



## CAPILLARY TECHNIQUE OF CYTOLOGY IN SALIVARY GLAND AND LYMPHNODE LESIONS IN HEAD AND NECK

### Pathology

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### ABSTRACT

**Background:** We present a modified technique of fine needle biopsy also known as, "fine needle capillary technique". This technique was first developed by Zajdela and coworkers (1987) as a cytological method in benign and malignant breast lesions. Fine needle capillary technique does not require aspiration of cell samples via negative pressure created by a syringe. A thin 25 G needle (outer diameter 0.50 mm, length 25 mm) is introduced into the lesion with one hand. The cells are detached by the cutting edge of the needle and are conducted into the lumen by capillary force. The needle is removed and the cellular material is expelled onto a glass slide, spread, and immediately fixed

**Materials & Methods:** The present study was undertaken to assess the quality of smears obtained by capillary technique while comparing it with aspiration cytology in lymphnode and salivary glands. Included granulomatous, suppurative, non-specific lymphadenitis, Non Hodgkin lymphoma, Hodgkin lymphoma, metastasis, were chronic sialadenitis, suppurative parotitis, pleomorphic adenoma, adenoid cystic carcinoma and Mucoepidermoid carcinoma. Mair et al point scoring system was used to score the aspirates

**Results:** Total number of lymphnode lesions were 28. Out of these, granulomatous lymphadenitis constituted 10 cases (35.71%), Non Hodgkin lymphoma 3 cases (10.71%), Hodgkin lymphoma 2 cases, suppurative lymphadenitis 2 cases (7.14%), Metastasis 7 cases (25%), and the rest 4 cases (14.28%) were reactive lymphadenitis. Salivary gland lesions were 18 (13.04%). Of these 3 cases (17.6%) were chronic sialadenitis, 2 cases (16.66%) were suppurative parotitis, 11 (61.11%) pleomorphic adenoma, 1 case (5.55%) of adenoid cystic carcinoma and 1 case of Mucoepidermoid carcinoma.

**Conclusion:** Fine needle capillary technique is easy to perform, has better patient acceptability, and gives good quality smears in lymphnode aspirates however aspiration technique yields good amount of cellular material than capillary technique in salivary gland aspirates which is optimal for diagnosis

### KEYWORDS

capillary technique, Fine needle aspiration, mair, salivary glands, lymphadenitis, Hodgkin lymphoma

### INTRODUCTION

Fine needle cytology (FNC) has gained tremendous popularity in recent times among the clinicians and the pathologists. It is easy to perform, quick and has a high degree of specificity and sensitivity.<sup>[1]</sup> Capillary and aspiration technique are the two techniques of fine needle cytology (FNC). FNC is used to sample all superficial mass lesions and even deeply seated lesions. Deeply seated lesions can be sampled with the aid of imaging techniques. The basic principle underlying fine needle aspiration cytology is the aspiration of cellular material from the target masses often utilizing fairly high suction pressure. The procedure requires a needle and a syringe advisedly held in a syringe holder enabling single handed suction to be exercised. This technique depends on the suction and is painful, traumatic and can cause hematomas, necrosis as well as yield hemorrhagic material.<sup>[2]</sup> In more recent times a modified technique called capillary technique, pioneered in France came into vogue in 1981.<sup>[3,4]</sup> It eliminates active aspiration by syringe, replacing it by the principle of capillary suction of fluid or semi fluid material into a thin channel (fine needle). It is less painful, less traumatic, and patient-friendly.

### MATERIALS & METHODS

A total of 46 cases of which 28 cases of lymphnode swelling and 18 cases of salivary gland were studied. Relevant clinical details including the site and size of the swelling, duration since onset, signs and symptoms associated with the swelling and other investigations done were noted in a proforma prepared for this study.

### PROCEDURE :

#### Capillary technique :

The procedure was carried out under strict aseptic precautions. The swelling to be sampled was firmly fixed with one hand. With the other hand a needle of 23-25 gauge, held directly between finger tips, was introduced into the swelling. The needle was moved back and forth being angled in different directions and at different depths. It was withdrawn, connected to a disposable 10ml syringe filled with air and the material was expelled onto the glass slides. Using another glass slide smears were made by applying gentle and uniform pressure.

In cystic lesions when fluid material appeared at the hub of the needle, the procedure was abandoned, needle was withdrawn and aspiration technique was followed.

#### Fine Needle Aspiration technique :

After the non-aspiration technique, another needle of 23-25 gauge attached to a disposable 10ml syringe was introduced into the swelling. The piston of the syringe was withdrawn to create negative pressure. The needle was moved back and forth in different directions and at different angles. The negative pressure was released before withdrawing the needle with the syringe. The syringe was disconnected from the needle, air filled into it and reconnected to the needle to expel the material onto the glass slides. Smears were made as explained above.

The smears were stained with PAP and MGG

#### METHOD OF ANALYSIS :

The smears made by both Capillary and FNA techniques were analysed for quality, using predetermined point scoring system developed by Mair et al. The two techniques were compared for amount of cellular material, background blood or clot, retention of appropriate architecture, degree of cellular degeneration and degree of cellular trauma. For each of these criteria, smears were given a score of 0-2. The total score was calculated, which varies from 0-10

Table - 1

Criterion	Quantitative Description	Point Score
Background blood or clot	Large amount ; great compromise to diagnosis.	0
	Moderate amount ; diagnosis possible	1
	Minimal ; diagnosis easy ; specimen of 'text book' quality	2
Amount of cellular material	Minimal to absent, diagnosis not possible	0
	Sufficient for cytodiagnosis	1
	Abundant ; diagnosis simple	2
Degree of cellular degeneration	Marked ; diagnosis impossible	0
	Moderate ; diagnosis possible	1
	Minimal ; good preservation, diagnosis easy	2
Degree of cellular trauma	Marked ; diagnosis not possible	0
	Moderate ; diagnosis possible	1
	Minimal ; diagnosis obvious	2

