		

In case of salivary glands, the most common benign lesion was pleomorphic adenoma, (25 cases), while most common malignant lesion was mucoepidermoid carcinoma, (09 cases). Similarly, among cystic, soft and other tissues lesions, the most common benign lesion was lipoma, (12 cases), while most common malignant lesion was metastatic squamous cell carcinoma, (12 cases), as shown in Table 3.

When compared to histopathology, the overall sensitivity and specificity of FNAC was 73% and 93% in the diagnosis of head and neck lesions. In case of salivary gland lesions, sensitivity and specificity of FNAC was 65% and 89% while it was 72% and 95% in case of lymph node lesions and it was 84% and 100% respectively in case of cystic, soft tissue and other tissue lesions.

DISCUSSION

There are wide variety of lesions in head and neck region associated with anatomical structures present in this region i.e. lymph nodes, thyroid, salivary glands, etc. These lesions range from inflammatory to malignant ones.⁶ Careful and accurate diagnosis of these lesions is pivotal in their treatment.

Out of 150 cases in our study, there were 56% males and 44% females. In their study which was conducted in Nepal, Pathak et al have reported the same. There were 55.5% males and 44.5% females.³ Similarly, Sharma et al have also reported male preponderance in their Indian subjects where 57.93% of their study subjects were male and 42.07% were female.² Majority of patients, 77.33%, in our study were between the ages of 21-60 years. Similarly, as reported by Rathore et al, majority of their Indian patients were between second and sixth decade of life.⁵ As per the site of involvement, most of the lesions in our study, 40%, occurred in lymph nodes followed by salivary glands and cystic, soft and other tissues with 30% cases in each group respectively. This finding corroborated with other studies. Pathak et al have reported that lymph nodes followed by soft tissue and salivary glands were primarily involved in their Nepalese subjects.³ Likewise, in another study conducted by Rajbhandari et al in Nepal, lymph nodes were predominantly involved in 45% of cases.⁷ Singal et al conducted their study in India. The major site of involvement in their study was lymph nodes which were involved in 48.09% of cases.⁸ Similarly, in another study conducted in India by Kate et al, lymph nodes were involved in 51.5% of cases.⁶

In our study, the most common benign lesion involving lymph nodes was tuberculosis, (29 cases, 19.33%), while most common malignant lesion found was metastatic deposits in lymph nodes, (16 cases, 10.66%). Similar to our study, a study conducted in Peshawar, Pakistan, by Ahmad et al have shown that the most common benign and malignant lesions involving lymph nodes were tuberculous lymphadenitis and metastasis to

lymph nodes respectively.⁹ Correspondingly, Rathore et al have found out that tuberculosis was the main etiological agent of lymph node swelling while metastatic squamous cell carcinoma was the commonest malignant lesion involving lymph nodes.⁵ Likewise, Kate et al have also reported the same with tuberculous lymphadenitis being the commonest benign lesion and metastasis being the commonest malignant lesion involving lymph nodes.⁶ Sharma et al have also reported that the most common lesion affecting lymph nodes was tuberculosis.² Similarly, in another Indian study conducted by Khetrpal et al, tuberculosis was reported to be the major cause involving lymph nodes in 23.3% cases.¹

In case of salivary glands, the commonest benign lesion was pleomorphic adenoma followed by sialadenitis while commonest malignant lesion involving lymph nodes was mucoepidermoid carcinoma. Our findings were consistent with other studies. Chauhan et al, Fernandes et al, Sharma et al and Singal et al also reported that the pleomorphic adenoma and mucoepidermoid carcinoma were the most common benign and malignant lesions affecting salivary glands in their Indian patients.^{2, 8, 10, 11} Similarly, Kate et al and Khetrpal et al have found out that pleomorphic adenoma was the most common benign lesions affecting salivary glands in their study.^{1, 6}

Among cystic, soft and other tissues lesions, lipoma, (12 cases, 08%), was the most common benign lesion while metastatic squamous cell carcinoma, (12 cases, 08%), was the most common malignant lesion. Similar results were found in other studies. Khetrpal et al have reported that the most common benign lesion involving cystic and soft tissue was lipoma which was observed in 14 cases while squamous cell carcinoma was observed in one case.¹ Kate et al also reported that most common benign lesion affecting soft and other tissues was lipoma, 22.2%.⁶

When compared to histopathology, the overall sensitivity and specificity of FNAC in diagnosing head and neck lesions was 73% & 93% respectively. Among Nepalese subject, Rajbhandari et al have reported the sensitivity and specificity of this procedure to be 86% and 97% respectively.⁷ Similarly, among Indian patients, overall sensitivity and specificity of FNAC was reported to be 93.24% and 100% by Khetrpal et al.¹ Fernandes et al reported the overall sensitivity and specificity to be 87.5% and 100% respectively while Singal et al have found that the sensitivity and specificity were 91.54% and 98.16% respectively.^{8, 11} This discrepancy in results could be due to the fact that FNAC is a blind procedure and can lead to insufficient or improper sample. Similarly, mixing of samples with macrophages or lymphoid tissue can lead to incorrect results on FNAC which histopathology can later confirm.

CONCLUSION

Head and neck region encompasses a diversified range of diseases ranging from inflammatory to malignant ones. Accurate diagnosis of these lesions is very important for their successful treatment. FNAC is a safe, reliable, convenient and minimally invasive procedure which can be done on out-patient basis. It provides accurate information in most cases which in turn helps in making treatment decisions as it ascertains the type of lesion.

Author's Contribution:

Concept & Design of Study: Nazar Muhammad Afridi

Drafting: Mohammad Umar Shah

Data Analysis: Muhammad Usman Anjum

Syed Irfan Raza Arif

Revisiting Critically: Arshad Wahab Shah

Final Approval of version: Nazar Muhammad Afridi

Conflict of Interest: The study has no conflict of interest to declare by any author.

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