"DIAGNOSTIC EFFICACY OF FNAC IN CERVICAL LYMPHADENOPATHY"- A ONE YEAR HOSPITAL BASED CROSS SECTIONAL STUDY

By

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Dissertation

Submitted to the KLE UNIVERSITY BELGAUM, Karnataka
In partial fulfillment of the requirements
For the degree of

MASTER OF SURGERY (M.S.)

IN

OTORHINOLARYNGOLOGY

Under the guidance of
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DEPARTMENT OF OTORHINOLARYNGOLOGY

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BELGAUM-590010.

MAY - 2010

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ACKNOWLEDGEMENT

I take this opportunity to express my most humble and sincere gratitude towards ***Dr. R. S. Mudhol,*** *M.S.(ENT),D.L.O, Professor, Dept. of Otorhinolaryngology and Head and Neck Surgery, Jawaharlal Nehru Medical College, Belgaum, who being the guiding spirit behind this dissertation, for his continuous supervision, valuable suggestions and constant encouragement throughout the study which facilitated the completion of my dissertation. His personal interest and enthusiasm towards this study and the subject of Otorhinolaryngology and Head and Neck Surgery is truly remarkable. He has always been very critical and analytical from a wholly constructive viewpoint, always making constructive suggestions to improve not only this study but also my entire approach to the subject and its practice. He has boosted my morale where required and for his constant willingness and amenability, I am greatful.*

I am truly greatful to ***Dr. N.D.Zingade*** *M.S, Professor and Head of the Department of Otorhinolaryngology and Head and Neck Surgery, Jawaharlal Nehru Medical College, for the advice and guidance I have received from him throughout my tenure as a postgraduate. His wealth of knowledge on the subject and experiences of working with various cases and situations is truly remarkable. He has shared freely with me his experiences of working abroad and helped me hone my approach to the subject to bring my performance on the whole to a level which would rank with any other postgraduate in the Western hemisphere.*

It is with great appreciations that I owe my special thanks to ***Dr. R. N. Patil*** *MS,* ***Dr. B. P. Belaldavar*** *M.S,D.L.O,* *and* ***Dr. Anil .S. Harugop*** *M.S, Professor in the Department of Otorhinolaryngology and Head and Neck Surgery, J. N. Medical College, for their unhesitating, helpable guidance, constant encouragement and motivation. I am extremely obliged to them.*

My sincere thanks to ***Dr. N.R.Ankale*** *M.S, Assistant Professor,* ***Dr.R.B.Metgudmath*** *M.S Assistant Professor and* ***Dr.Prashant Patil*** *M.S Assistant Professor Department of Otorhinolaryngology and Head and Neck Surgery, J. N. Medical College for their contribution of constructive encouragement and never ending help throughout my three years tenure as a postgraduate.*

I congregate my gratification to ***Dr. Preethi .S. Hajare*** *D.N.B,D.L.O Assistant Professor,* ***Dr. Amit. Nargund*** *MS, Assistant Professor and* ***Dr. Vinita .V. Metgudmath*** *MS Assistant Professor for their help and guidance during my course.*

I thank most of all, ***Dr.V.D.Patil*** *M.D,D.C.H Principal, J. N. Medical College and* ***Dr. M.V.Jali,*** *MD and CEO, K.L.E Society's Dr Prabhakar Kore Hospital and MRC, Belgaum for their unfailing support, and help throughout my course by providing means and materials for my study.*

My sincere thanks to ***Dr. Prabhakar B. Kore,*** *Chairman KLE Society for his support throughout my course of post graduation.*

I thank my friends and my colleagues in the Department of ENT, who rendered help and support during my postgraduate course.

*I would like to acknowledge the tireless and timely work done by **Miss.Veena** and **Mr.Deepak** of **Sai Xerox and D.T.P centre** for their excellent data processing and completion of this manuscript in a very short time.*

*Last but not the least I would like to thank my wife **Dr. Geeta Usha Sree** and **family members** for their unfailing support right from day one till date through all the times of hardship.*

Dr. P Kumar Chowdary Ganga

LIST OF ABBREVIATIONS

ABT	-	Antibiotic treatment
ATT	-	Anti tubercular treatment
B/L	-	Bilateral
CA	-	Carcinoma
CNSL	-	Chronic non specific lymphadinits
DOA	-	Date of Admission
ENT	-	Ear, Nose, Throat
ESR	-	Erythrocyte sedimentation rate
F	-	Female
Fi	-	Firm
FNAC	-	Fine needle aspiration cytology
Fx	-	Fixed
H	-	Hard
HL	-	Hodgkin’s lymphoma
L	-	Left
M	-	Male
Ma	-	Matted
MDL	-	Middle deep cervical
Mo	-	Mobile
NHL	-	Non Hodgkin’s lymphoma
PT	-	Posterior triangle
R	-	Right
RAD	-	Radiation therapy
SL	-	Submental
SM	-	Submandibular
TB	-	Tubercular lymphadenitis
UDL	-	Upper deep cervical

ABSTRACT

Background and objectives:

Head and Neck region being rich in lymphatics, cervical lymphadenopathy is relatively common clinical observation. Cervical lymphadenopathy, often presents a diagnostic dilemma to the surgeon. It is imperative to establish a definitive diagnosis as early in the evaluation as possible in order to institute a meaningful treatment. The various avenues available for this are clinical evaluation, aspiration biopsy and open biopsy. The study will be carried out with the objective of assessing the diagnostic efficacy of FNAC, for arriving at early diagnosis.

Method:

Detailed history will be taken followed by physical examination in all the patients with cervical lymphadenopathy. Subsequently all the cases will be subjected to an aspiration biopsy and excision biopsy.

Results:

Tuberculosis was a predominant cause for cervical lymphadenopathy in this study and found to be more in lower socio-economic group. Sensitivity, specificity and efficiency of FNAC in our study respectively was 90%, 100% and 96.57%.

Interpretation and Conclusion:

FNAC is a simple and safe procedure, which can be employed on out patient basis with reasonably good results. Aspiration cytology can be done easily without subjecting the patient to general anaesthesia.

Key words: Cervical lymphadenopathy, FNAC.

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INTRODUCTION

Head and neck region being rich in lymphatics; lymphadenopathy is relatively common clinical observation. Cervical lymphadenopathy, often presents a diagnostic dilemma to the surgeon. It is imperative to establish a definitive diagnosis as early in the course of evaluation as possible in order to institute a meaningful treatment. The various avenues available for this are the clinical evaluation, aspiration biopsy and open biopsy.

Each method of diagnosis has its own advantages and drawbacks. Traditionally, surgical biopsy and its histo-pathological study has remained the main stay for the diagnosis of the cervical lymphadenopathy. Here, the whole tissue is available for examination under microscope.

Of late, a parallel but separate discipline has arisen for the diagnosis of neck masses, it is called as fine needle aspiration cytology (FNAC). The fine needle aspiration cytology involves the study of cells obtained by fine needle under vacuum. Unlike biopsy, the whole tissue is not available for microscopic examination; as only cells available for microscopic examination, still it is possible to have a high diagnostic accuracy.

The biopsy has certain disadvantages like, anaesthesia is needed for obtaining biopsy, time is needed to get the report, and biopsy produces a scar over the operated area. Also, cost needed for biopsy procedure is more. Whereas, fine needle aspiration cytology is OPD or office procedure which does not require anaesthesia, diagnosis is obtained quickly, complications are almost nil and diagnostic accuracy is high.

Therefore, aspiration cytology can be used to establish a diagnosis and plan the patient's future therapy prior to hospitalisation or for treatment on out patient basis alone. Such confirmed diagnosis permits better use of hospital facilities.

This procedure also provides material for the special studies as cytochemistry, ultrastructural examination, Immunopathology and culture.

Along with other advantages, it offers a new dimension of co-operation between cytopathologist, the radiologist and the medical specialist in this era of emphasis on ambulatory care.

This study “Diagnostic efficacy of FNAC in cervical lymphadenopathy” deals with the relative diagnostic accuracy of aspiration cytology in comparison to open biopsy.

AIMS AND OBJECTIVES

1. To study the sensitivity and specificity of FNAC
2. To assess the relative diagnostic efficacy of clinical evaluation, aspiration biopsy and evolving a protocol for arriving at an early diagnosis.
3. To study the prevalence of cervical lymphadenopathy in respect to age, sex in this part of the country.

REVIEW OF LITERATURE

Historical review:

The technique of needle aspiration dates back to nineteenth century. Aspiration cytology was first reported by kun in 1847.

In 1904, Greig and Gray successfully sucked Juice from cervical nodes to identify trypanosomes. Chatard and Guthrie performed needle aspiration biopsy from lymphnodes of patients with sleeping sickness and tuberculosis and by 1921, Guthrie had examined cells from patients with lymphoma and carcinoma.

In 1925, Surgeons Marti and Coley used 18 gauge needle for aspiration at memorial hospital New York and they were the advocates of aspiration biopsy in America.

In 1927, Forkner, obtained benign and malignant cells from lymphnodes using a fine bulb passed through an 18 gauge needle. By 1933 Martin and Ellis reported their findings from 65 malignant tumour by introducing the needle aspiration technique.

Stewart in 1933 had reported a series of 725 aspirates of superficial masses from the memorial hospital New York. Despite this experience, it failed to gain popularity until interest was reviewed at Kalolinka institute in stockhome by Engzell and colleagues in early 1950 with excellent results.

In 1940 Loper and Cardoz (Haematologist) used air dried slides with may grunwald - giemsa stain (MGG stain) for use in cytology.

However in 1947 Oschener and De bakey condemned the procedure because they had seen three patients in whom tumour implants had occurred along the site of

the needle puncture. But this was because of the unsafe of the wide bore needles (18 gauge). But this now stands invalid with the current use of the small bore needles (22 gauge) Godwin in 1956 reported that about 2,500 aspiration were performed annually at their centre.

In 1954 Cardozo published a monograph with an extensive summary of the value of NAB for diagnosis of lymphoma, metastasis and soft tissue proliferations.

Zajicek and Franzen in 1968 described the method of fine needle aspiration cytology as accepted today in 1974 Zajicek published his classical work reflecting the wealth of fine needle aspiration cytology from scandinavian experience.

As emphasized by wahum et al; (1978) Frable and Frable (1979) and weymuller et al (1983), the technique is simple, no anaesthesia is needed. It is rapid cost contained and is effective in terms of diagnostic accuracy.

Elliot Abemayor in 1985 reported CAT directed fine needle aspiration biopsies of masses in head and neck. All this patients had high quality CAT scan with intravenous contrast in order to outline the lesion. A 22 or 25 gauge needle was passed into the lesion and needle tip confirmation was done by another scan. Smears were prepared and studied before the patient left the C.T room, so that repeat aspirate could be done in case of inadequate specimen.

Schwarz et al in 1990 in their study concluded that fine needle aspiration cytology is safe and reliable technique in the evaluation of neck masses. A standardized collection and processing method minimizes the number of unsatisfactory specimens. Fine needle aspiration cytology is quick, easy and cost effective procedure and should be considered in first line investigation of neck masses. Richard H.V. et al, 1998 in a study said that all adults with troublesome neck

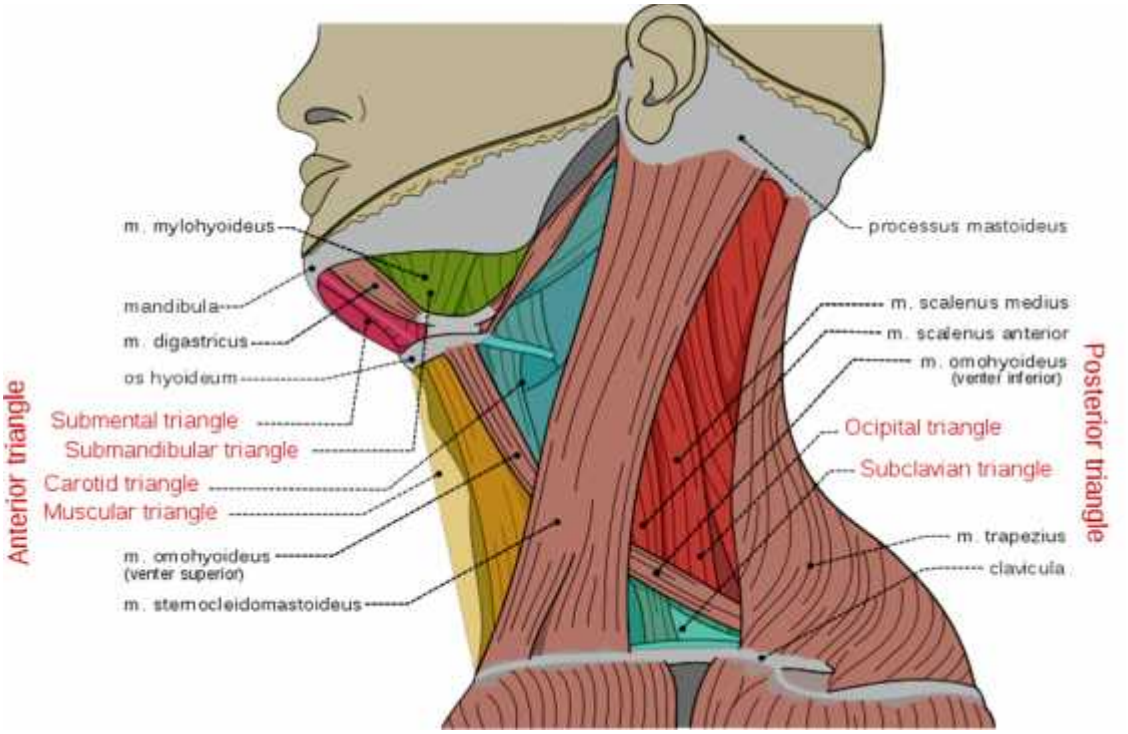
masses should undergo fine needle aspiration cytology. In presence of an expert cytologist, the information yield is high.

Jandu M. et al, in 1999 did a study, they got 100% accuracy where fine needle aspiration cytology was performed by consultant and 91% when performed by Junior staff. They said fine needle aspiration cytology is a useful diagnostic tool for head and neck masses.

The main objections to the method are possible seedling of the neoplastic cells along the needle tract and dissemination of such cells through efferent lymphatics or blood vessels. However extensive clinical research and experimental study has been carried out to prove its safety. Frable in 1976 searched the literature for a report on the possibilities of the spreading or seedling of the tumour cells by the needle. But this was usually with a Vilm-Silverman needle biopsy but not following fine needle aspiration.

Fine needle aspiration cytology has come of age and its future is limitless.

In 1971, Engez et al reported 10-15 years follow up of 157 patients with pleomorphic adenoma of the major Salivary glands on whom for FAA.C. had been performed. There was no evidence of recurrence or local extension of tumour growth attributable to the procedure. And in a further study of the 656 patients with metastatic disease in lymphnodes diagnosed by aspiration cytology and with follow up for 5 years, there was no evidence recurrence or local extension. In addition experimental work with rabbits failed to show that fine needle aspiration released any carcinoma cells into lymphatics or blood circulation. Possible complications are formation of echymosis or haematoma (Deely TA, Platt J.C et al , Roland N.J. et al, and Schwarz R et al).


m. mylohyoideus
mandibula
m. digastricus
os hyoideum
Submental triangle
Submandibular triangle
Carotid triangle
Muscular triangle
m. omohyoideus (venter superior)
m. sternocleidomastoideus
Anterior triangle
processus mastoideus
m. scalenus medius
m. scalenus anterior
m. omohyoideus (venter inferior)
Ocipital triangle
Subclavian triangle
m. trapezius
clavicula
Posterior triangle

ANATOMY OF CERVICAL LYMPHNODES

There are about 800 lymph nodes in the body and out of them 300 are in the neck. Before discussing about the anatomy, we will talk about the triangles of the neck.

Triangles of the neck:

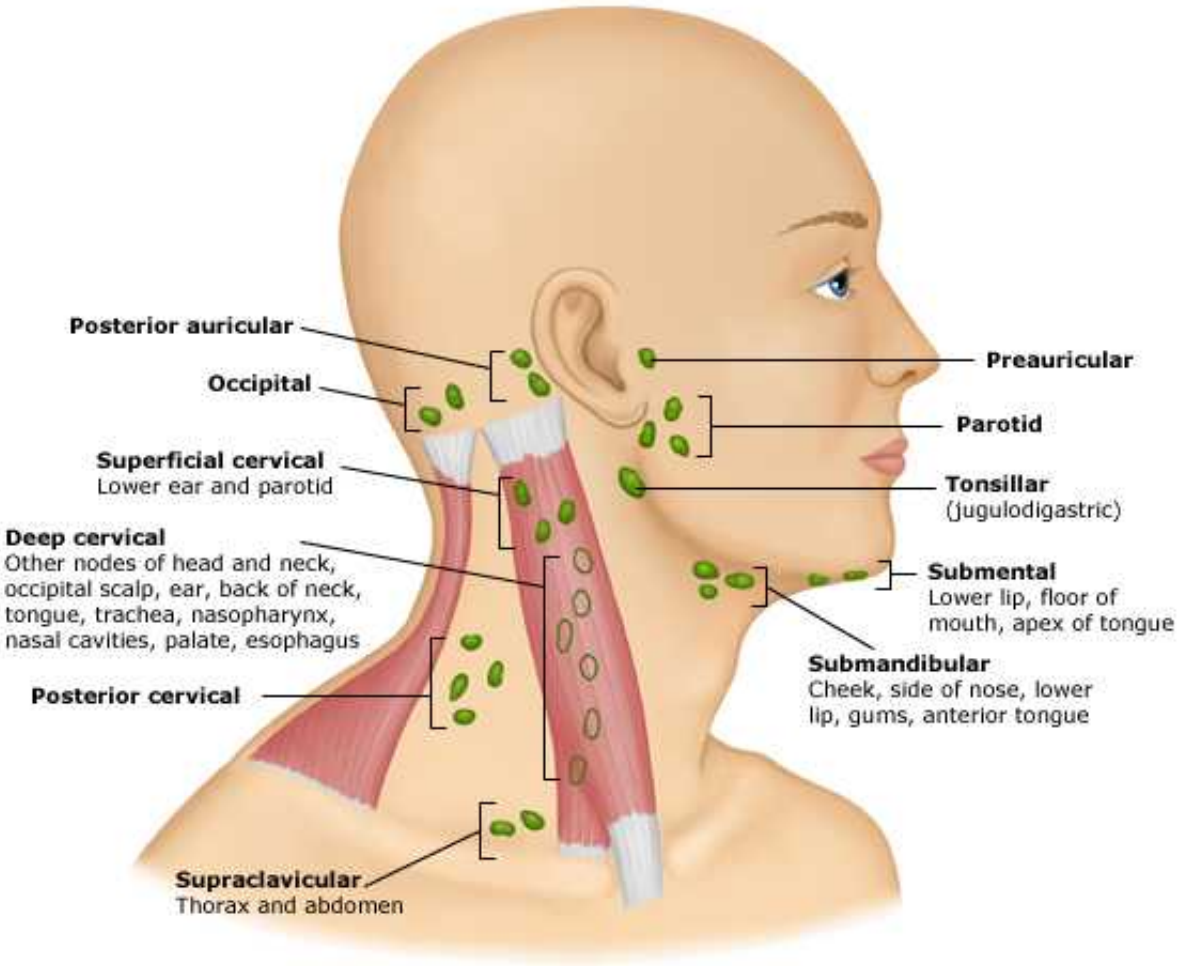
Side of neck is limited above by the ramus of the mandible and a line drawn from the angle of the mandible to the mastoid process. Below, it is limited by the upper border of clavicle. In front by the anterior median line of the neck and behind by the anterior margin of trapezius. The side of neck is being divided into two triangles by the stemocleidomastoid, which runs obliquely across the neck from sternum and clavicle below to the mastoid process and occipital bone above. The area in front of this muscle is called Anterior triangle is again divided into

1. Muscular triangle
2. Carotid triangle
3. Digastric triangle
4. Submental triangle

The division is done by superior belly of omohyoid and the posterior and anterior belly of digastric and the stylohyoid.