Retention of appropriate architecture	Minimal to absent ; non diagnostic	0
	Moderate; some preservation of eg. Follicles, papillae, acini, flat sheets, syncytia or single cell patterns	1
	Excellent architectural display closely reflecting histology diagnosis obvious	2

## RESULTS

Total number of lymphnode lesions were 28. Out of these, granulomatous lymphadenitis constituted 10 cases (35.71%), Non Hodgkin lymphoma 3 cases (10.71%), Hodgkin lymphoma 2 cases, suppurative lymphadenitis 2 cases (7.14%), Metastasis 7 cases (25%), and the rest 4 cases (14.28%) were non specific lymphadenitis.

**LYMPHADENITIS :** This accounted for total of 16 out of 28 lymphnode lesions (57.14%). Cytology of granulomatous lymphadenitis showed good number lymphocytes, few macrophages, neutrophils, aggregation of epithelioid cells [Fig 1a and 1b] and some giant cells. Background contained necrotic material. Cases of suppurative lymphadenitis showed plenty of neutrophils, few lymphocytes and macrophages. The background was necrotic hence tuberculosis was suspected clinically but ZN stain was negative for bacilli

## MALIGNANT NEOPLASMS:

It was seen in 12 out of 28 (42.85%) lymphnode aspirates. 3 cases were of Non Hodgkin lymphoma, 2 cases of Hodgkin lymphoma, Out of 7 case of metastasis 3 cases were metastatic adenocarcinoma, 3 were metastatic squamous cell carcinoma and other case was metastasis from Papillary carcinoma of thyroid.

Smears from Hodgkin lymphoma showed mononuclear variants of RS cell admixed within a population of mixed inflammatory background consisting of eosinophils, plasma cells, lymphocytes and occasional neutrophils. In Non Hodgkin lymphoma smears showed monotonous population of lymphocytes with coarse chromatin and inconspicuous nucleoli.

Smears from metastatic squamous cell carcinoma showed large polygonal cells with moderate amount of cytoplasm and centrally placed large, irregular and hyperchromatic nuclei. These cells were present singly, some of them showing keratinization and mitotic figures. Binucleated cells were also seen.

Smears from metastatic adenocarcinoma showed cells arranged in clumps, acini and singly. These cells were round with a large hyperchromatic nuclei placed centrally. Some showed binucleation. In 2 cases papillary fronds were seen. In one case the cells had signet ring appearance, forming tight clusters.

One case of papillary carcinoma with metastasis to cervical lymphnode was seen. Smears from both thyroid and lymphnode showed similar cytology, comprising of round to oval cells arranged in follicles and clumps. These cells had pleomorphism and showed intranuclear cytoplasmic inclusions and grooves.

When all the lymphnode lesions were considered together, the capillary technique was superior, for the parameters background blood or clot, amount of cellular material, retention of appropriate architecture and in the cumulative score and statistically significant difference was seen in retention of architecture, cell trauma and cumulative score. Salivary gland lesions were 18 (13.04%). Of these 3 cases (17.6%) were chronic sialadenitis, 2 cases (16.66%) were suppurative parotitis, 11 (61.11%) pleomorphic adenoma, 1 case (5.55%) of adenoid cystic carcinoma and 1 case of Mucoepidermoid carcinoma.

## DISCUSSION

In the present study capillary technique yielded good preservation of architecture. In the study of superficial lymphadenopathy by Akhtar SS et al<sup>[5]</sup>. Cajulis RS & Sneige N, found that capillary technique provides an adequate number of cells both for diagnosis and for special studies.<sup>[6]</sup> Misra R.K. et al<sup>[7]</sup> found retention of architecture to be better in the capillary technique. These findings were in concordance with the present study. Also, Mair et al<sup>[8]</sup> and Braun H. et al<sup>[9]</sup> have found similar findings. When compared for the degree of cellular trauma and cellular degeneration better results were obtained by capillary technique, though the differences were marginal. Similar results were seen by

Misra R.K. et al & Ghosh A et al<sup>[10]</sup>.

In the present study, the average cumulative score was 5.30 in capillary technique and 6.28 in aspiration techniques. Better average scores were observed in the capillary technique. These findings were similar to that obtained by Ghosh A et al and Misra R.K. et al. Excess pressure applied while making the smears, can cause crushing and fragmentation. If smears are not fixed immediately or if excess blood is present, it can alter the cell morphology. In the present study, both the aspiration and the capillary techniques were performed by a single pathologist who also prepared the smears. Smears were made by applying optimal pressure. Smears were well spread out, avoiding clumping of the cells, immediately fixed in appropriate fixative and later taken for staining. Hence, in the present study no significant difference was noticed in amount of cellular degeneration and trauma. The average cumulative score was similar in the capillary technique and the aspiration technique. The previous studies of Misra RK et al and Mair et al have given higher scores for the capillary technique.

In the capillary technique the needle can be moved freely in any desired direction. It causes less blood contamination and is less painful. In the aspiration technique, keeping the plunger pulled back to create a negative pressure, it becomes difficult to control the precise needle movements, causing more trauma and hence more blood contamination. The negative pressure created in the capillary technique is not sufficient to obtain the thick myxoid stroma of the pleomorphic adenoma. The inflammatory lesions were more fibrotic requiring more negative pressure to aspirate.

## CONCLUSION

Fine needle capillary technique is easy to perform, has better patient acceptability, and gives good quality smears in lymphnode aspirates however aspiration technique yields good amount of cellular material than capillary technique in salivary gland aspirates.

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