

## FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) AND NECK SWELLINGS IN THE SURGICAL OUTPATIENT

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**Background:** Fine Needle Aspiration Cytology (FNAC) is a simple, quick and inexpensive method that is used to sample superficial masses like those found in the neck and is usually performed in the outpatient clinic. It causes minimal trauma to the patient and carries virtually no risk of complications. Masses located within the region of the head and neck, including salivary gland and thyroid gland lesions can be readily diagnosed using this technique. The objective of this descriptive study was to see the frequency of various pathological conditions detected on FNAC in patients presenting with neck swellings coming to Surgical Outpatient Department of Postgraduate Medical Institute, Lady Reading Hospital Peshawar. **Methods:** This study included patients with neck swellings presenting to the Surgical Outpatient Department of Postgraduate Medical Institute, Lady Reading Hospital Peshawar from January 2007 to December 2007. Patients below 18 years of age were excluded. Patients' data were recorded. Samples of FNAC were sent to the cytologist and results recorded. Frequency of various pathologies was determined. **Results:** The study included 50 patients with neck swellings. There were 16 male and 34 female patients with an age range of 15–55 years. Tuberculous lymphadenitis was the commonest diagnosis (36%) followed by reactive/non-specific lymphadenitis (18%). Other pathologies were malignant neoplasms (14%), cysts (10%), benign neoplasms (8%) and sialadenitis (6%). FNAC was inconclusive in 8% of cases. Carcinomas metastatic to lymph nodes were the most common type of malignancy followed by lymphoma and thyroid gland carcinoma (Papillary Carcinoma). **Conclusion:** It is concluded that tuberculous lymphadenitis is still the commonest condition in patients presenting with neck swellings followed by non-specific lymphadenitis and malignant neoplasms especially metastatic carcinoma. FNAC is an easy and suitable tool for the assessment of patients with neck swellings in the outpatient clinics. Although its diagnostic accuracy is limited as compared to tissue biopsy but it is a good test for both screening and follow-up. **Keywords:** Fine Needle Aspiration Cytology (FNAC), Neck swellings

### INTRODUCTION

A lump is the most likely clinical problem to be encountered in the neck. Lumps may be classified in relation to the triangles of the neck. The various triangles of the neck are Anterior, Digastric, Carotid, Muscular, and Posterior. The anatomical knowledge of these triangles is very important for understanding the differential diagnosis of various pathologies presenting as neck swellings. The common pathologies encountered in the neck presenting as a lump are lymphadenopathies (specific and non-specific, acute and chronic), metastatic carcinoma, lymphoma, thyroid swellings (goitre, nodules and cysts) and salivary gland swellings (sialadenitis, cysts, adenomas and carcinomas). The less common pathologies presenting as swelling in the neck are carotid body tumour, bronchial cyst, thyroglossal cyst, cystic hygroma, pharyngeal pouch and lumps of skin appendages.<sup>1</sup>

Fine needle aspiration cytology is a simple, quick and inexpensive method that is used to sample superficial masses like those found in the neck and is usually performed in the outpatient clinic. It causes minimal trauma to the patient and carries virtually no risk of complications. Masses located within the

region of the head and neck, including salivary gland and thyroid gland lesions can be readily diagnosed using this technique.<sup>2,3</sup> The combination of clinical examination and FNAC remains the mainstay in selecting patients for thyroid surgery.<sup>4</sup>

Fine needle aspiration cytology can be performed under local anaesthesia and is particularly useful if a neck lump is thought to be malignant. There is no evidence of spread of tumour through the skin track caused by the fine hypodermic needle used with this technique.<sup>5</sup> It is both diagnostic and therapeutic in a cystic swelling.<sup>6</sup>

Fine needle aspiration cytology is helpful for the diagnosis of salivary gland tumours where it can differentiate between a malignant and a benign tumour with over 90% accuracy.<sup>7</sup> FNAC is particularly helpful in the work-up of cervical masses and nodules because biopsy of cervical adenopathy should be avoided unless all other diagnostic modalities have failed to establish a diagnosis.<sup>8</sup>

Fine needle aspiration cytology does not give the same architectural detail as histology but it can provide cells from the entire lesion as many passes through the lesion can be made while

aspirating.<sup>9</sup> All neck masses should undergo FNAC and culture if necessary.<sup>10</sup>

The purpose of this study was to highlight the frequency of various neck pathologies with the help of FNAC in outpatient clinic which will help in understanding the pattern of neck pathologies in the local setting and to take measures accordingly.