Anatomy of cervical lymph nodes

The posterior triangle of the neck is divided into Occipital and Supraclavicular triangle by the inferior belly of omohyoid.


Posterior auricular
Occipital
Superficial cervical
Lower ear and parotid
Deep cervical
Other nodes of head and neck, occipital scalp, ear, back of neck, tongue, trachea, nasopharynx, nasal cavities, palate, esophagus
Posterior cervical
Supraclavicular
Thorax and abdomen
Preauricular
Parotid
Tonsillar
(jugulodigastric)
Submental
Lower lip, floor of mouth, apex of tongue
Submandibular
Cheek, side of nose, lower lip, gums, anterior tongue

The classification of cervical lymphnodes is as follows

1) Circular chain of nodes

2) Vertical chain of nodes

Out of these the vertical chain of nodes is terminal group and is in close relation with carotid sheath. These groups are otherwise known as deep cervical lymphnodes. The efferent vessels from all these nodes join to form jugular trunk. It joins either at the junction of the internal jugular vein and subclavian vein or in the right lymphatic duct. Occasionally it joins the jugular or subclavian vein. The part below the level of neck drains into thoracic duct.

Circular or horizontal chain of nodes:

The groups that are classified under this headings are

1 Occipital nodes

2 Posterior auricular nodes

3 Pre auricular nodes

4 Parotid lymph nodes

5 Facial lymph nodes

6 Submaxillary lymph nodes

7 Submental lymph nodes

8 Superficial cervical nodes

9 Anterior cervical nodes.

1. Occipital lymph nodes:

They are solitary sometimes two in number and are situated midway between the mastoid process and external occipital protuberance. They are in close relation with the greater occipital nerve. They cause neuralgia in the distribution of the nerve when enlarged. The drainage field is limited to the back of scalp.

2. Posterior auricular nodes:

They are two to four in number and situated behind the pinna of the ear. The drainage area consist of temporal region, pinna of the ear (posterior part) and the external auditory meatus.

3. Pre auricular node:

It is situated in front of the tragus of the ear superficial to the fascia covering the parotid. It drains side of the scalp and the anterior surface of the pinna including the outer aspect.

4. Parotid lymph nodes:

Situated both in the substance of the parotid salivary gland and deep to it. It drains nasopharynx and back of the nose. It also drains eyelids, front of the scalp, external auditory meatus and tympanic cavity.

5. Facial lymph nodes:

They are divided into superficial and deep group. The superficial group includes the infra orbital, buccinator and the supramandibular which is situated infront of the masseter. These nodes drain the conjunctiva, eyelids and the cheeks.

The deep group lies in relation to the lateral pterygoid muscle and drains the temporal, infratemporal fossa, the back of nose and pharynx.

6. Submaxillary lymph nodes:

Situated in close relation with the submaxillary salivary gland. The lymph nodes are deep to the fascia near the salivary gland. The gland lies behind the S shaped bend of external maxillary artery. These nodes are of importance with the view point that its excision in the case of carcinoma of tongue is must otherwise the disease may reccur. The drainage area comprises of the inner angle of eye, the whole of outer part of lower lip, gums and side of the tongue.

7. Submental nodes:

Usually coupled, surgically not of much importance and are situated on the mylohyoid muscle. Drains the lower lip, tip of the tongue and cervical part of the floor of the mouth. They are affected in very rare cases.

8. Superficial cervical nodes:

They are in relation with the external jugular vein on outer surface of sternocleidomastoid.

9. Anterior cervical nodes:

This group consists of

I) Infra hyoid nodes

II) Pre laryngeal nodes

III) Pre tracheal nodes

All these nodes lie near the midline of the neck. The efferents from all these nodes pass into the deep cervical nodes.

Deep cervical lymphnodes

It lies along the carotid sheath from the base of the skull to the root of the neck. They are subdivided into

I) Superior group

II) Inferior group.

i Superior group: It lies close to the upper part of thq internal jugular vein hidden by the sternocleidomastoid. Out of this one group with one large and several small lies in the triangular area bounded by the posterior belly of digastric, the facial vein and the internal jugular vein and is termed as the jugulodigastric group.

ii Inferior group: It is situated under cover of lower part of sternocleidomastoid and also extends into the subclavian triangle where they are closely related to brachial plexus and subclavian vessels. One node of this lies near the intermediate tendon of omohyoid and is called the jugulo omohyoid lymphnode.

STRUCTURAL ANATOMY OF A LYMPHNODE

Lymphnodes vary in size of a few millimeter to a centimeter and are interspersed throughout the course of capillary network. They are encapsulated and are oval or bean shaped with an indentation along the concave surface. The efferent lymphatic pierce the capsule on the concave surface.

A lymphnode consists of framework of capsule, trabeculae, reticular tissues and cells are contained in this framework.

Capsule: The capsule of the node is surrounded by connective tissue and fat. From the capsule, trabeculae extend into the node, wherein they become continuous with reticulum that forms the supporting framework for the lymphoid tissue.

Afferent lymphatic vessels course in the connective tissue around the capsule. At intervals these pierce the capsule to enter into the marginal sinus. From it, trabecular sinuses ex-,and along the trabeculae into the medulla to pass into medullary sinus. At the upper right of the node is its hilus. In the hilus are efferent lymphatic vessels which drain lymph from the node, small arteries and veins.

Reticulum: It is fibrocelluar meshwork in the cortex. The reticular fibres consist of tiny collagen fibers embedded in amorphous protein polysacharide matrix.

Cells: The enlarged cells are mostly lymphocytes, some macrophages and plasma cells.

In cortex- the cells are very densly packed and may form isolated masses called as lymphatic follicles.

Central part of each follicle is composed of cells which are larger and these areas are called germinal centers. The stem cells from which lymphoblasts arise are primitive reticular cells of node.

The lymphnode has two important functions.

1 Production of lymphocytes and antibodies. As lymph passes through the nodes from lymphocytes, globulin is added.

2 They act as effective filters and barriers for lymph draining through the node.

CYTOLOGY PICTURE:

Normal lymphnode is not palpable but in postmortem lymphnode, studies have revealed that the aspirate from these lymphnodes is highly cellular with area of lymphoid aggregates, the cells are usually small lymphocytes, and lymphocytes and a few plasma cells-scattered or present within as aggregates.

CLASSIFICATION OF LYMPHADENOPATHY

The lymphadenopathy can be generally classified as following.

1) Lymphadenopathy due to primary immune response Infection -

I). Bacterial - Furuncle caused by Staphylococci.

Salmonella septicaemia

II) Viral, Rickettesial and Parasitic infections.

a. Local enlargement of nodes, draining portal of entry of infection

- Cat Scratch fever.
- Lymphogranuloma venerum

b. Generalized lymphadenopathy with systemic infection

- Infectious mononucleosis
- Measles
- Infective hepatitis
- Malaria

c. Miscellaneous type

- Cryptococcosis

- Secondary syphilis
- Toxoplasmosis

2. Lyriphadenopathy primary due to infection of the node by organism.

- Pyogenic infection
- Granuloma formation

3. Neoplastic evolution

a) Primary neoplastic disease of nodes.

- Hodgkins disease and Non
- Hodgkins lymphoma.
- Lymphoid leukaemia.
- Lymphoepithelioma.
- Burkitt's lymphoma.

b) Secondary neoplastic process occurring in nodes

- Myeloid leukaemias
- Metastasis from carcinoma or sarcoma producing lymphnode enlargement.

4) Disease of unknown cause leading to lymphnode enlargement a) Autoimmune disease

- Systemic sclerosis
- Systemic lupus erythematosis
- Rheumatoid arthritis
- Poly arteritis nodosa
- Chronic active hepatitis

b) Reaction to drugs and other chemicals (Pseudolymphomatous Lymphadenopathy)

- Hydantoin and related chemicals.
- Post vaccinal lymphadenopathy
- Sinus histocytosis

c) Miscellaneous diseases

- Reactive hyperplasia
- Hyperthyroidism
- Hypoadrenocortism

5) Metabolic diseases

- Hand schuller christian disease.
- Eosinophilic granuloma

6) Non specific aortitis with lymphadenopathy.

Differential diagnosis of lymphadenopathy according to age factor.

Infants and children

a) Inflammatory
b) Associated with exanthematous fever.
c) Tuberculosis

Youth and adolescents

a) Tuberculosis
b) Lymphomas
c) Lymphosarcoma

Middle age and elderly

a) Malignancy Presenting as: Metastasis from larynx, Nasopharynx, thyroid, other structures in the head and neck

b) Acute inflammatory conditions.

AETIOPATHOLOGY OF CERVICAL LYMPHADENOPATHY

Cervical lymphadenopathy presenting and being diagnosed with help of fine needle aspiration cytology commonly presents in our hospitals as following different entities.

1) Acute lymphadenopathy

2) Chronic non specific lymphadenopathy

3) Tubercular lymphadenopathy.

4) Syphilitic lymphadenopathy.

5) Metastatic lymphadenopathy.

6) Lymphomas - Hodgkins and Non Hodgkins.

7) Lymphatic leukemia associated with lymphadenopathy

8) Reactive lymphadenopathy.

9) HIV induced lymphadenopathy.

The aetiology of the above is discussed in brief ahead.

Aetiopathology of Cervical lymphadenopathy Acute lymphadenopathy:

Acute inflammation of lymph nodes are most commonly caused by direct microbiological invasion and these are usually associated with infection in the area of the drainage of the lymphnode. The nodes become swollen, red and are tender to touch there is a perinodal inflammation of the lymphnode (Stansfeld A.G)

Some of the organisms are listed below

1) Pyogenic organisms	i) Streptococci
	ii) Staphylococci
2) Non Pyogenic	i) Viruses
	ii) Spirochaetes
	iii) Rickettsiae

There are two modes of spread.

a) Suppuration in the nodes by pyogenic organisms in the area of infection,

b) Diffuse reticulo-endothelial hyperplasia, oedema and leukocyte infiltration.

Histologically: There are reactive follicles, histiocytes with particulate debris are seen. When cause is pyogenic, there is necrosis and dense neutrophilic infiltration seen.

Cytology: On aspiration frank pus is seen and microscopic examination reveals areas of necrosis, sheets of polymorphs phagocytic histiocytes (Linsk and Franzen 1983). It is also desirable to know about the organisms hence culture of the same material should also be done (Layfield et al 1985). The organisms that are isolated can be aerobic, anaerobic or even fungal.

Treatment: These lymphnode swelling subside after putting the patient on appropriate antibiotics (Das S).

Chronic lymphadenopathy:

It is much less a precise concept without any sharp distinction from reactive hyperplasia.

It is presenting in addition to reactive hyperplasia, there is scarring which has resulted from tissue destruction. The pattern of change is variable. It presents either as specific or nonspecific chronic lymphadenopathy.

Chronic nonspecific lymphadenopathy:

Chronic nonspecific lymphadenopathy occurs following the chronic inflammation of the area drained by the lymphnodes. In case of cervical lymphadenopathy it occurs following chronic infection of the oropharynx, laryngopharynx and nasopharynx along with the infection of the scalp.

The nodes present to be moderately enlarged, firm and homogenous. The causative organism is streptococcus viridans. The infection spreads through lymphatics to the lymphnodes as a consequence of this, the lymphnode gets enlarged and remains enlarged due to poor resistance and low grade infection.

Cytology: The picture of cytology is characterised by monocyte and phagocytes, lymphoid follicles being hypertrophied with large reactive centers. Lymph sinus contains mainly desquamated macrophages. Diffuse fibrosis may be seen in long standing cases.

Macroscopically : Lymphnodes are smaller, non matted and homogenous on cut section.

Treatment:

Appropriate antibiotics should be given

Chronic specific lymphadenopathy:

This is caused by chronic infection which can be caused by different organisms and give rise to specific type of lymphadenopathies.

1. Tubercular lymphadenopthy.

2. Syphilitic lymphadenopathy.

Other causes can be by sarcoidosis, toxoplasmosis, infectious mononucleosis, cat scratch disease.

Tubercular lymphadenopathy:

It is commonly seen in children and in young adults the source of infection can be

1. Droplet spread

2. Through infected milk.

3. Rarely through the skin.

The method of spread can occur by

1. Direct extension.
2. By lymphatics.
3. By blood stream.
4. Natural passage.

Stages of infection:

From the tonsillar portal of entry the infection spreads by lymphatic to the nearest lymphnode. If the disease spreads, various lymphnodes are involved. They coalesce and breakdown to form caseous tubercular pus, which may in turn perforate the deep facia and present as a fluctuant swelling on the surface known as " collarstud abscess". The skin gradually becomes indurated, breakdown and forms a sinus which if ignored will remain unhealed for years.

From each of these stages resolution can occur and calcification takes place (if caseation has occurred) and a lot of scarring will be seen (if the sinuses are formed).

Cytology: The cytomorphological features are essentially similar- Caseous necrosis, a finely granular necrosis, epitheloid cells which are seen in isolation in clusters. They form ill-defined to well defined granulomas. Giant cells are seen in the cytology picture. They are typical langerhans cells and other multinucleated ones, lymphocytes and presence of associated inflammatory cells such as neutrophils and plasma cells. Occasional calcific material have also been described. The above features may present in various combinations.

A positive diagnosis is achieved by additional bacteriological studies on the aspirate. This includes the staining for acid fast bacilli by any of the special staining techniques. Cultures can also be done and there are different studies about the diagnostic accuracy of fine needle aspiration cytology in tuberculosis. Study by Bloch (1967) shows that 8 out of 10 cases were diagnosed correctly as compared to Histopathological reporting giving his series a 80% diagnostic accuracy. He pointed that in those where there is no caseous material that is in granulomatous type, it is difficult to diagnose. In such cases investigations for acid fast bacilli could be done.

In 1987 Rajvanshi et al gave the study of fine needle aspiration of all sites and found granulomatous reaction with or without caseous necrosis in 83% of cases and cellular or predominant necrotic material in 17% of cases. Overall AFB positivity by Zeihl-Neilson stain on aspirates was 90.6%.

Bacteriology of tubercular bacilli:

They are non sporing rod shaped organisms 1.2 to 4p in length and 0.25 to 0.5p in breadth. They are strictly parasitic organisms and are gram positive and they are acid fast bacilli.

They are aerobes and prefer to grow in generous supply of oxygen. They are resistant to acids and hence resist gastric juices. They produce endotoxin called as tuberculin, containing the disintegrated products of tubercular bacillus.

Syphilitic lymphadenopathy:

The disease syphilis is caused by spirochaete - Treponema pallidum.

This organism is known to penetrate the mucous membrane but not the skin. The organisms then invade the perivascular lymph spaces and multiply and enter the regional lymphatics and blood vessels. The nodal involvement can occur in this disease in primary, secondary and tertiary stage.

But this condition is usually seen to occur commonly in secondary stage and presents as a generalized lymphadenopathy. Subcutaneous nodes are enlarged and are bilaterally symmetrical, discrete, shotty, painless. The commonly involved lymphnodes in cervical region are posterior and occipital group. There is never a suppurative stage in this disease. In later stages the lymphnodes may soften and form sinuses. In congenital type the usual lymphnodes which may be involved are cervical and the inguinal group.

Cytology : Prominent proliferation of mononuclear cells, lymphocytes and plasma cells along with abundant spirochaetes are seen in background illumination microscopy.

The serological and the Treponema pallidum immobilization (TPI) test is positive

Metastatic lymphadenopathy:

Secondary involvement of lymphnodes in cervical region is very common. The carcinoma tends to metastasize to regional lymphnodes. The malignant cells get blocked up in the lymphnodes and get enlarged. It is seen in 60 to 70% of people having carcinoma of head and neck. Specially it is infact diagnostic for a patients to have cervical lymphnodes in case carcinoma of pyriform fossa as the first presenting symptom.

Nodal swelling may be unilateral or bilateral. We can also get nodes without any primary site and this is called occult primary.

The nodes are first mobile and firm but later become hard and get matted together. The overlying skin can become ulcerated and it is usually painless and free of tenderness.

A thorough ENT examination should be carried out to find out the primary site including thyroid and the salivary gland. Investigations like barium swallow, X-ray chest and endoscopy of upper GIT and direct laryngoscopy should be carried out. If the primary site is not confirmed then the patient can be sent for radiotherapy.

Cytology: The different diagnostic features for diagnosis of metastatic lymphadenopathy are

1. The foreign cells are seen amongst normal lymphoid cells. At times the whole lymphnode is replaced by metastatic deposits.
2. The following indicators will suggest the primary site.

a) Squamous cell carcinoma.

i) More prone to liquefactive necrosis.

ii) Squamous cell features (depending upon the differentiation of the tumours) are spindling, distinct cell outline and intracellular keratin

(red) material.

b) Adenocarcinoma.

i Non mucous secreting malignant cells forming sheets, acini and papillary, are seen in billiary tract tumour.

ii Columnar cells forming glands, acini and mucous secretion suggest gastric carcinoma.

iii Clumps and sheets of mucous or non mucous secreting cells with moderate degree of glandular differentiation and prominent nuclear pleomorphism suggest pancreatic or pulmonary tumours.

iv Uniform glandular cells forming gland in gland or cribriform pattern suggest biliary tract carcinoma.

v Cystic lymphnode with large number of macrophages and few groups or tips of papillae comprising of atypical epithelial cells are suggestive of papillary cyst-adenocarcinoma of thyroid.

c) Small cell papillary carcinoma demonstrating dense aggregates single files of cells with prominent nuclear mouldings and nuclear debris, suggests primary in lung or rarely in biliary tract carcinoma.

d) Total dissociation of cells, distinct cell outline, binucleated and multinucleated cells, prominent anisokaryosis and uniformly dense chromatin suggest malignant melanoma.

Staging of secondaries in the neck (As per American Joint Committee on Cancer 1988 - A.J.C.C.).

Clinical staging of cervical metastasis is important from the point of view of management and prognosis.

TNM classification of regional nodes:

Nx - Regional lymph nodes can not be assessed

No - No regional lymph node metastasis

Ni - Metastasis in single ipsilateral lymph node 3cms or less in the greatest diameter.

N2 - Metastasis in a single ipsilateral lymph node. More than 3cms but not more than 6cms greatest or in multiple ipsilateral lymph nodes none more than 6cms in greatest dimension.

N2a - Metastasis in a single ipsilateral lymph node more than 3cms but not more than 6cms in greatest dimension.

N2b-Metastasis in multiple ipsilateral lymph nodes none more than 6cms in greatest dimension.

N2r _ Metastasis in bilateral or contralateral lymph nodes none more than 6cms in greatest dimension.

N3 - Metastasis in a lymph node more than 6cms in greatest dimension.

Lymphomas

This is group of disease characterized by wide spread tumour like enlargement of lymphoid tissue ending fatally.

Etiology : There is no definite etiology found until now regarding this disease but the two etiologies which hold strong are

1. Viral Epstein barr virus can be put to be the cause for lymphomas
2. immunodeficiency – some say that it is characterized by some type of immunodeficiency

Occupational and familial factors are also taken as causative factor.

It is characterized with spleenomegaly and hepatomegaly. Cervical chain of groups are involved in 30% to 40% of cases. The lymphnodes are enlarged to a size of 10cm.

There are two different types of lymphomas

1) Hodgkins lymphoma

2) Non hodgkins lymphoma

1) Hodgkins lymphoma

It is a malignant neoplasm of reticulum cells of lymphoid tissue and is commonest of malignant lymphomas. Where ever there is lymphoid tissue hodgkins disease occurs.

Histological classification.

a) Paragranuloma

b) Granuloma

1) Lymphocyte predominant - stage 1- good prognosis
2) Nodular sclerosis - good prognosis if stage 1
3) Mixed type - changing disease
4) Lymphocyte depleted - stage 3,4 - poor prognosis

C) Sarcoma

Clinical features:

It is seen to be more in male then in females. Generally seen in the age group of 25 to 40 years. It presents as painless lymphnode enlargement with malaise, fever, weight loss or pruritis. Bone pain especially spinal indicates vertebral collapse due to metastasis.

On examination : Seen as discrete, non tender, rubbery lymphnodes. Hepatomegaly and spleenomegaly is also associated with fever. As the disease advances the bone metastasis causes anaemia and pancytopenia. Jaundice can also be seen in patients due to haemolysis of red blood cells.

Investigations for staging

1. Excision biopsy for achieving the type of disease.
2. X-ray chest for enlargement of mediastinal nodes and metastasis to vertebra.
3. Mediastinal scanning with Gallium 67 to demonstrate involvement of mediastinal lymphnodes.
4. Intravenous urographs to show distortion or compression of renal calyces by retroperitoneal lymphnodes.

Cytology

Picture shows pleomorphism and proliferation of reticulo endothelial cells are essential features. Other features are appearance of cells called as Reed-Sternberg cells, which has got two neclei which are mirror image of each other.

Lymphatic leukemia

The following factors are believed to cause lymphatic leukemia.

1. Irradiation : Leukemia is found 8 times more in radiologist than in others. Another is that it is seen more in those people who are staying in areas which have nuclear irradiation. Foetus of mother having exposed to radiation has chances of having the disease.
2. Chemical induction: Certain chemicals like benzene are found to cause acute myeloid leukemia. Drugs like phenylbutazone and chloramphenicol cause bone marrow aplasia and this favours leukemia.
3. Role of virus is very negligible.
4. Generic factors are not heard of much but it has been seen in monozygous twins.

Pathology: Average WBC total count is 50,000 to 1,00,000 out of which 99% may be lymphoid cells. Most of them are small lymphocytes. Lymphnodes are enlarged along with hepatosplenomegaly. Bone marrow is infiltrated by lymphatic tissue replacing erythropoetic tisuue.

Cytology; The lymphnode infiltration by chronic myeloid leukaemia and acute lymphoblastic leukaemias have been diagnosed from aspirates. Both the group of cases are confirmed on peripheral smears and bone marrow aspirates. Immature

myeloid series of cells in lymphnode aspirate are present in extramedullary hematopoeisis, in addition to CML. Aspirates from lymphnode, infiltrated by ALL, will show clumped cells of intermediate size with fragile cytoplasm and normal lymphoid series of cells in the background.

Reactive lymphadenopathy:

This entity is either a response to an inflammatory or a neoplastic tissue into which the lymph drains. The node is thus firm in consistency and mildly enlarged in size and freely mobile.

A reactive lymphnode consists of mixed population of lymphocytes with predominance of small lymphocytes, variable number of centroblasts, centrocytes, plasma cells and immunoblasts are seen along wit dendritic reticulam cells.

Scattered histiocytes with intracytoplasmic nuclear debris (tingible body macrophages), pale histiocytes and acute inflammatory cells are seen.

AIDS associated lymphadenopathy:

In the patient of acquired immunodeficiency syndrome there have been found to present with lymphnode enlargement at various sites like inguinal, cervical, femoral and para aortic groups.

These lymphnodes present from firm to hard in consistency and are usually mobile and markely enlarged.

On cytology they have been found to show variation from acute suppurative lesions to features of neoplasms. These lymphnodes have been found to be highly positive for the acid fast bacilli, but lack granulomas. Mycobacterium tuberculosis is an important pathogen associated with HIV virus infection. It is estimated that a

hundred fold nsk is seen in these cases. Other entities which can be seen in these patients are fungal infections of the lymphnodes and lymphomas.

Fine Needle Aspiration Cytology (FNAC)

Fine needle aspiration biopsy is the study of cells obtained by small gauge needle, generally with vacuum system provided by air tight syringe. All areas of the body are suitable for this procedure. (Tide S. Kline, Fine needle aspiration biopsy cytology, second edition).

Svante oralle, Gregory, Sterret, Wore Walters, and Darrel Whitaker believe that " FNAC" is an appropriate description of the whole art. The material expressed from the needle is called sample, smear or aspirate. Since the technique involves not only an aspiration, but collection of a fine core microbiopsy, they also accept the commonly used terminology of fine needle aspiration biopsy for the operative procedures.

Indications and Advantages

In 1937, Ferguson, pioneer of prostatic aspirations, wrote: "The only function of aspiration biopsy is to differentiate neoplastic from nonneoplastic tissue". Today this concept still remains the primary goal. There are, however, a number of additional indications for the procedure. These include identification of the tissue constituting the mass (especially in the neck), recovery of specific organisms, and use in research.

Among the advantages of aspiration biopsy which are numerous and which are, therefore, addressed in detail in later chapter, are the following:

1. It usually is an office procedure, necessitating neither patients preparation nor specialized anaesthesia.

2. It eliminates or modifies lengthy periods of " watchful waiting."
3. It is safe and almost painless.
4. Both the procedure and its interpretation may be completed rapidly.
5. Sensitivity and specificity are high.
6. It is cost-effective and ideal for implementation of diagnosis related groups (DRGs).

NAB should be used as part of the initial examination of the patient and, when indicated, should be equal in priority to a chest radiograph or electrocardiogram.

Limitations

Specific limitations of NAB must be understood. Open biopsy must be performed whenever indicated. The two methods are not in opposition to, and may even complement, each other. Limitations lessen as interpretative expertise rises, but still include.

1. An inability to diagnose unusual tumours
2. Difficulty in the classification of neoplasms
3. Inappropriate or insufficient biopsy specimens

These limitations are similar to those encountered with formal biopsy. Sometimes, special studies, such as electron microscopy or immunochemistrv, as well as tissue sections, can be used to establish a specific diagnosis on ABC A problem unique to NAB, however, is the effect of fibrosis on adequate biopsy sampling.

Complications

Few complications result from NAB, and these must be compared with those from incisional or excisional biopsy. Seeding of tumor cells, the most frequently cited limitation of aspiration biopsy, is almost a myth. A handful of cases have been recorded in the thousands of reports from the world literature. Despite the potential danger of dispersal of tumour cells, long term studies indicate scanty risk. Following needle aspiration biopsy, there was no recurrence of tumor along the needle tract during a 10-year study of 157 patients with mixed tumor of the salivary glands or during a 5-year study of 469 patients with prostatic carcinoma treated only with hormones. Moreover, the procedure had no adverse influence on prognosis in a 5-year comparative study of patients with renal carcinoma or in a 15-year study of patients with breast carcinoma.

Morbidity following aspiration biopsy is rare. Martin and Stewart reported no serious complications from 3,500 aspirates and we have observed none after more than 20,000. Indeed, the safety of aspiration biopsy was proven in the large Scandinavian series.

THE PRACTICE OF FNAC:

The debate over who should actually perform the procedure will continue for a long time. Some believe that the pathologist should be protagonist, but in many deeply sited lesions, it is preferable for the surgeon, who has the clinical knowledge about the tumour or radiologist, who controls the various methods of tumour imaging, to direct the needle to the target. No doubt every doctor may succeed in acquiring some material, but to achieve an ideal standard of proficiency, constant daily experience is essential. When the radiologist or surgeon collects materials, it is of

great value for the pathologist or a specially trained technologist to be present at the procedure, to safeguard the quality of preparation.

Diagnosis of FNAC should only be attempted when the pathologist is cognizant of the details of clinical history, physical examination, and the results of other laboratory tests. These will compensate for the shortcomings of the technique in demonstrating less of the architectural arrangement of tissues than do histological sections. If only a few abnormal cells can be found in a population of cells normal for the site, the aspirate in most cases should be regarded as unsatisfactory and the procedure repeated.

There has been a great deal of controversy regarding the advantages and disadvantages of using air-dried May - Grunwald - Giemsa (MGG) stained smears as against wet-fixed Papanicoloau (Pap) and haematoxylin-Eosin (H&E) preparations. Both are complementary, and should be employed because certain features are particularly distinctive in each; familiarity with both stains is indispensabh specific situation.

Patient Selection:

Some principles, which apply to FNACs of all masses, are listed below

1. To be suitable for FNAC, the disease process must be localized and clearly defined by clinical examination or by any available radiological imaging technique.
2. Occasionally, FNAC biopsy can be of value in a diffuse process, the main indication being infection, in which material for microbiological investigation cannot be obtained in any other way.

3. If a diffuse abnormality is suspected to be neoplastic, F14-AC may be tried, but only with the clear understanding that a negative result has no informative value at all.

4. Although severe complications are very rare, the possible benefits and predicated specificity of a cytological diagnosis must always be weighed against the risk. E.g. patients with coagulation disorders or with respiratory failure may not be suitable for aspiration of some sides. Some highly malignant tumours such as melanomas, germ cell tumours of testis, and ovarian cystadenocarcinomas are probably better managed surgically, without preoperative FNAC, if they appear to be localized.

5. Most FNACs can safely be carried out as an office procedure. However, deep aspirations, particularly transperitoneal biopsies, and biopsies of liver and spleen should be carried out in hospitals, so that patients can be kept under observation for a few hours afterwards.

6. Whenever possible, the pathologist should be consulted, the biopsy performed, and should be given all relevant data, without which a diagnosis should not be attempted.

Preparation for Biopsy

Equipments:

1. Needles

Standard disposable 20 - 26 gauge 30 - 50 mm long needles are suitable for most palpable lesions. Finer needles of 25 or 26 gauge can occasionally be used in children and in particularly sensitive areas, such as the orbit, but the yield is significantly sparser. Thicker needles on the whole offer no advantages. They are

prone to cause more bleeding and can become blocked by a plug of tissue, which may not represent the process under investigation, and which is difficult to smear. If the purpose of the biopsy is to obtain a core of tissue for paraffin embedding and sectioning, then a needle of atleast 18 gauge will usually be necessary. However with thick needle, the small but real risk of tumour implantation in the needle tract must be considered, as well as the greater frequency of haemorrhage and other complications. Anaesthesia and stricter sterility also become necessary. 22 gauge, 90mm disposable lumber puncture needles are usually suitable for the sampling of deeper tissues. The needle is sufficiently rigid and the trocar prevents contamination during the passage of the needle through other tissues.

2. Syringes:

Standard disposable plastic syringes, 10 - 20 ml, are used. The syringe must be of good quality, of strong rigid material, and produce a good negative pressure.

3. Syringe holder

The use of a syringe holder is strongly recommended. Leaving one hand free to immobilize the lesion allows for better precision in placing the needle exactly where desired. The original Franzen biopsy syringe (Socores Isba S A, Renens, Switzerland) made of glass and stainless steel is relatively expensive. This should be used only for intra-operative biopsies when all the apparatus must be sterile. For routine use, such commercial products as Cameco syringe pistol (Cameco AB, Tady, Sweden) made to fit either 10 or 20 ml plastic syringes, are recommended; however, a similar, simpler device can be made to order by most hospital engineering workshops.

4. Slides:

Glass slides must be thoroughly cleaned and free of grease. The aspirate can be smeared between two standard microscope slides. However, a 0.4mm haemocytometer coverslip gives much better control

Over the pressure used and a more even spread and' is therefore preferred. Air-dried slides are best transported in a stainless steel slide carrier to avoid contamination and scratching.

5. Fixatives:

For routine wet-fixation of smears, 70-90% ethanol or ether alcohol in equal quantities, conveniently in Coplin jars is preferable to spray fixatives. Carnoy's fixative has the advantage of lysing red blood cells. Glutaraldehyde and 10% buffered formalin should also be available if tissue fragments for electron microscopy or for paraffin embedding are obtained.

Sterile containers:

Small sterile containers with tight lids containing physiological saline or Hank's balanced salt solution be at hand if needles and syringe are to be rinsed to obtain material for culture or for preparation of a cell suspension. Special culture media may be required.

Patient Preparation:

A clear explanation of the procedure will ensure the patient's consent and co-operation. Most patients, including children, readily accept FNAC even when repeated. FNAC is usually most conveniently carried out with the patient lying supine

on an ordinary examination couch. A chair with a headrest may be required for some lesions in the head and neck region.

Sterility: Simple skin disinfectant using pre-packed swabs as for routine injections, is adequate for superficial and some deeper palpable lesions. Anaesthesia: Pre-biopsy sedation is rarely justified, and then only in deep aspirations is very anxious or agitated patients. Atropine is sometimes prescribed in preparation for transpleural biopsy to prevent the unlikely nsk of vasovagal reflex. In some instance FNAC can be coordinated with other operative procedure which require general anaesthesia.

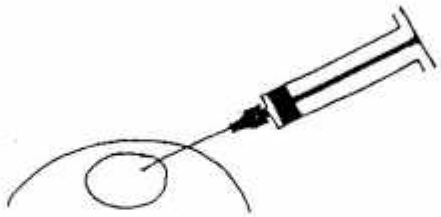
Local anaesthesia is hardly ever necessary when 22 - 23 gauge needles are used. However, although it is just as painful as the biopsy, local anaesthesia should be employed for transpleural, transperiooneal and transperiosteal biopsies. The reason is to prevent uncontrolled movements or jerks by the patient during the procedure; multiple passes are also more acceptable.

THE PROCEDURE OF FINE NEEDLE ASPIRATION CYTOLOGY

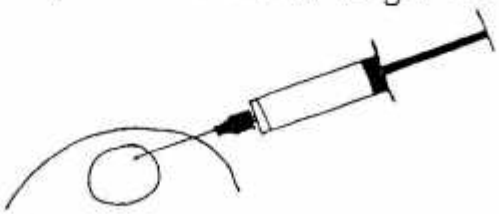
Insertion of the needle:

When aspirating superficial lesions, better control of the needle is achieved by supporting the barrel of the syringe by the free hand. Nearer vertical approaches tend to be less painful and allow better appreciation of depth.

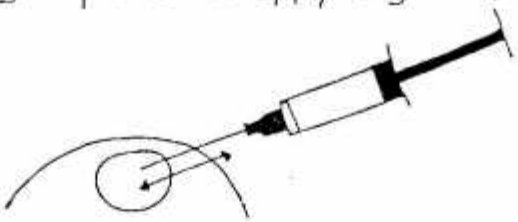
PROCEDURE OF FINE NEEDLE ASPIRATION



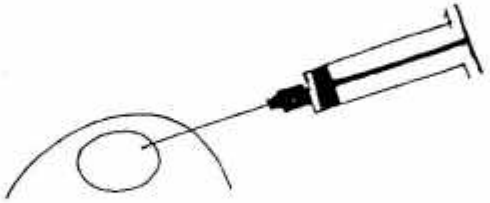
A. Needle positioned within target tissue.



B. Plunger pulled to apply negative pressure

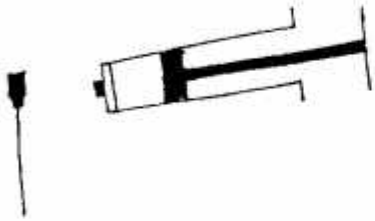


C. Needle moved back & forth within target tissue

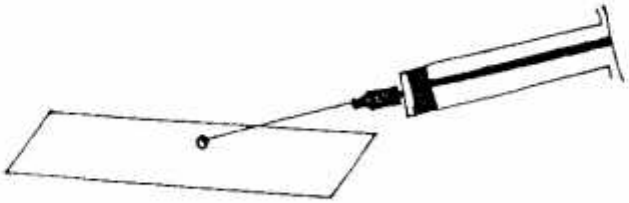


D. Negative pressure released while needle remains in target tissue.

E. Needle withdrawn



F. Needle detached air drawn into syringe



G. ASPIRATE blown onto slide.

The use of radiological tumour imaging techniques to guide deep biopsies may be required. If available, such techniques particularly ultrasonography, are often helpful and time saving, even in the biopsy of palpable lesions, because depth is difficult to assess if the lesion is surrounded by tissues of similar consistency. With practice and experience one will eventually develop a fingertip sensitivity projected to the point of the needle, which, is most cases allows accurate positioning without technical aids.

Aspiration:

The aspiration technique is basically simple. A 22 - 23 Gauge needle is recommended for most FNAC biopsy specimens. Disposable equipment is advised because of its low cost and availability in the office, clinic or hospital. A 10 -20 ml syringe preferably the Luer-lock model, which best maintains a vaccum, is the customary choice.

A sterile needle is attached to the syringe, and guided into the area under study. With vacuum created by retraction of the plunger, the needle is moved back and forth in stabbing motions. This manipulation is especially important for adequate sampling of fibrotic tissue. Negative pressure is maintained until the needle is withdrawn to the subcutis. Two or three samples are optimum for solid lesions. The specimen almost entirely contained within the lumen of the needle is forcibly ejected onto slides, coated with albumin for cellular clarity, or onto dry slides. Detaching the needle to introduce air into the syringe, and then reattaching it to eject more aspirate, enhance cellular expulsion. The aspirate is spread thinly and evenly by a second slide, coverslip or wooden applicator. Fluids are centrifuged and decanted, and the sediment is then smeared on frosted albuminised slides.

The function of the negative pressure is not to tear cells from the tissue, but merely to hold the tissue against the sharp cutting edge of the needle. The softer tissue components protrude over the edge, are cut or scraped off, and accumulate in the lumen as the needle advances through the tissue. Aggregates of tumour cells, glandular and other epithelial structures are softer and more friable than the supporting stroma and are therefore selectively sampled, whereas the stroma is poorly represented in the aspirate. To obtain the greatest possibly yield, the needle should be moved back and forth within the lesion along the same track with negative pressure maintained. This is important in the biopsy of fibrous tissue such as breast, soft tissues and sclerosing tumours, when many passes of the needle may be necessary to sample a satisfactory number of cells. In highly cellular and vascular tissues, such as the spleen, lymph nodes, liver and thyroid, one steady advance of the needle is usually sufficient, while multiple passes and a maintained negative pressure will only increase the amount of blood aspirated. One should never wait to see material entering in to the syringe, except when evacuating a cyst. Fluid or blood in the syringe, usually means that the aspirate will be unsatisfactory. The ideal aspirate has a high cell content a small amount of fluid, a creamy consistency and remains within the n of the needle.

It is important to release the negative pressure before the needle is withdrawn. A maintained negative pressure will draw the aspirate into 6e syringe, which must then be rinsed with fluid to recover the specimen. In addition, the sample may become contaminated by material aspirated during withdrawal of the needle e.g. rectal contents in biopsy of prostate.

After aspiration of superficial lesions, pressure should be applied over the aspirated site, to minimize bruising or to decrease the chance of haematoma formation, particularly in vascular tissues, such as the thyroid.

Failure to obtain representative sample:

The possible reasons for failure to obtain a representative sample

1 If the tumour is narrowly missed, and the needle passes it tangentially, only the adjacent inflammatory reaction is sampled, and an erroneous diagnosis of inflammation may be made.