### MATERIAL AND METHODS

This study was conducted in the surgical 'C' unit of Postgraduate Medical Institute, Lady Reading Hospital, Peshawar. A total of 50 cases were selected in one year time from January 2007, to December 2007.

Fine Needle Aspiration Cytology was done in the hospital's surgical outpatient department. Slides were made and sent to pathologist for cytology. In few cases, patients were sent to the cytologist for second sample due to error in sample collection.

All patients above 15 years of age belonging to both sexes, who presented to general surgery outpatient department of Postgraduate Medical Institute, Lady Reading Hospital, Peshawar with a lump in neck during the study period were included in the study. Any patients with mass other than neck masses were excluded from the study.

Apparatus used included 10 ml or 20 ml disposable plastic syringe, 22–25 gauge, 0.6–1.0 mm external diameter disposable needle, 3.98 cm and 8.8 cm long with or without stylet, antiseptic sponges, sterile gauze pads, microscopic glass slides, tissue culture transport media and local anaesthetic injection.

The data analysis was performed using SPSS version 10.

### RESULTS

The study included 50 patients with neck swellings. There were 34 (68%) female and 16 (32%) male patients with an age range of 15–55 years. Tuberculous lymphadenitis 18 (36%) was the commonest diagnosis followed by reactive/non-specific lymphadenitis 9 (18%). Other pathologies found were malignant neoplasms 7 (14%), cysts 5 (10%), benign neoplasms 4 (8%) and sialadenitis 3

(6%). FNAC was inconclusive in 4 (8%) of cases. Carcinomas metastatic to the lymph nodes was the most common type of malignancy followed by lymphoma and papillary thyroid carcinoma.

The results are tabulated as Table-1 and Table-2.

**Table-1: Results of FNAC of neck swellings, showing the relative frequencies of various pathological conditions (n=50)**

Diagnosis	No. of cases	%
Lymphadenitis		
1- Reactive/non-specific	9	18
2- tuberculous	18	36
Malignant neoplasm	7	14
Cysts	5	10
Benign neoplasms	4	8
Sialadenitis	3	6
Unsatisfactory	4	8

### DISCUSSION

This study was carried out to find out the relative frequencies of various pathologies presenting as lump in the neck in the surgical outpatient department. Fine needle aspiration cytology was performed to achieve the desired objective. The results achieved in the present study were compared with different national and international studies.

Tuberculous lymphadenitis was found to be the most common pathology in our study accounting for 36% of cases followed by reactive/non-specific lymphadenitis constituting 18% of cases and metastatic carcinoma found in 14% of cases. el-Hag *et al*<sup>11</sup> carried out a similar study in Saudi Arabia over a period of five years which included 225 patients. This study was published in 2003 and it showed reactive/non-specific lymphadenitis to be the commonest cause of neck masses accounting for 33% of cases. Tuberculous lymphadenitis was found to be the next most common pathology constituting 21% of cases followed by malignant swellings found in 13% of cases. Another study carried out by Kamal<sup>12</sup> in Lahore published in 1996 found tuberculous lymphadenitis to be the cause in 13% of neck swellings while 11% of swellings were found malignant. Other causes included goitres, cysts

**Table-2: Comparison with international studies**

	Present study	El Hag <i>et al</i> <sup>11</sup>	Kamal F <sup>12</sup>	Cheng AT <sup>13</sup>	Schelkun PM <sup>14</sup>	Schwarz R <sup>15</sup>
Location	Peshawar	Saudi Arabia	Lahore	Auckland	Chicago	Columbia
Year of publication	This study	2003	1996	1992	1991	1990
No of patients	50	225	847	187	209	182
Duration of study (years)	1	5	1	1	3	5
Reactive/non-specific lymphadenitis (%)	18	33				
TB lymphadenitis (%)	36	21	13			
Malignant neoplasms (%)	14	13	11	50	40.3	48
Cysts (%)	10	11	3.6			
Benign neoplasms (%)	8	9	1			
Sialadenitis (%)	6	5	0.6			
Inconclusive (%)	8		1.3		14.6	9.3

and inflammatory swellings of salivary gland, thyroid and lymph nodes.