2 Central necrosis, haemorrhage, or cystic changes are commonly seen in tumors, and if the aspirate is taken from such areas, no diagnostic cells may be found in the smears.

3 Sometimes, a small malignant neoplasm can be masked or hidden by a dominant benign tumour. This situations is not, infrequently seen in the breast and the thyroid, and is one important cause of false negative diagnosis.

Any palpable abnormality persisting, after evacuation of cyst, must of course, be rebiopsied.

Preparing the aspirate:

1. Direct smearing: An aspirate is called "dry" if it consists of numerous cells suspended in a small amount of tissue fluid and has creamy consistency. This represents the perfect sample, obtainable from most malignant tumours.

A "wet" aspirate consists of a smaller number of cells suspended in fluid or blood.

A dry aspirate is best smeared with the flat of a 0.4mm coverslip exerting a light pressure to achieve a reasonably thin, even spread. Too firm smearing pressure produces crush artifacts. It is therefore better to make the smear somewhat thicker than to make it too thin.

Thin smears of dry aspirate dry extremely fast and drying artifacts are a common problem if the smears are wet-fixed

A wet aspirate should be smeared in two steps. The first stet moving the coverslip to the middle of the slide, while holding it at a blunt angle; this leaves most of the fluid behind while the cells follow the

Overslip like a buffy coat. The concentrated cells can then be smeared pith the flat of a coverslip as for dry aspirates.

Good cell preservation depends on rapid drying. If drying is slow, artifacts appear, which may render cytological diagnosis impossible.

If a large amount of blood is aspirated, this can be expressed on to and quickly spread over a watch glass before coagulation occurs. Minimal tissue particles, if present, become visible and can be picked up for direct smearing or be placed with drop of blood, to form a clot suitable for histological processing.

2. Indirect smearing: An aspirate which consists of more than a few drops of thin fluid is best processed by centrifugation. In some laboratories, the standard method of preparation of Fine Needle Aspirates is to rinse needle and syringes with saline or with a fixative, which is then centrifuges or filtered onto slides.

Standardized preparations with optimal preservation of cell and nuclear shape are particularly important in the diagnosis of malignant lymphoma. For lymph node aspirations, a cell suspension should also be prepared, in addition to direct smears. Hank's balanced salt solution with addition of 5 - 10% foetal calf serum is ideal for this purpose. The suspension is gently spun on the centrifuge at 300 rpm. The suspension may have to be diluted further to achieve optimal dispersion of cells on the slide and to avoid clumping.

Fixation and staining

Two fundamentally different methods of fixation and staining are used in FNAC. Air-drying followed by staining with a haematological stain such as May-Grunwald-Gienmsa (MGG). Jener-Giemsa, Wright's stain, or Diff-Quick, and alcohol fixation and staining with Pap or Haematoxylin and Eosin (H & E). Both methods have their advantages and deficiencies, and both should be used, as they are complementary to each other.

In air-drying the cell, both cytoplasm and nucleus, is flattened on the glass surface, and appears larger than a cell fixed in ethanol. Air drying is therefore a helpful phenomenon in cytological diagnosis, as increase in nuclear size is one important criterion of malignancy. Nuclear detail is poorly shown and confusing and artifacts are common, if smears are incorrectly made. However, difficulties can occur also with wet fixation.

The different properties of air-dried Giemsa smear and of alcohol fixed Pap smears are listed in the following tables. It is obvious from the tables that the two methods are complementary. Diff Quick is a rapid haematology type stain (2-3min) which is handy to use in the theatre or radiology department, to check immediately, during the FNAC procedure, that a satisfactory specimen has been obtained. Rapid Heaematoxylin and Eosin and Pap stain are also available. To prevent cross-infection in cases where there is a high level of suspicion of an infective process, it is suggested that air dried smears be sterilized by fixation in methanol soon after drying.

MATERIAL AND METHODS

"Diagnostic efficacy of FNAC in cervical lymphadenopathy"- a one year hospital based cross sectional study. Only those patients who presented with cervical lymphadenopathy and who underwent fine needle aspiration cytology and biopsy procedures along with other necessary investigations were selected for the study. A total of 30 cases were studied.

All the cases were seen in ENT out patient department of K.L.E'S Dr. Prabhakar Kore Hospital & MRC, Belgaum. A detailed history of the patients was taken. A thorough clinical examination including ENT, neck and systemic examination were performed and routine investigations were done.

Inclusion Criteria:

All the patients attending ENT outpatient department with cervical lymphnode enlargement.

Exclusion Criteria

Those with acute inflammatory lesions in the area of the drainage of the node were not be subjected to this study.

Fine needle aspiration cytology was done as an out patient procedure. Depending on the fine needle aspiration cytology report if further investigations were necessary, they were carriedout. Subsequently all patients were subjected to an excision biopsy.

The procedure adopted in all cases were the standard ones, conducted in out patients department itself. The procedure was well explained to the patient. The skin over the area to be aspirated was cleaned thoroughly with iodine and spirit. Using 25

gauge disposable needle, attached to 10ml disposable syringe, the needle was deeply inserted into the mass at the right angle to the skin surface. Once the lesion was entered, a negative pressure was created by retracting the plunger of the syringe. When adequate quality of cellular material was withdrawn into the syringe, the suction was gently released to equalise the pressure. This prevents sucking of the aspirated material into the barrel of the syringe, and loss of material for cytological examination. Then, needle was withdrawn and pressure was applied over the mass and tincture benzoin was applied to the side, where the needle was inserted so as to seal the punctured area. 3-4 excursion were made into the mass, before withdrawal.

Three slides were prepared from aspirate thus drawn, and one was air dried while the other two were fixed in ether or alcohol solution, then smears were made. After giving an hour of time for fixation, the sides were removed labeled appropriately and sent for cytological diagnosis with complete relevant clinical findings and relevant laboratory investigations.

Only patients who underwent biopsy were selected for the study. Results of the study were calculated by using the method of Galen and Gambino, for substantiating the correlation.

$$1.\ \text{Sensitivity} = \frac{TP}{TP+FP} \times 100$$

$$2.\ \text{specificity} = \frac{TN}{TN+FP} \times 100$$

$$3.\ \text{Efficiency} = \frac{TP+TN}{TP+FP+FN+TN} \times 100$$

TP : True positive

TN : True negative

FP : False positive

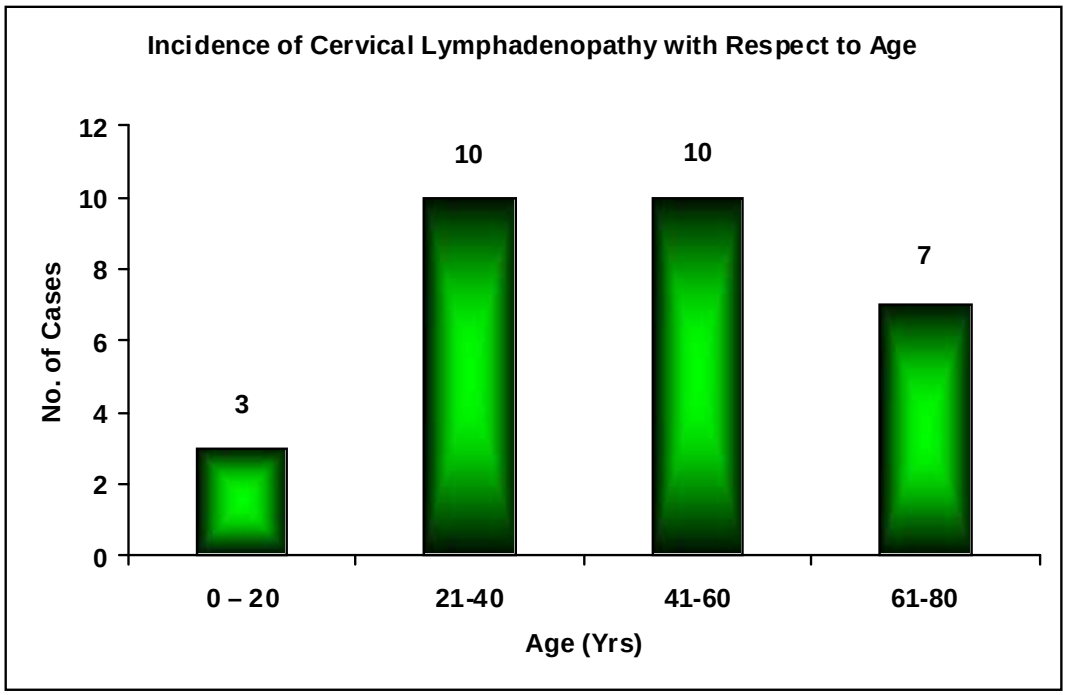
FN : False Negative

The diagnostic accuracy of clinical diagnosis and fine needle aspiration cytology was calculated as the total number of correctly diagnosed cases (when compared to histo-pathology) per 100 cases.

RESULTS

Table 1 : Age Incidence

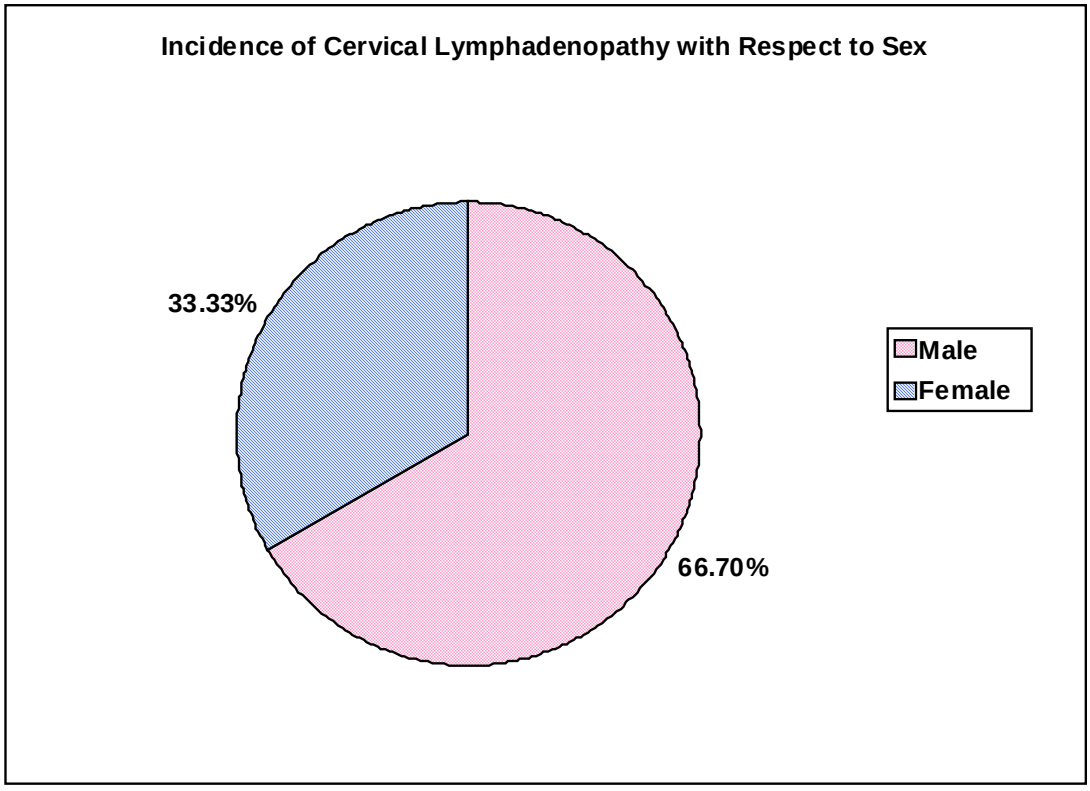
Age (Yrs)	Number of Patients	Percentage
0 – 20	3	10
21-40	10	33.33
41-60	10	33.33
61-80	7	23.33
Total	30	100



The highest incidence of age was in the age group 21-40 (10 cases) and 41-60 years (10 cases) , followed by 61-80 years (7 cases). The lowest incidence of age was in the age group 0-20 (3 cases). The eldest person in the study was a 78 year old man and the youngest was 16 yrs female.

Table No. 2 : Sex incidence

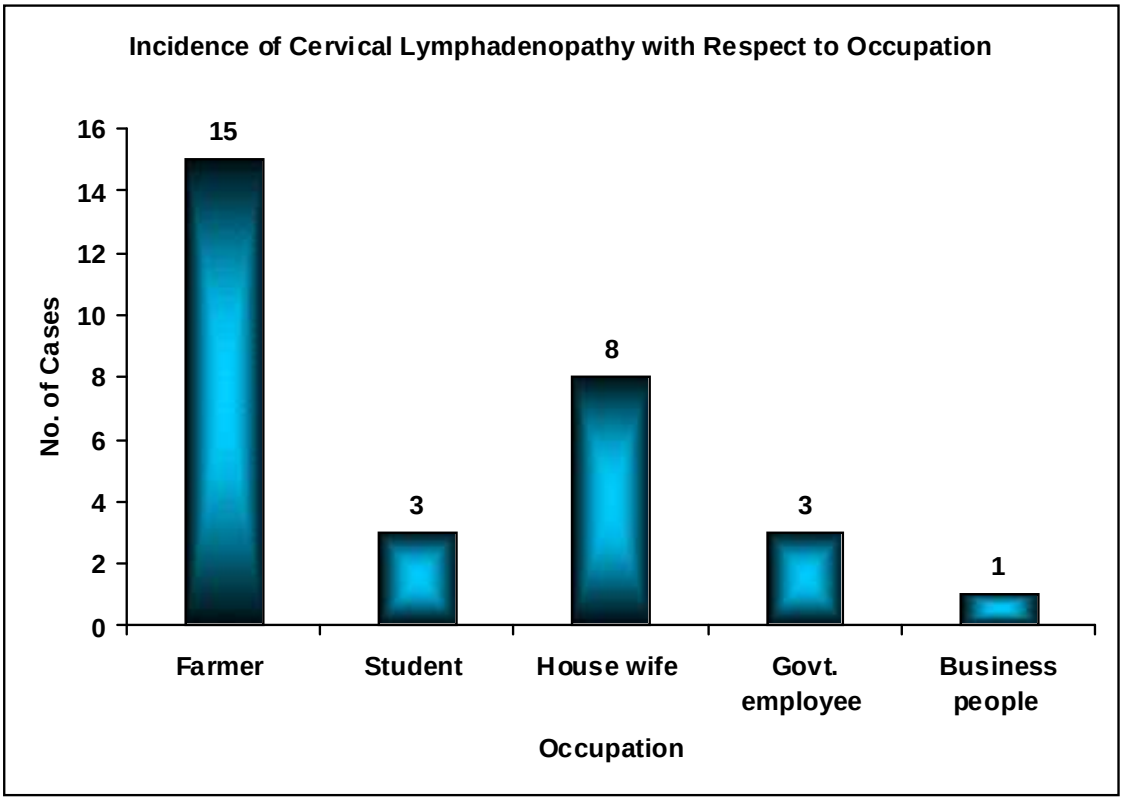
Sex	Number of Patients	Percentage
Male	20	66.7
Female	10	33.33
Total	30	100



The incidence is more in males than females. The number of males being 20 and that of females being 10, the male to female ratio is 2 : 1

Table No. 3 : Occupational incidence

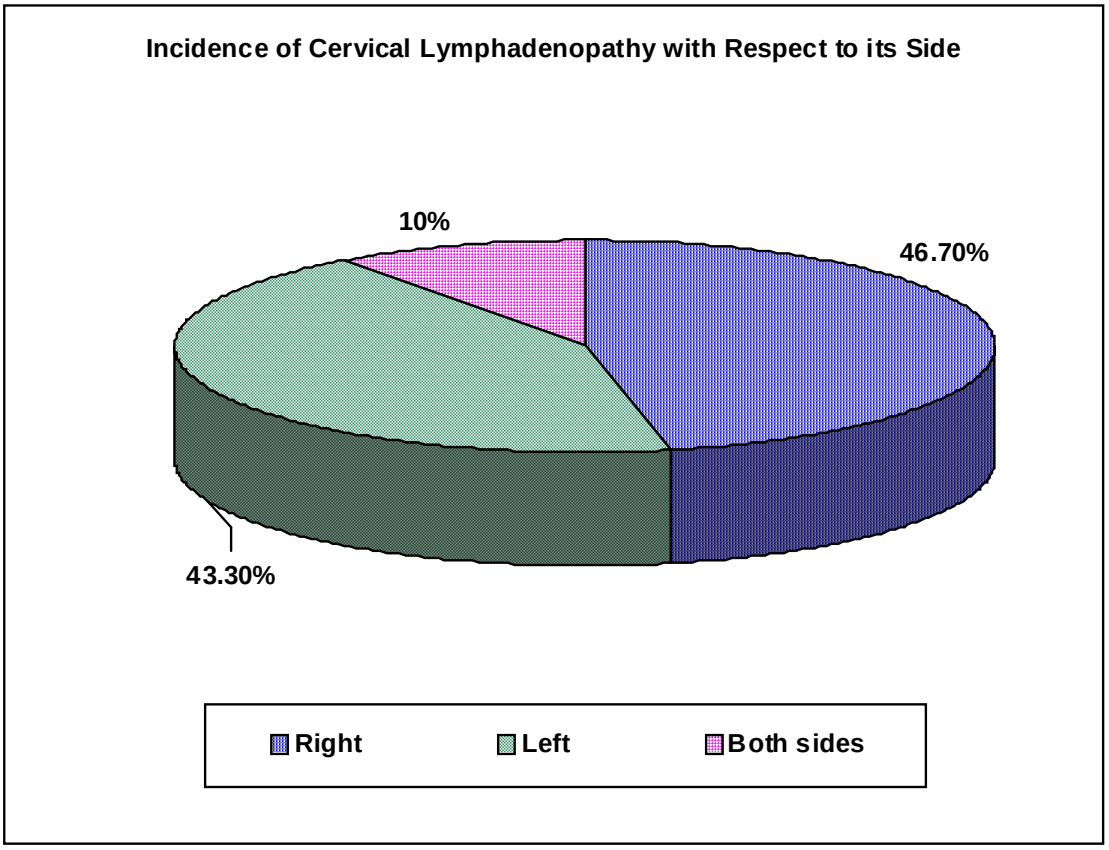
Occupation	Number of Patients	Percentage
Farmer	15	50
Student	3	10
House wife	8	26.66
Govt. employee	3	10
Business people	1	3.33
Total	30	100



Most of the cases of tubercular lymphadenopathy were seen in labourers, farmers and students. Malignancy was common in farmers, labourers and businessman. Chronic non-specific lymphadenopathy was common in students.

Table No. 4 : Side Incidence

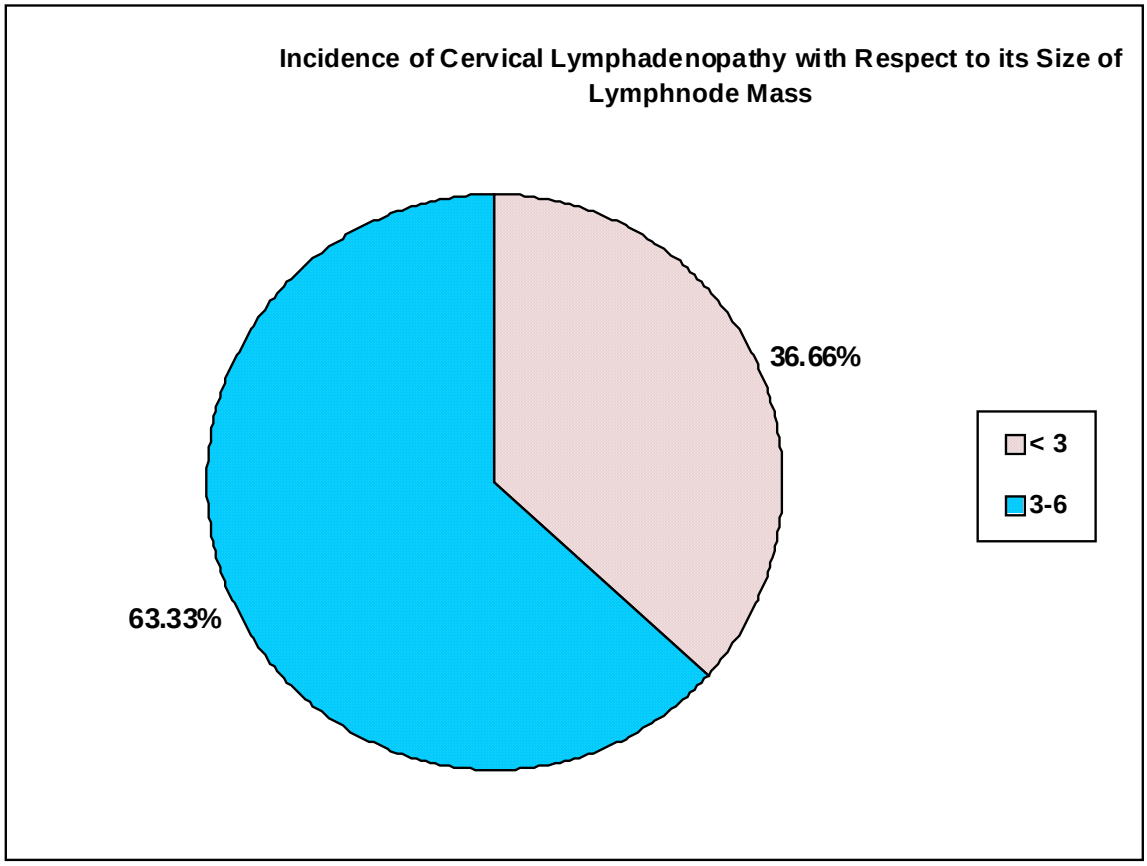
Side involved	Number of Patients	Percentage
Right	14	46.7
Left	13	43.3
Both sides	3	10



The right side was more involved (14 cases) than the left side (13 cases) and very few cases were seen to involve lymphnodes bilaterally.

Table No. 5 : Size Incidence

Size (cms)	Number of Patients	Percentage
< 3	11	36.66
3 - 6	19	63.33
Total	30	100

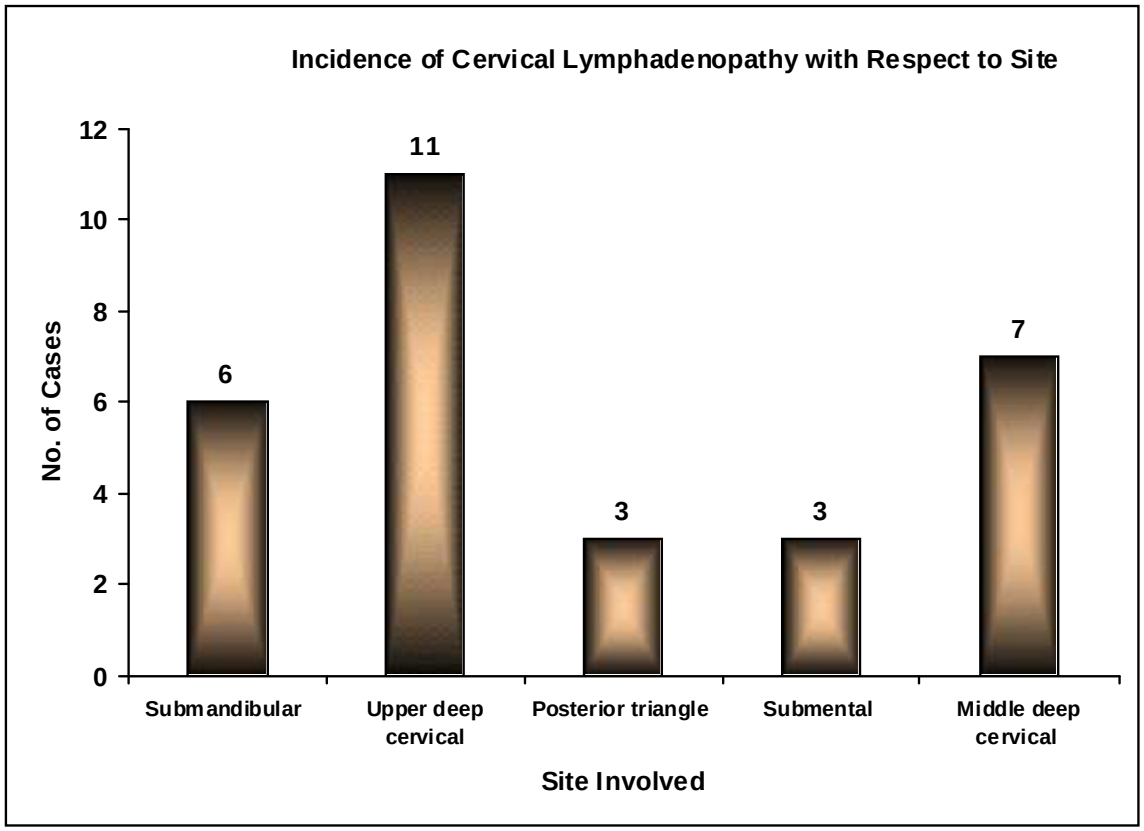


We grouped the size of lymphnodes into two groups. First group was less than 3cms; second group was 3 to 6 cms.

11 cases were in <3 cms, 19 cases were in 3 – 6 cms

Table No. 6 : Site Incidence

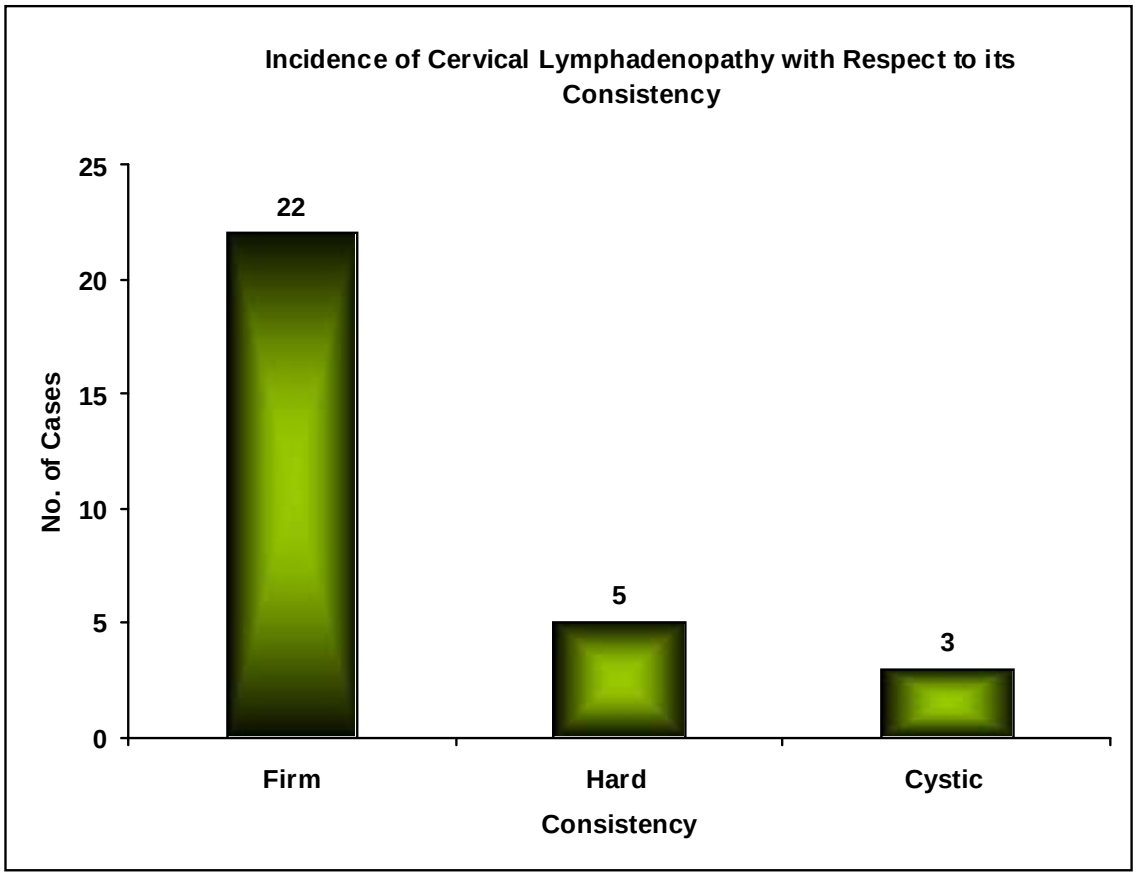
Site involved	Number of Patients	Percentage
Submandibular	6	20
Upper deep cervical	11	36.66
Posterior triangle	3	10
Submental	3	10
Middle deep cervical	7	23.33
Total	30	100



The highest incidence of the site involved was in upper deep cervical (11 cases) and the lowest was in posterior triangle (3 cases) and submental (3 cases).

Table No. 7 : Incidence of consistency

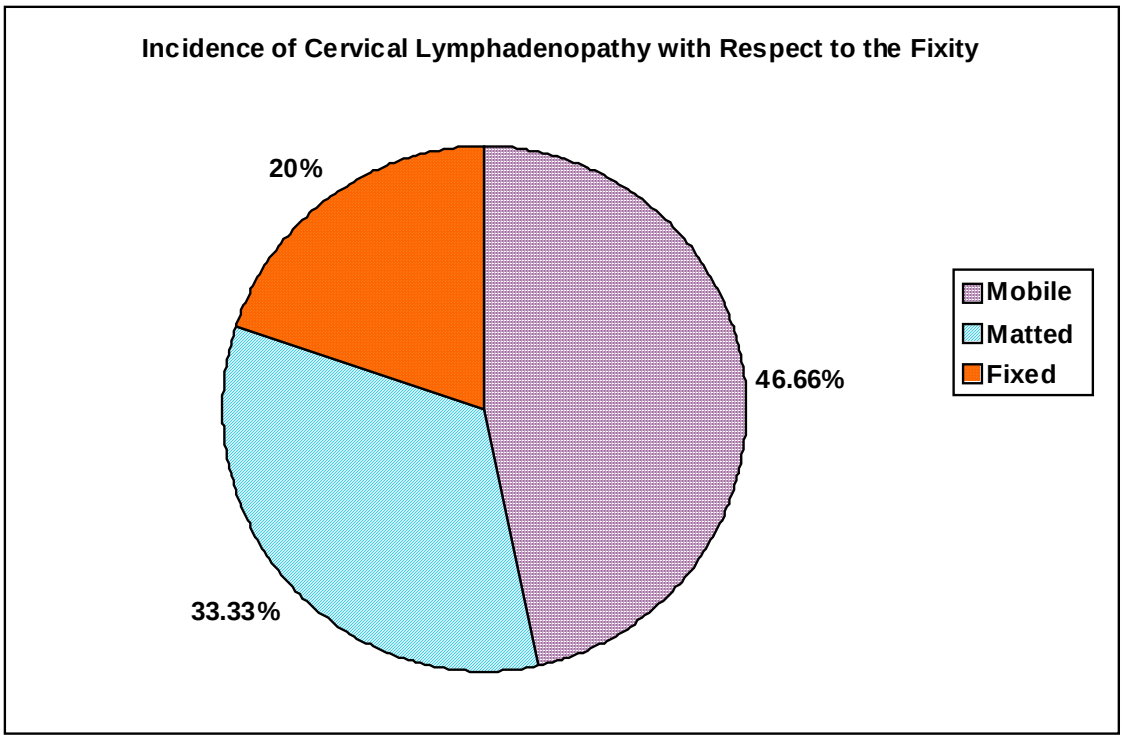
Consistency	Number of Patients	Percentage
Firm	22	73.33
Hard	5	16.66
Cystic	3	10
Total	30	100



Most of the lymphnodes in the present study were firm in consistency (22 cases) and usually were tubercular or chronic non specific. Hard nodes (5 cases) were seen in malignant cases. Soft and cystic (3 cases) were seen in suppurative conditions.

Table No. 8 : Incidence of Fixity

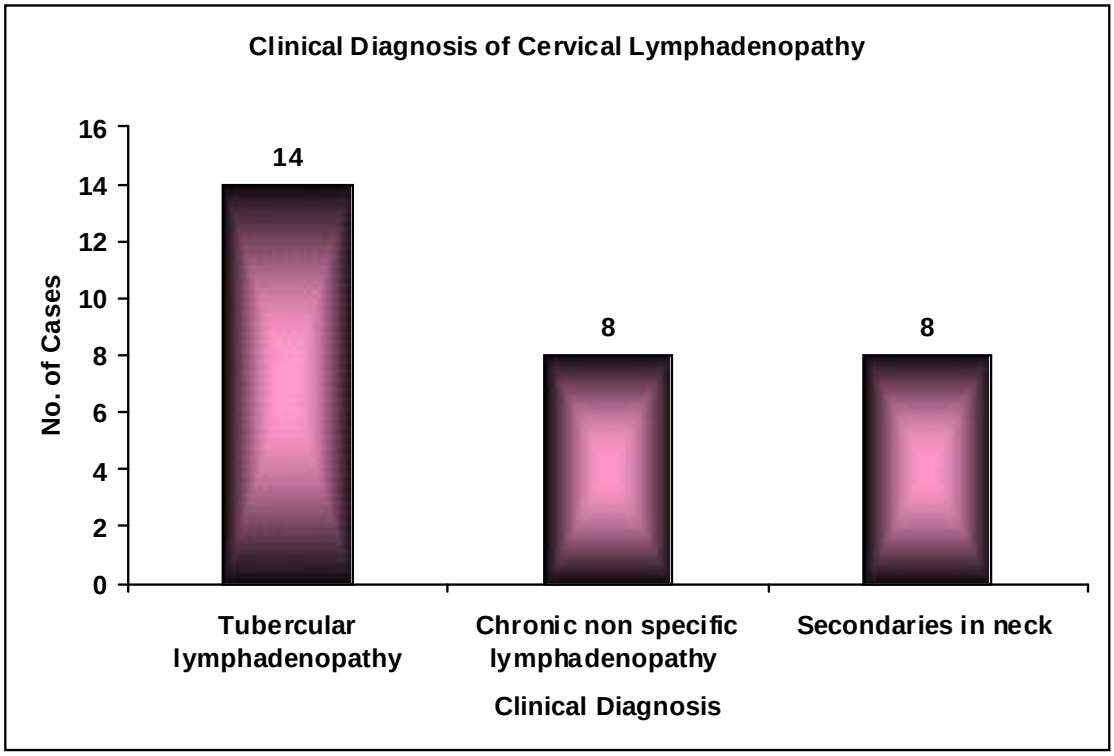
Condition of node	Number of Patients	Percentage
Mobile	14	46.66
Matted	10	33.33
Fixed	6	20
Total	30	100



In the study, fixity was seen in respect to the underlying structures and the skin. Maximum number of lymphnodes (14 cases) were mobile. Matted lymphnodes were seen in 10 cases which were predominantly tubercular lymphadenopathy. Fixed nodes were seen in 6 cases and were mostly malginant cases with secondaries in the neck.

Table No. 9 : Clinical Diagnosis (Clinical Evaluation)

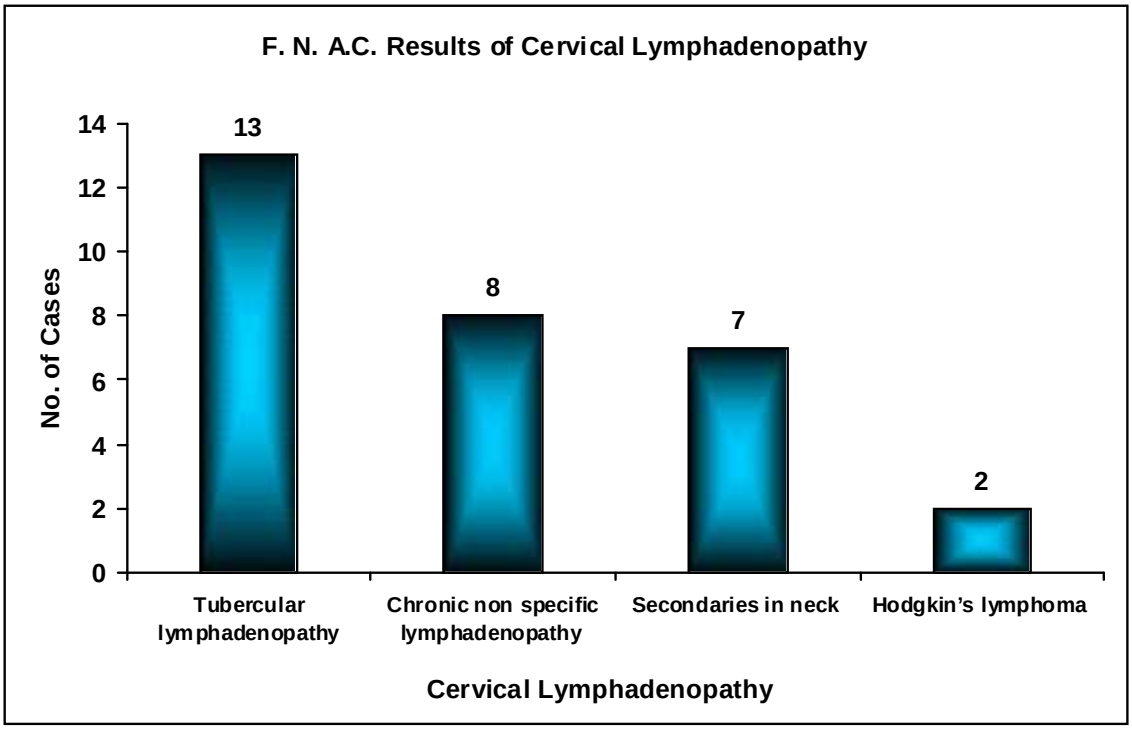
Clinical Diagnosis	Number of Patients	Percentage
Tubercular lymphadenopathy	14	46.66
Chronic non specific lymphadenopathy	8	26.66
Secondaries in neck	8	26.66
Total	30	100



On clinical diagnosis 22 cases constituting 73.33% were found to be benign, of which 14 cases (46.66%) were due to tubercular lymphadenopathy and 08 cases (26.66%) due to non specific lymphodenopathy. Malignancy accounted for 8 cases constituting 26.66%, all these were metastatic lymphnodes.