Cheng<sup>13</sup> in his study carried out in Auk Land, New Zealand included 187 patients, found malignancy to be the cause in 50% of cases. This shows an epidemiological variation between the developed and developing countries. Infections like TB are more commonly found in developing countries while malignancies as cause of neck swellings are more common in developed countries. Similarly, studies done by Schelkun<sup>14</sup> and Schwarz<sup>15</sup> in Chicago (US) and Columbia (Canada), respectively, clearly show that majority of neck masses are malignant (40% and 48% respectively). Stevenson<sup>16</sup>, in his study of 120 patients, carried out at Christchurch, New Zealand, found that 28% of the swellings are malignant which is similar to the pattern of disease in developed countries. Similarly, studies done in developing countries have consistently shown tuberculous and reactive/non-specific lymphadenitis to be the more common cause.

## CONCLUSION

It is concluded from the present study, that tuberculous lymphadenitis is the commonest problem in patients presenting with neck swellings in our set-up, followed by non-specific lymphadenitis and malignant neoplasms especially metastatic carcinoma. In addition FNAC is an easy and suitable tool for the assessment of these patients in the outpatient clinics.

## REFERENCES

1. Lumley JSP. Physical signs. 18<sup>th</sup> ed. Oxford: Butterworth-Heinemann; 1997.

2. Celeste NP, Williams JF. Fine needle aspiration biopsy of the head and neck. USA: Butterworth Heinemann; 1996.p 1–13.
3. Gamba PG, Messineo A, Antonello LM, Boccato P, Blandamura S, Cecchetto G, *et al.* A simple exam to screen superficial masses, FNAC. *Med Pediatr Oncol* 1995;24:97–9.
4. Lee JC, Siow JK. Thyroid surgery-the Tan Tock Seng Hospital otolaryngology experience. *Ann Acad Med Singapore* 2002;31:158–64.
5. Russel RCG, William NS, Bulstrode CJK. Bailey and Love's short practice of surgery. 24<sup>th</sup> ed. London: Arnold; 2004.
6. Afridi S, Malik K, Waheed I. Role of fine needle aspiration biopsy and cytology in breast lumps. *J Coll Physicians Surg Pak* 1995;5:75–7.
7. Burnand KG, Young AE, Lucas J, Rrolands BJ, Scholefield J. The new Aird's companion in surgical studies. 3<sup>rd</sup> ed. China: Elsevier; 2005.
8. Layfield LJ. Fine-needle aspiration of the head and neck. *Pathology (Phila)* 1996;4:409–38.
9. Kirk RM, Ribbans WJ. Clinical Surgery in General. 4<sup>th</sup> ed. Edinburgh: Elsevier; 2004.
10. Klingensmith ME, Amos KD, Green DW, Halpin VJ, Hunt SR. The Washington Manual of Surgery. 5<sup>th</sup> ed. Philadelphia: Lippincott Williams and Wilkins; 2005.
11. el Hag IA, Chiedozi LC, al Reyees FA, Kollur SM. Fine needle aspiration cytology of head and neck masses. Seven years' experience in a secondary care hospital. *Acta Cytol.* 2003;47(3):387–92.
12. Kamal F, NiazI S , Nagi AH, Jaradi MA, Naveed IA. Fine needle aspiration cytology (FNAC): an experience at King Edward Medical College, Lahore. *Pak J Pathol* 1996;7:33–6.
13. Cheng AT, Dorman B. Fine needle aspiration cytology: the Auckland experience. *Aust N Z J Surg.* 1992;62:368–72.
14. Schelkun PM, Grundy WG. Fine-needle aspiration biopsy of head and neck lesions. *J Oral Maxillofac Surg* 1991;49:262–7.
15. Schwarz R, Chan NH, MacFarlane JK. Fine needle aspiration cytology in the evaluation of head and neck masses. *Am J Surg* 1990;159:482–5.
16. Stevenson DS, Allison RS, Robertson MS, Hamer JW. Aspiration cytology in the diagnosis of head and neck masses: the early Christchurch experience. *N Z Med J* 1989;102:639–41.

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