Table No. 10 : Fine needle aspiration cytology results

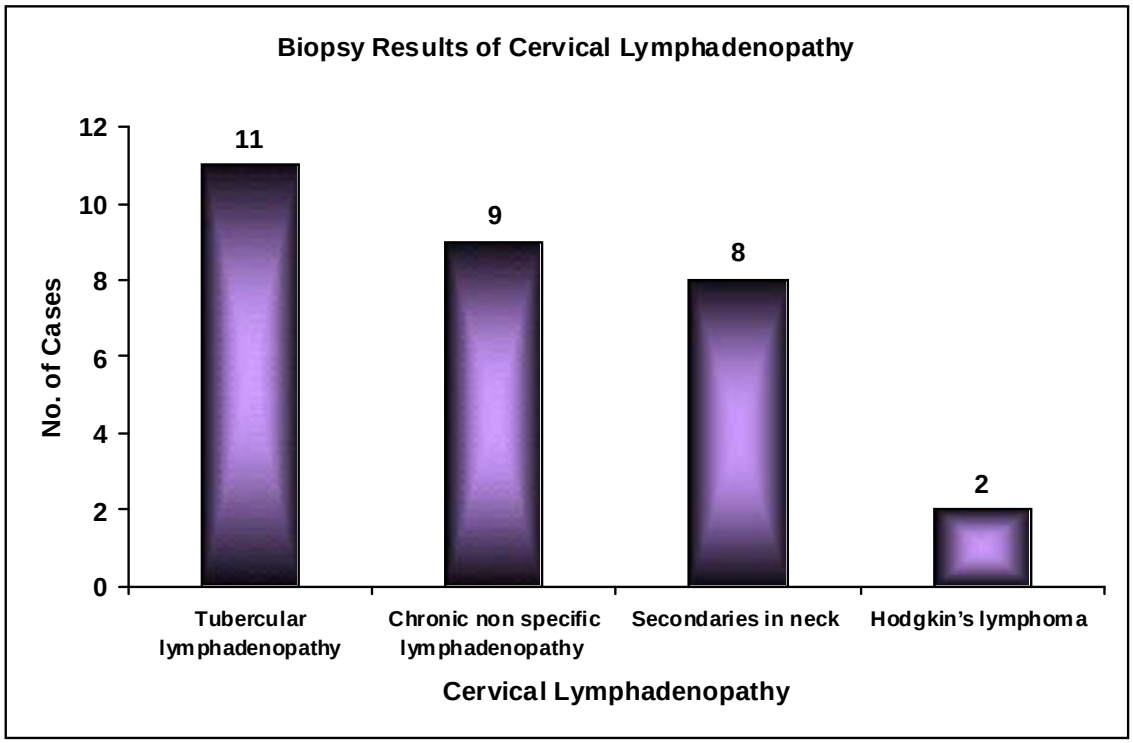
FNAC report	Number of Patients	Percentage
Tubercular lymphadenopathy	13	43.33
Chronic non specific lymphadenopathy	8	26.66
Secondaries in neck	7	23.33
Hodgkin's lymphoma	2	6.66
Total	30	100



Cytological diagnosis by fine needle aspiration cytology showed 21 cases representing 70% to be of benign nature. 13 cases of them were found to be due to tubercular lymphadenopathy and 8 were due to non specific lymphadenopathy. Of the 9 cases of malignancy which accounted for 30%, 7 were secondaries in the neck and 2 were Hodgkin's lymphoma.

Table No. 11 : Biopsy results

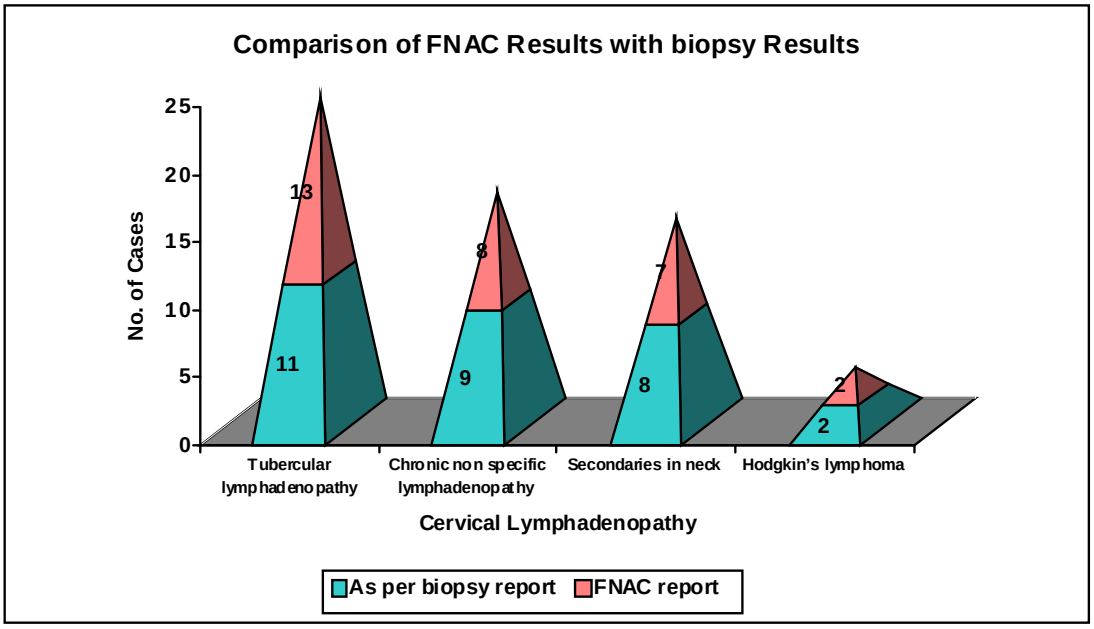
Biopsy report	Number of Patients	Percentage
Tubercular lymphadenopathy	11	36.66
Chronic non specific lymphadenopathy	9	30
Secondaries in neck	8	26.66
Hodgkins lymphoma	2	6.66
Total	30	100



On histopathological examination, tubercular lymphadenopathy (11 cases) constitutes 36.66% and non-specific lymphadenopathy (9 cases) metastatic lymphnodes accounted for 8 and lymphoma 2.

Table No. 12 : Diagnostic Accuracy of FNAC with respect to biopsy

Lymphadenopathy	As per biopsy report	FNAC report	Diagnostic accuracy
Tubercular lymphadenopathy	11	13	84.61
Chronic non specific lymphadenopathy	9	8	88.90
Secondaries in neck	8	7	87.50
Hodgkin's lymphoma	2	2	100
Average	30	30	90.25

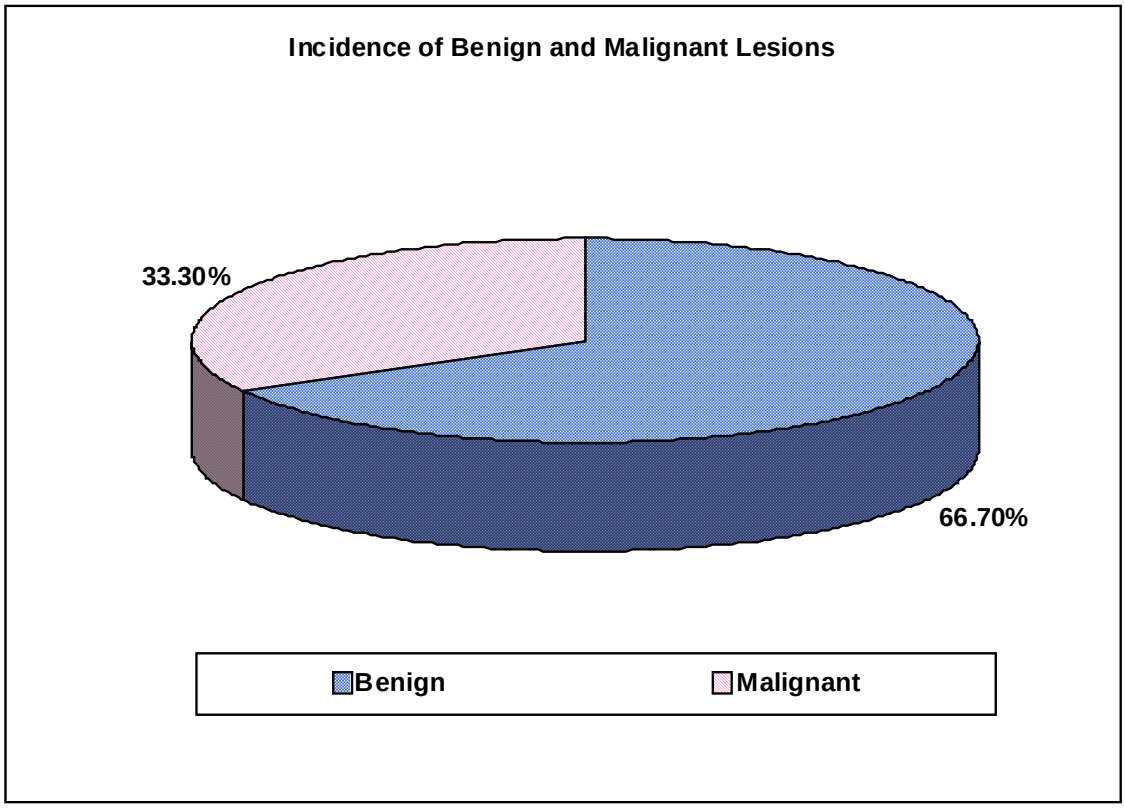


The present study has diagnosed 13 cases of tubercular lymphadenopathy by fine needle aspiration cytology in which 11 cases were proven by biopsy. The diagnostic accuracy of FNAC for tubercular lymphadenopathy is 84.61%. The diagnostic accuracy of FNAC for non-specific lymphadenopathy, secondaries in the neck and lymphoma were 88.90%, 87.50%, 100% respectively.

The overall diagnostic accuracy of FNAC in this study is 90.25%

Table No. 13 : Incidence of Benign and Malignant lesion

Lesions	Number of Patients	Percentage
Benign	20	66.70
Malignant	10	33.33
Total	30	100



Benign lesions were predominant (20 cases) constituting 66.70% of total cases. Malignant lesions constituted 33.30%.(10 out of 30cases).

Table No. 14 : Sensitivity, Specificity and efficiency of FNAC in our study

		Biopsy		
		Malignant	**Benign**	**Total**
FNAC	Malignant	9	0	9
	Benign	1	20	21
	Total	10	20	30

$$\text{Sensitivity} \quad \frac{TP}{TP+FN} \times 100 = \frac{9}{9+1} \times 100 = 90\%$$

$$\text{Specificity} \quad \frac{TN}{TN+FP} \times 100 = \frac{20}{20} \times 100 = 100\%$$

$$\text{Efficiency} \quad \frac{TP + TN}{TP+FP+FN+TN} \times 100 = \frac{9+20}{9+0+1+20} \times 100 = 96.57\%$$

The sensitivity, specificity and efficiency in our study were 90%, 100% and 96.57%.

DISCUSSION

Cervical lymphadenopathy is a common finding seen in routine clinical practice. But this causes less concern to the patient, until it is persistent, generalized or associated with systemic symptoms.

Age Incidence:

As far the age incidence in present series, we had maximum number of patients in age group of 21-40 and 41-60 years with the percentage of 33.33% each, followed by 61-80 years with 23.33% and 0-20 years with 10%.The series by P kumar biswas et al (1996- 2002); depicted 40% incidence in age group of 21-40 years. When we compare to a series of Chamyal P.C, Sabarigirish K, 1997, the incidence was highest in the age group of 41-60 years which was 37.3%. Most of the young cases attributed to tubercular lymphadenopathy and chronic non-specific lymphadenopathy. The number of cases with secondaries in the neck were in the age group of 41-60 and 61-80.

Sex incidence:

The male to female ratio in the present study was 2:1, which was comparable with Aslam et.al(2000) series which was 1.8:1. The cause for more number of male patients can be attributed to the reason that, they have habits like smoking, tobacco chewing and alcohol which attribute to malignancies giving rise to secondaries in the neck.

Occupational incidence and side incidence:

Tubercular lymphadeonopathy was seen commonly in labourers, farmers and students. Malignancy was common in farmers. The right side was more involved than

the left and very few cases were seen to involve bilaterally. This is purely by chance, that how the disease involves the respective lymphnodes.

Size incidence:

The size of the neck nodes in the present series was less than 3cms in 36.66%, between 3 to 6cms was 63.33%. The size of the neck node is important to us, as the staging of the lymphnode usually depends on the size (AJCC Classification). Most of the nodes which were more than 3 cms were usually tubercular and secondaries in the neck. The smaller ones were either malignant or chronic non-specific lymphadenopathy.

Chamyal P.C., Sabarigirish K, (1997) depicted 69.1% nodes were less than 3cms, 20.9% between 3 and 6cms and 10% being more than 6 cms.

Site incidence:

Site of the lymphadenopathy in the present series was again just a matter of how cases presented to us, as they attribute to the areas primarily drained by these lymphnodes. The most commonly found was upper deep cervical area which attributed to 36.66% followed by submandibular glands contributing 20%. The series by Chamyal et al., depicted anterior cervical group which means upper deep cervical as well as the middle and lower deep cervical glands as 65.50%. If we take that into consideration, then our series presents anterior deep cervical as 60%. This area represents more because the smaller group of lymphnodes ultimately drain into the deeper nodes, i.e. anterior group of the anterior triangle of the neck.

Incidence of Consistency:

The consistency of the lymphnodes which presented to us as firm was 73.33%. Hard lymphnodes were seen in 16.66% cases and these were metastatic in origin

which presented as secondaries in the neck. The cystic and soft lymphnodes were felt in suppurative lymphadenopathy which were revealed on fine needle aspiration cytology. 2 of these were AFB positive on Z - N staining. In Chamyal et al series (1997) firm nodes constitutes 65.5%, hard 29.1%, cystic 3.6% and soft 1.8%.

Incidence of fixity:

The mobility and the fixity to underlying structure was evident as 46.66% and 20% respectively. 33.33'% nodes were matted and were characteristic of tubercular lymphadenopathy. All the fixed lymphnodes were secondaries of the neck. In Chamyal P.C, 1997 series mobile were 60.0% while 23.6% were fixed, 16.4% were matted.

Clinical diagnosis:

On clinical diagnosis, 22 cases constituting 73.33% found to be benign, of which 14 were due to tubercular lymphadenopathy and 8 were due to non-specific lymphadenopathy. Malignancy accounted for 8 cases constituting 26.66%. In Chamyal P.C, Sabarigirish K (1997) study, benign lesions constitutes 57.2% and malignancy accounted for 40.9% in their clinical diagnosis.

F.N.A.C. Results:

Cytological diagnosis by fine needle aspiration cytology showed, 70% to be of benign nature. 8 of these found to be nonspecific lymphadenopathy and 13 were due to tuberculosis. Of the 9 cases of malignancy 7 were secondaries in the neck, 2 cases were lymphomas. In other study FNAC results showed 57.3% of benign nature and 40.9% of malignant nature .

Biopsy results:

A total of 11 were reported as tubercular lymphadenopathy (36.66%). A retrospective study done by Shakya G et al from July 2005 to June 2008 at the National Public Health Laboratory, Teku, Katmandu had 114 cases out of total 508 cases which was due to tuberculosis, forming 22.4% of total cases. Gupta A. K et al in 1990 had tubercular lymphadenopathy as the commonest cause for lymphnode masses in their phase-1 study. 56 cases out of 97 cases were due to tuberculosis forming 57.7% of total cases.

As far as incidence of benign and malignant lesions are concerned, we had 20 benign neck masses and 10 malignant neck masses. This is reverse of what is seen in most of the other studies. Peters BR et al in 1989 had 53% benign and 47% malignant neck masses out of total 150 patients. Platt JC et al in 1990 had 54 patients diagnosed as malignant cases. Because most of the studies are from the west and there incidence of infective disease like tuberculosis is quite low and life expectancy is high. It is well known that malignant disease tend to predomintate in old age. These two factors combined together are responsible for high incidence of malignant neck masses in other studies. But studies in Indian set up like that of Pradhan KC et al in 1988, the incidence of benign lesions is higher compared to malignant lesions. In their study Pradhan KC et al had 36 benign and 27 malignant lesions.

Our study included 30 cases of lymphnode swellings in head and neck region. 11 cases (36.66%) of tuberculosis, 9 cases (30%) of non specific lymphadenopathy, 8 cases (26.66%) of metastasis and 2 cases 6.66% of lymphomas were examined histo-pathologically. These results are comparable to the 508 cases of retrospective study done by Shkya G et al from July 2005 to June 2008.

Diagnostic accuracy of FNAC

The diagnostic accuracy of FNAC in our study is 90.25%. Lioe T.F. et al in 1999 got similar results. In their study the diagnostic accuracy was 94.4%. Steel B.L et al in 1995 got a diagnostic accuracy of 96% in their study.

FNAC diagnosed 13 cases as tubercular lymphadenopathy, in which 11 cases were proven by biopsy, contributing to diagnostic accuracy of 84.61%. Dasgupta et al in 1994 got diagnostic accuracy of 84.4% for tubercular lymphadenitis. Singh J.P et al in 1989 got similar results. The diagnostic accuracy in their study was 89.77%

Non specific reactive lymphadenitis was correctly diagnosed in 8 out of 9 cases giving accuracy 88.90%. Debra et al in 1998 and Pradhan K.C et al in 1988 had 100% accuracy.

7 out of 8 cases of secondaries in the neck were correctly diagnosed in our study with 87.50% accuracy. Debra R.T et al in 1998, Narang R.K et al in 1990 and Sarda AX et al in 1990 got accuracy for secondaries in the neck in their study was 100%.

We had 2 cases of lymphoma in our study, all of which were correctly diagnosed, giving diagnostic accuracy of 100% . Debra R.T et al 1998 got similar results. The accuracy for diagnosis of lymphoma in their study was 100%. Daskalopoulou D et al in 1997 got a diagnostic accuracy of 100% for hodgkin's and non-hodgkin's lymphoma which is again similar to our study.

Accuracy, Sensitivity and Specificity of FNAC:

A comparison of various statistical parameters with other similar studies shows favorable comparison of results. The present series of 30 cases had an accuracy, specificity and sensitivity of 90.25%, 100% and 90% respectively in

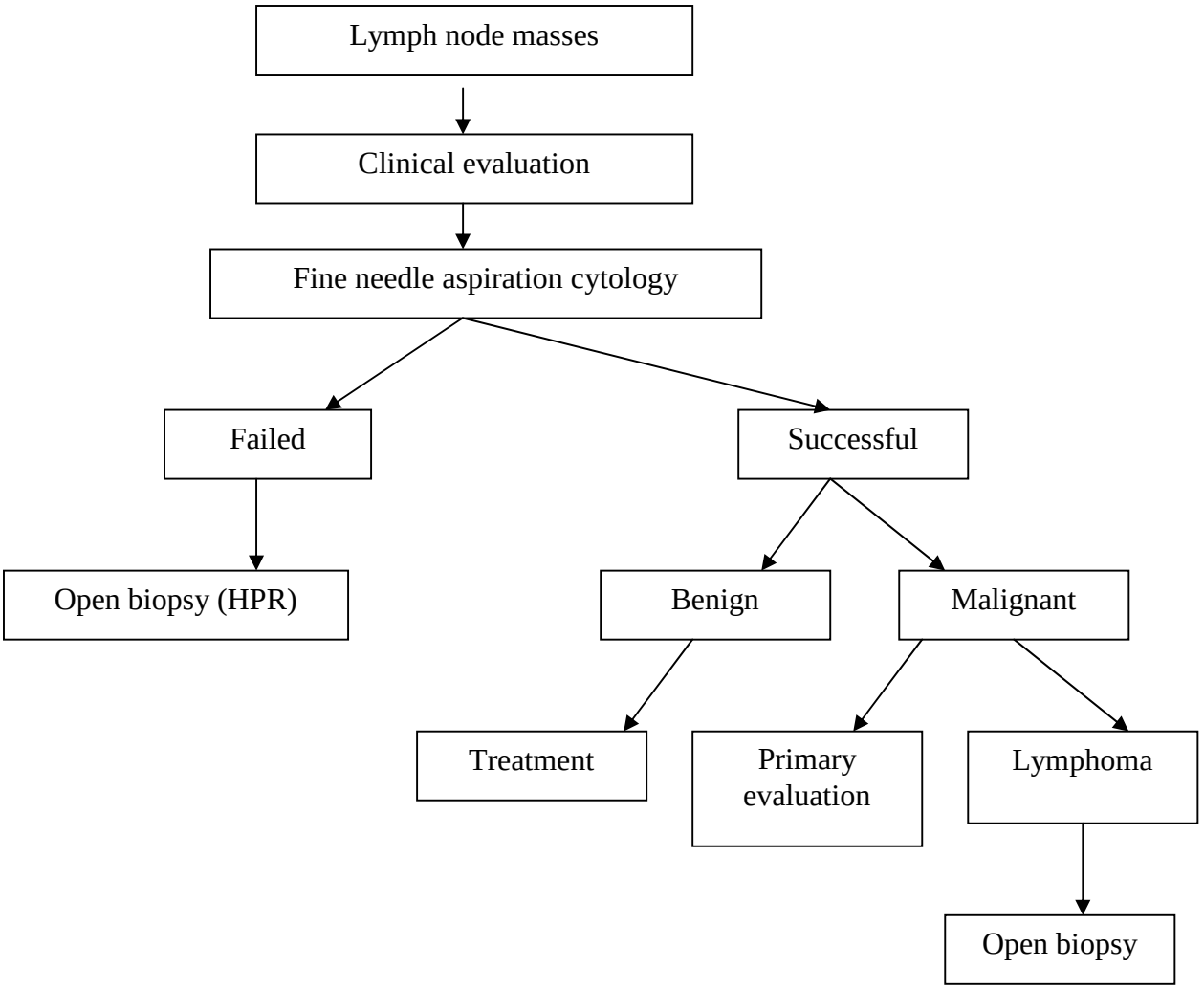
comparison to 97.3%, 99% and 91.6 in a study done by S Shamshad Ahmed et al (2002-2003).The present series is also comparable to a study done by Gupta et al (2003) with a sensitivity and specificity of 92.7%, 98.5% respectively.

Out of 30 patients who underwent FNAC, there was not even a single case which had complication. This shows the safety involved in this procedure.

All the patients were put on appropriate treatment following diagnosis and were followed up. Eighty five percent of the patients were available for follow-up during our study period. All of them improved receiving treatment. Fifteen percent of the patients were not available for follow-up.

The results for the study suggests that, it was worthwhile to evaluate cervical lymphadenopathy with fine needle aspiration cytology as first line of modality and then subject to histopathology reporting, if there is any discrepancy. Histo-pathological examination can be done, if FNAC is non conclusive due to procedure error or diagnostic error. This procedure is emphasized for its reliability, quickness and low cost . This can also be done as an out patient procedure and patient can attend to his daily work. There are also no side effects reported in our study or in any of the literature known best to our knowledge. Apart from this, open biopsy should be served for situations like failed aspiration and lymphomas for confirmation.

A brief protocol can be stated here



SUMMARY AND CONCLUSION

"Diagnostic efficacy of FNAC in cervical lymphadenopathy"- a one year hospital based crosssectional study at KLES Pabhakar Kore Hospital and MRC, Belgaum is carried out which includes 30 cases.

- Cervical lymphadenopathy is a common condition, which presents to ENT out patient department as routine.
- Tuberculosis was a predominant cause for cervical lymphadenopathy in this study and found to be more in lower socio-economic group.
- In younger age group, aspiration cytology can be done easily without subjecting the patient to general anaesthesia. This age group usually presents to us as tubercular lymphadenopathy and non-specific chronic lymphadenopathy.
- In elderly people, cervical lymphadenopathy presented mostly as secondaries in the neck.
- Cervical lymphadenopathy was commonly seen in upper deep cervical middle deep cervical, submandibular, posterior triangle and submental in order of frequency.
- The consistency of lymphondes also specifies or gives an idea of provisional diagnosis, as firm nodes were seen in cases of chronic non-specific lymphadenopathy and tuberculosis, hard nodes were seen in cases of malignancies, whereas, soft and cystic nodes were seen in suppurative lymphadenitis. Fixity of underlying structure and skin is primarily seen in malignant cases with secondaries. Matted nodes were usually seen in tubercular lymphadenopathy.

- The commonest cause of cervical lymphadenopathy in our study was due to tubercular lymphadenitis (11 cases). Others were non-specific lymphadenitis (9 cases), secondaries in neck (8 cases), hodgkin's lymphoma (2 cases).

Cyto-histological correlation :

- In the present study, FNAC diagnosed 13 cases of tubercular lymphadenopathy , in which 11 cases were proven by biopsy, 8 out of 9 cases of nonspecific lymphadenitis, 7 out of 8 cases of secondaries in neck, 2 out of 2 cases in hodgkin's lymphoma. An overall diagnostic accuracy of FNAC in our study was 90.25%, sensistivity and specificity being 90% and 100% respectively.

- The results of this study suggest that, it would be worth while to evaluate histologically all cervical lymphnode masses irrespective of the clinical diagnosis. The choice of histological evaluation rests on aspiration cytology which provides a reliable, quick and cheap method with low failure and complication rates. However, in view of small but insignificant number of false negative results, it must be emphasised that strong clinical suspicion of malignancy should override a negative cytology report and open biopsy should confirm the diagnosis. Apart from this, open biopsy should be reserved for certain specific situation like failed aspiration and lymphoma.

- Our study shows that fine needle aspiration cytology effective in diagnosing various cervical lymphnode masses and also safe, simple, well tolerated, quick, without risk of anaesthesia and surgical intervention.

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ANNEXURE-I

INFORMED CONSENT

"DIAGNOSTIC EFFICACY OF FNAC IN CERVICAL LYMPHADENOPATHY"- A ONE YEAR HOSPITAL BASED CROSS SECTIONAL STUDY

"Diagnostic efficacy of FNAC in cervical lymphadenopathy"- A one year Hospital based cross sectional study done by Dr. P Kumar Chowdary Ganga under the guidance of Dr. R. S. Mudhol, Professor of ENT J.N. Medical College, K.L.E University, Belgaum.

Respected Sir/Madam, we request you to participate in our study as you are eligible to be included. During the study you will be asked questions regarding your present and past medical history and you are supposed to answer to best of your knowledge.

Your participation in this study is voluntary. Your decision whether (or) not to participate in the study will not affect your relationship with J.N.M.C.

If you decide to participate, you are free to withdraw at any point of time.

Procedures involved:

FNAC (Fine Needle Aspiration Cytology)

Biopsy

Benefits and Risks:

After complete clinical examination patients underwent Fine Needle Aspiration Cytology, is an OPD procedure and subsequently all these patients taken up for biopsy.

Privacy and confidentiality:

All information collected about subject during course of the study will be kept confidential to the extent permitted by law. The code numbers will identify the patient in this study records and information from this may be published , but their identity will be confidential in any publication.

Institutional policy:

The costs for participating in this study are about Rs. 10,500/-. There is no external funding for this study. This will not be reimbursed.

If subject is injured as a result of participation, necessary medical help will be provided in accordance with hospital policy.

Authorization to Publish Results:

Dr. R. S. Mudhol and Dr. P Kumar Chowdary Ganga have the authority to publish results.

Consent to participate in a research study:

I Mr/Ms._____voluntarily agree to take part in this study by signing this consent form,_I am not giving up my legal rights. I may withdraw at anytime. I am signing after having read, or been read to me in the vernacular language including risks and benefits and having all queries cleared.

Contact Dr. R. S. Mudhol and Dr. P Kumar Chowdary Ganga at ENT OPD K.L.E Society's Prabhakar Kore Hospital and MRC, Belgaum, if he/she has questions about the study.

Signature or left thumb print of participant for legally authorized representative.

( )

Participant's name_____ Participant's signature/

Thumb print

( )

Experimenter's name Dr. P Kumar Chowdary Ganga Experimenter's signature

( )

Witness name_____Witness signature

_____Date

If the participants are minors, the parents sign the form, rather than the participants.

ANNEXURE - II

PROFORMA

Patients Name: **I.P.No/O.P.D. No:**

Age / Sex: **Diagnosis:**

Occupation: **DOA:**

Address: DOD:

Chief Complaints:

HISTORY OF PRESENT ILLNESS

A. Onset

B. Duration

C. Pain: since-days/month/year

Dull/throbbing/continuous/intermittent Burning/pricking

D. Cough: since-days/month/year

E. Fever: since-days/month/year

Intermittent/continuous

F. Dysphagia: since-days/month/year

Solid/liquids/both

G. Dyspnoea: since-days/month/year

Rest/exertion

H. Hoarseness of voice

I. Epistaxis

J. Foreign body sensation

K. Headache

History of Past Illness

1. Any treatment taken Medical/Surgical
2. History suggestive of tuberculosis
3. History suggestive of hypertension
4. History suggestive of diabetes mellitus
5. History suggestive of any illness
6. Any other illness

Family History

History of diabetes / hypertension/Tuberculosis in the family.

Personal History

Diet

Sleep

Appetite

Bowel

Bladder

Habits: Smoking-

Tobacco chewing-

Alcohol-

General Physical Examination

Build

Nutrition

Pallor

Cyanosis

Clubbing

Icterus

Pedal Edema

Vital signs

Pulse:

Blood Pressure:

Temperature:

Respiration:

Systematic Examination:

Respiratory System:

1. Inspection
2. Palpation
3. Percussion
4. Auscultation

Cardiovascular System:

1. Inspection
2. Palpation
3. Percussion
4. Auscultation

Central nervous system:

1. Higher functions
2. Cranial system
3. Sensory system
4. Motor system

ENT EXAMINATION

1. EAR

a. Pinna

b. Preauricular area Right Left

a. Postauricular area

b. External auditory canal

c. Tympanic membrane

d. Tuning fork test

Rinne's

Weber's

ABC

e. Facial nerve examination

2. NOSE

External appearance

Inspection

Palpation

Anterior rhinoscopy

a. Columella

b. Vestibule

c. Septum

d. Turbinates

e. Nasal mucosa

f. Any growth/polyp/ Mucosa

Posterior rhinoscopy

a. Choane

b. Soft palate

c. Eustachian tube orifice

d. Fossae of rosenmuller

e. Roof of nasopharynx

Paranasal sinuses

f. Inspection

g. Palpation

3. THROAT

a. Lips

b. Vestibule

c. Gums

d. Mucosa

e. Teeth

f. Tongue

g. Anterior pillar

h. Tonsil

i. Posterior pillar

j. Posterior pharyngeal wall

Indirect examination	Right	Left
a. Posterior 1/3 of tongue		
b. Vallecula		
c. Epiglottis		
d. Vocal cords		
e. Anterior comissure		
f. Posterior comissure		
g. Arytenoid eminence		
h. Subglottic area		
a. Anterior wall of trachea		
b. Pyriform fossa		
c. Any fixation of vocal cords		

EXAMINATION OF SWELLING

Inspection

a. Site

b. Size

c. Shape

d. Margin-circumscribed/diffused

e. Skin over the swelling

f. Discharge sinus

g. Type of discharge-serous/purulent/mucopurulent

h. Margin of sinus

i. Pulsation if any

j. Impulse on coughing

Palpation

d. Size

e. Number

f. Local temperature-raised/normal

g. Tenderness

h. Transillumination

i. Consistency

j. Fixity to skin

k. Fixity to sternocleidomastoid

4. MAXILLA AND FACIAL STRUCTURES

a. Inspection

b. Palpation

ASSOCIATED LYMPHADENOPATHY

a. axilla

b. Inguinal

c. Any other area

CLINICAL DIAGNOSIS

INVESTIGATIONS

1. BLOOD

a. Hb:

b. Tc

c. BT

d. CT

e. DC : N L M E B

f. ESR: ---------- mm / at the end of the first hour

g. Peripheral smear

h. Blood urea

2. **URINE** Alb

   Sugar

   Micro

2. Sputum for AFB
3. X- ray chest
4. X- ray neck lateral
5. F.N.A.C. Report
6. Biopsy report

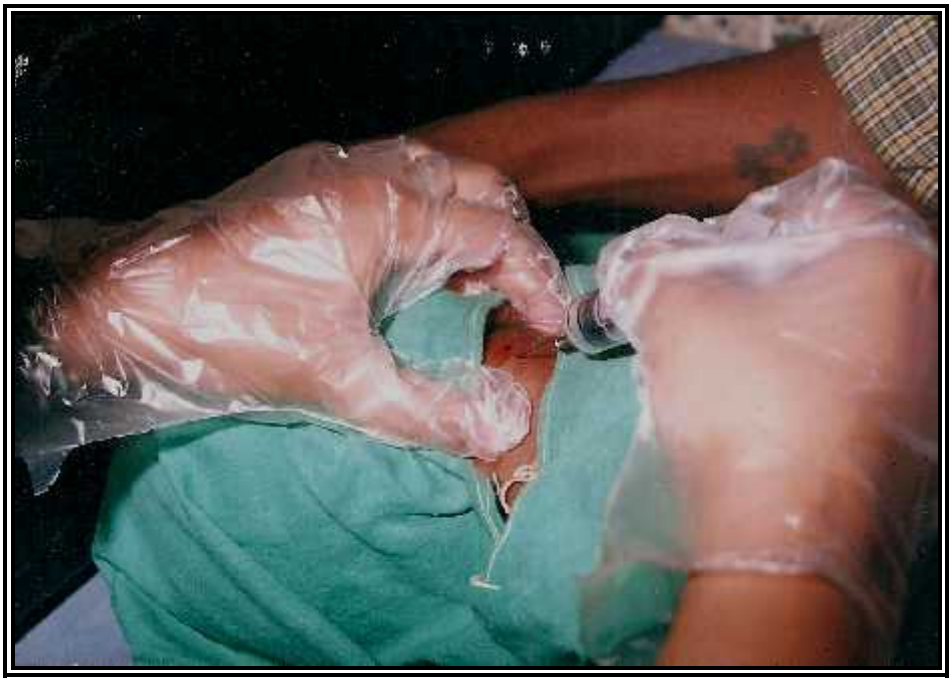
TREATMENT

1. Medical
2. Surgical
3. Raiotherapy

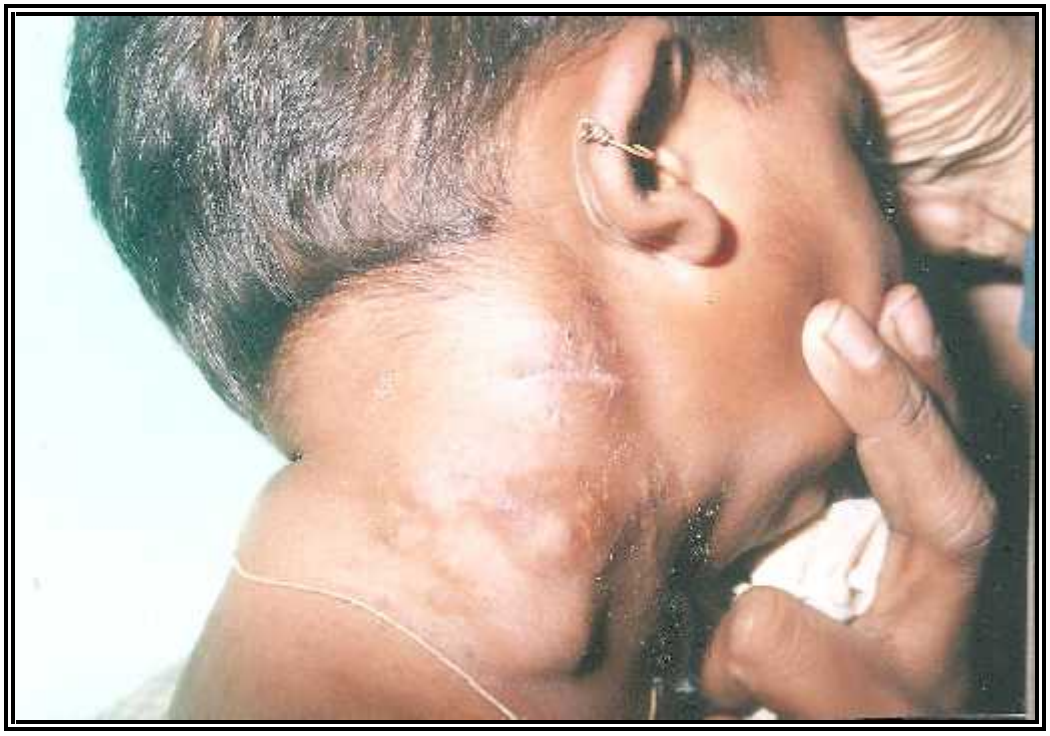
FOLLOW UP

ANNEXURE –III: PHOTOGRAPHS

Photograph 1: Materials used for needle aspiration cytology

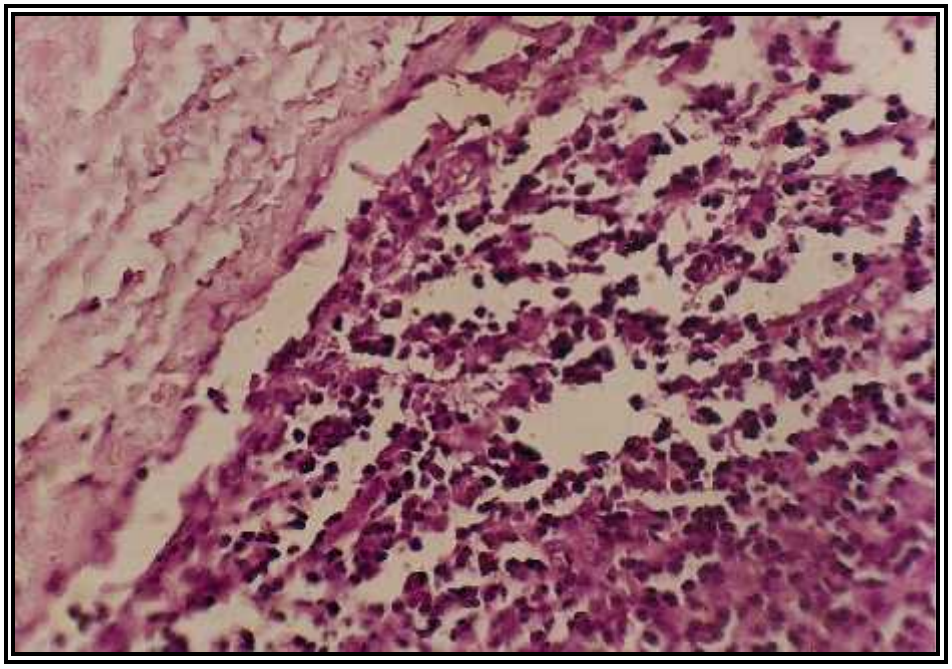


Photograph 2: Procedure of fine needle aspiration cytology being done

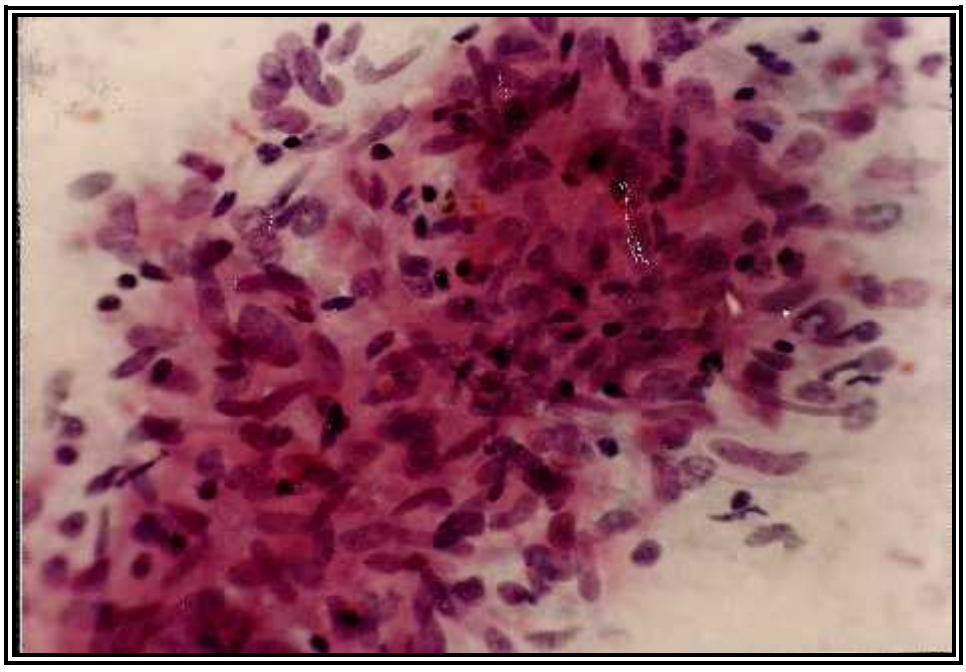


Photograph 3: A patient of multiple matted cervical lymph nodes diagnosed as tubercular lymphadenpathy

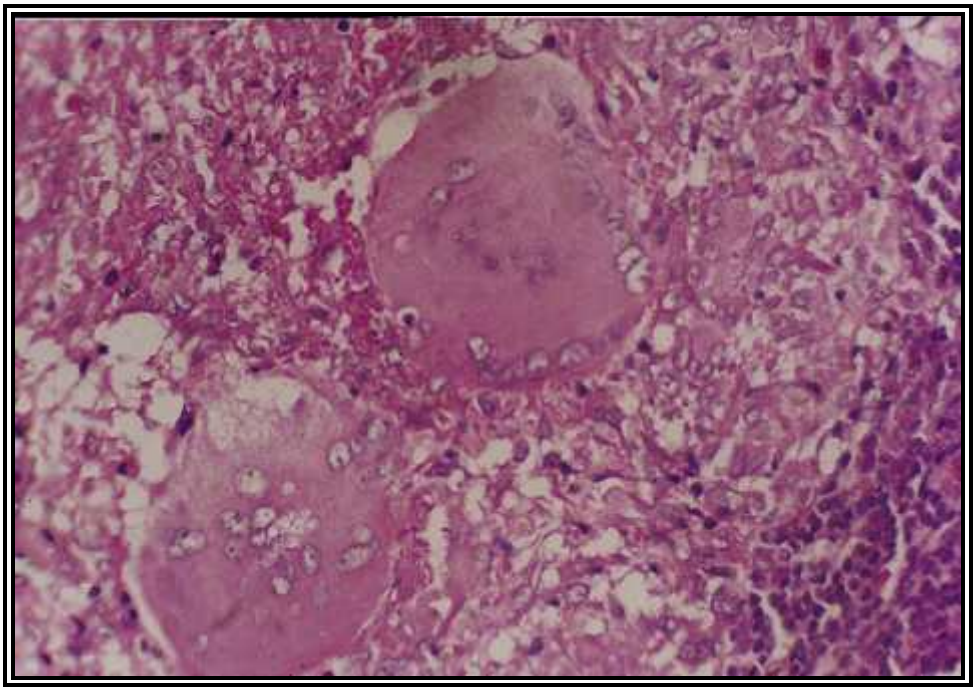
Photograph 4: A patient of carcinoma tonsil with secondaries in the neck



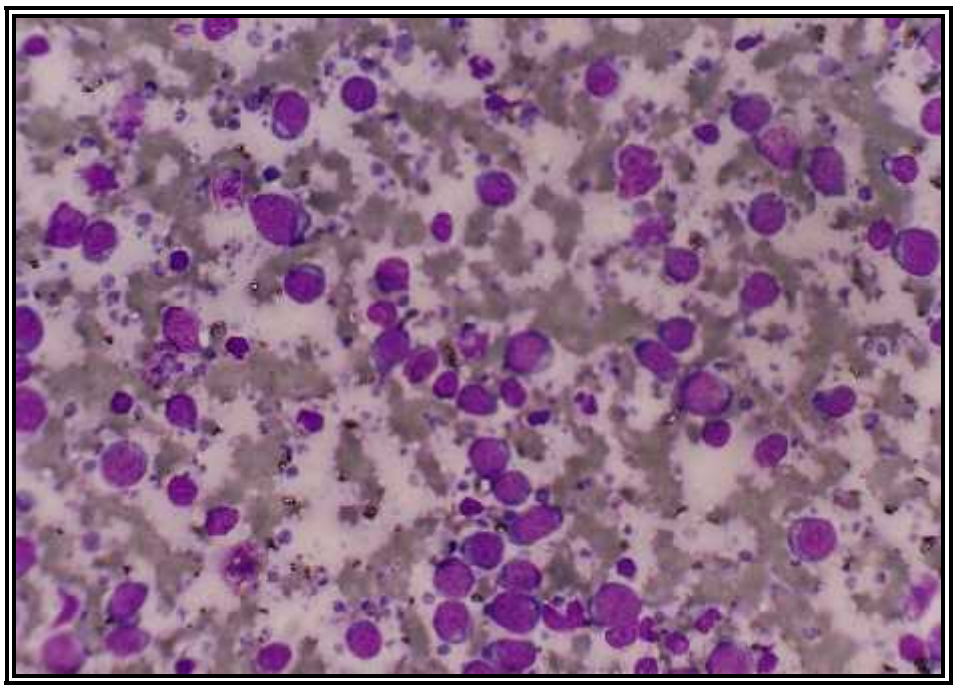
Photograph 5: Normal structure of the lymph node showing capsule, sub capsular sinus and follicles (400 x)



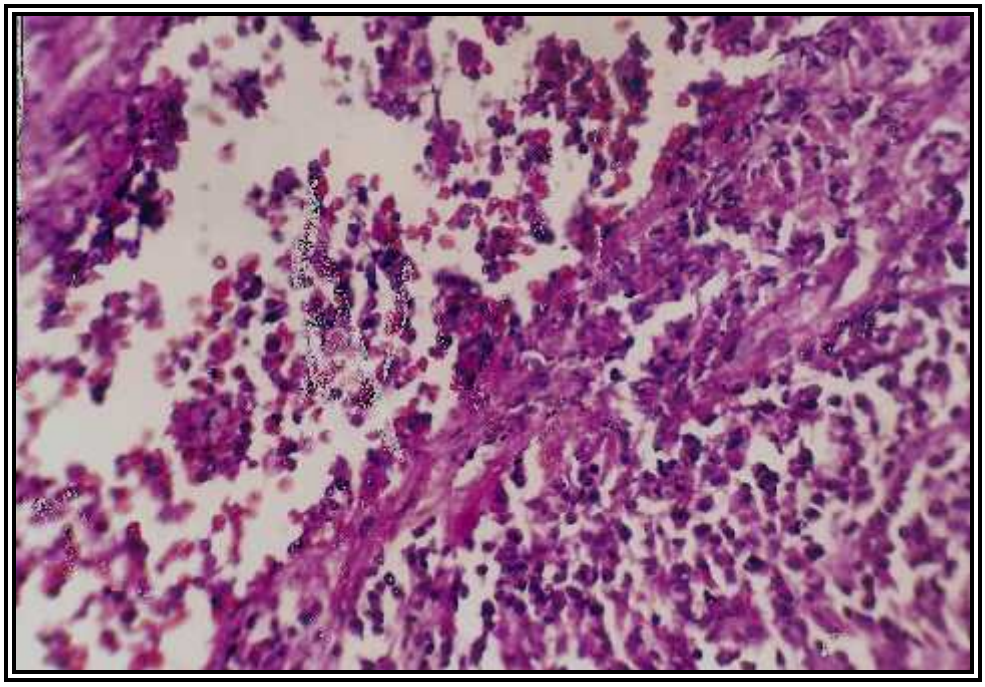
Photograph 6: Cervical lymph node aspirate of tuberculosis showing tuberculoid granuloma formed of epitheloid cells and lymphocytes (400 x)



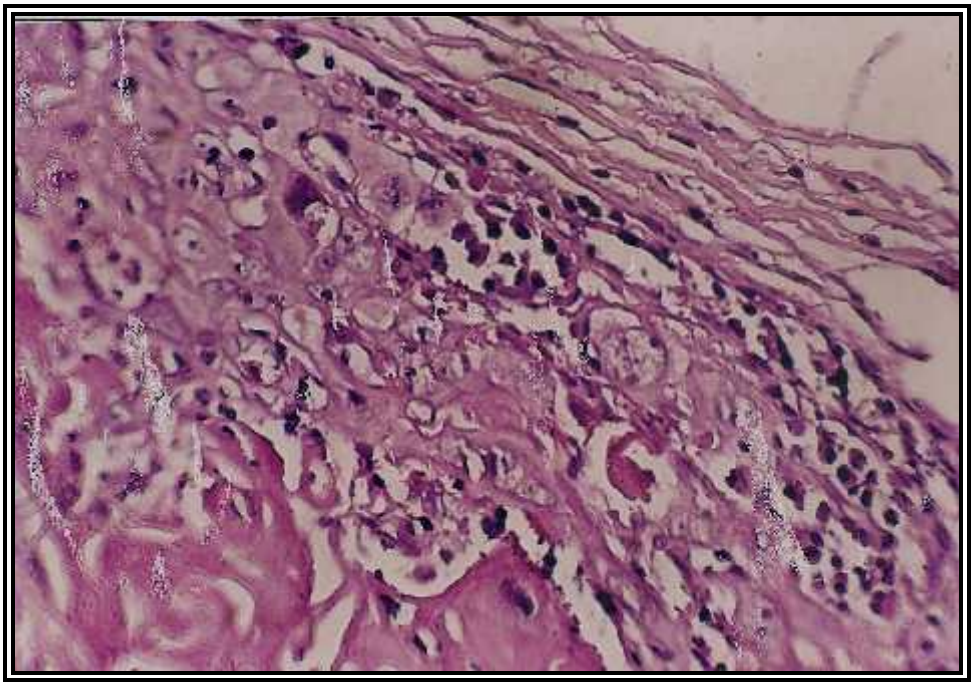
Photograph 7: Histopathological photomicrograph of tubercular lymphadenitis showing tubercular granuloma with central area of caseating necrosis surrounded by epitheloid cells langerhan's giant cells and lymphocytes (400 x)



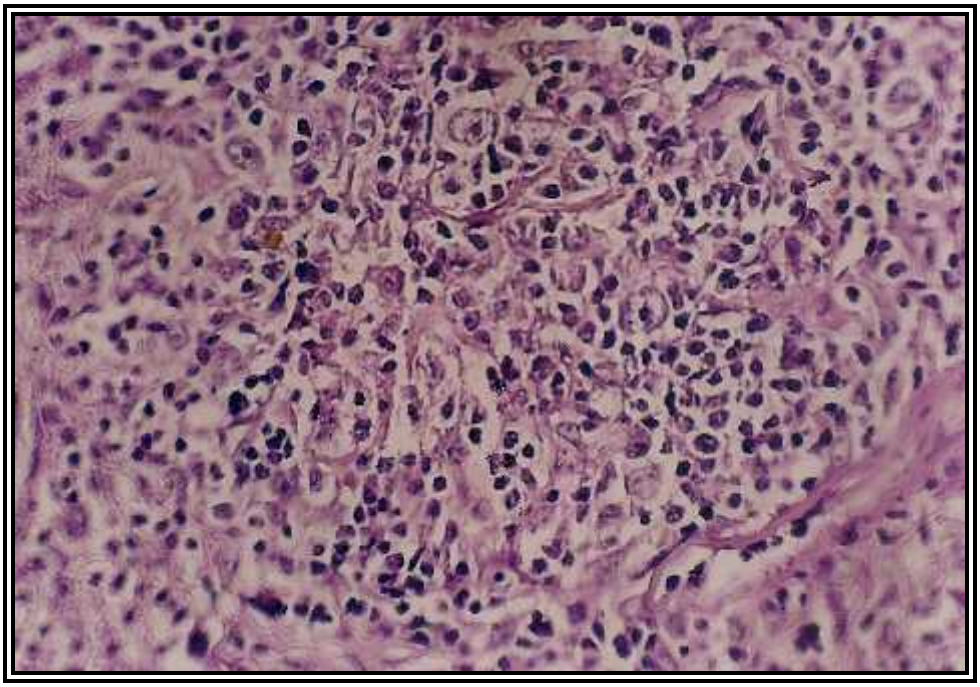
Photograph 8: Cervical lymphnode aspirate of chronic non specific lymphadinitis showing sheaths of cells comprised of neutrophils, occasional eosinophils and lymphocytes (400 x)



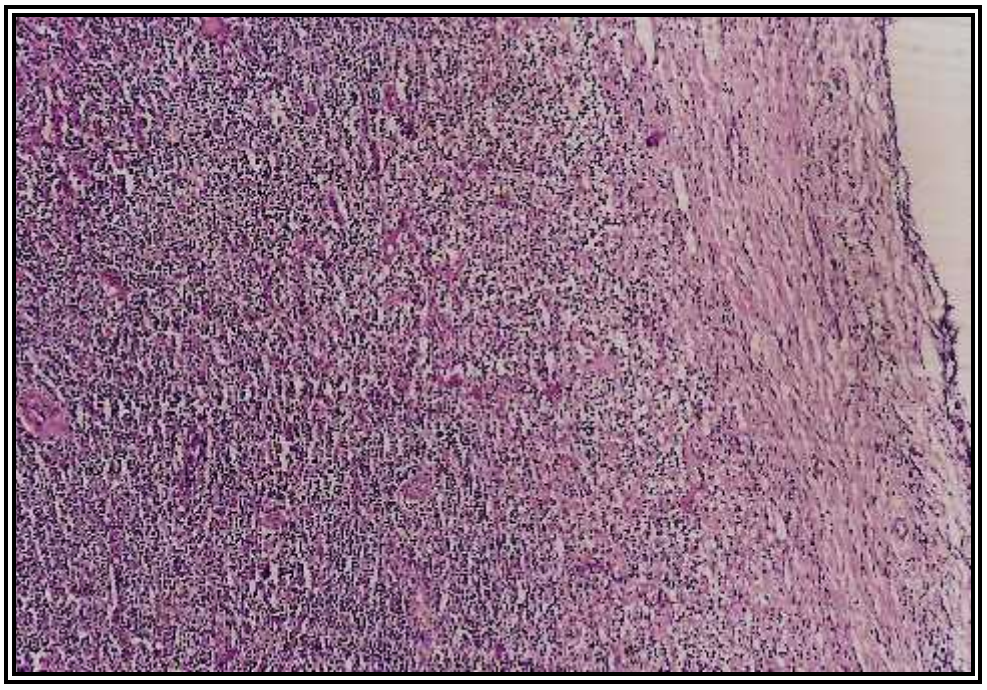
Photograph 9: Histopathological photomicrograph of reactive hyperplasia showing thickened capsule, sub capsular sinus filled with exudates and the follicles showing hyperplasia (400 x)



Photograph 10: Histopathological photomicrograph of metastatic squamous cell carcinoma showing lymphoid tissue, large keratanising squamous cells with malignant features (400 x)



Photograph 11: Histopathological photomicrograph of cervical lymph node of Hodgkin's lymphoma (400 x)



Photograph 12: Histopathological photomicrograph of cervical lymphnode of Non Hodgkin's lymphoma showing proliferative lymphoblasts, obliterating sub capsular sinus and cells sprinkling over capsule (100 x)

MASTER CHART

Sl. No.	I. P. No	Name	Age (Yrs)	Sex	Occupation	DOA	Presenting Symptoms	Duration of symptoms (Months)	EXAMINATION							Clinical Diagnosis	INVESTIGATIONS			Treatment	Prognosis
									NECK												
									ENT Relevant	Side	Site	Number	Size (Cms)	Consistency	Fixity		Routine and Relevant	FNAC	BIOPSY		
1	807625	ML	18	F	Student	10.01.08	Cough & Fever	3	-	Lt.	SM	1	2x2	Fi	Ma	TB	-	TB	TB	ATT	Improved
2	808642	MG	16	F	Student	27.01.08	Fever	1	-	Rt	PT	3	3X3	Fi	Ma	TB	-	TB	TB	ATT	Improved
3	808758	ND	50	M	Farmer	10.02.08	Throat Pain	2	PPW growth	Rt	PT	1	2x2	Fi	Mo	CA	-	CA	CA	RAD	-
4	813627	SK	64	M	Farmer	18.02.08	Cough & Fever	3	-	Lt.	UDL	1	3X3	Fi	Mo	TB	-	TB	TB	ATT	Improved
5	262755	SS	32	F	Housewife	20.02.08	Cough	1	-	Lt.	MDL	1	4X3	Fi	Ma	TB	ESR 100	TB	TB	ATT	Improved
6	819528	SM	74	M	Farmer	26.02.08	Neck Swelling	1	Rt. Pyriform growth	Rt	UDL	1	5X4	H	Fx	CA	-	CNSL	CA	RAD	Improved
7	274521	SD	45	F	Housewife	03.03.08	Cough & Fever	5	-	Rt	MDL	5	3X3	Fi	Mo	TB	-	TB	TB	ATT	Improved
8	837532	RN	39	M	Employee	14.04.08	Neck Swelling	2	-	Rt	SL	2	2x2	Cystic	Mo	CNSL	ESR 50	CNSL	CNSL	ABT	Improved
9	885722	KP	29	F	Housewife	07.05.08	Cough & Fever	1	-	Rt	SM	1	2x2	Fi	Ma	TB	-	TB	TB	ATT	Improved
10	890298	MR	38	M	Farmer	13.05.08	Neck Swelling	1	-	Rt	SM	1	2X3	Fi	Mo	CNSL	-	CNSL	CNSL	ABT	Improved
11	898568	SB	35	M	Farmer	18.05.08	Cough & Fever	3	-	Rt	UDL	1	3X3	Fi	Ma	TB	-	TB	CNSL	ABT	Improved
12	902438	MR	40	M	Farmer	04.06.08	Pain	1	-	Rt	SM	1	2x3	Fi	Mo	CNSL	ESR 70	CNSL	CNSL	ABT	Improved
13	925127	BD	60	M	Farmer	12.06.08	Throat Pain	1	-	B/L	UDL	4	3x2	Fi	Mo	CNSL	-	TB	CNSL	ABT	Improved
14	932618	KC	26	M	Teacher	18.06.08	Cough & Fever	6	-	Lt.	UDL	2	2X2	Fi	Ma	TB	ESR 100	TB	TB	ATT	Improved
15	938188	MI	35	M	Business	21.06.08	Fever	2	-	Rt	SM	1	2X2	Fi	Mo	CNSL	-	CNSL	CNSL	ABT	Improved

Sl. No.	I. P. No	Name	Age (Yrs)	Sex	Occupation	DOA	Presenting Symptoms	Duration of symptoms (Months)	EXAMINATION							Clinical Diagnosis	INVESTIGATIONS			Treatment	Prognosis
									NECK												
									ENT Relevant	Side	Site	Number	Size (Cms)	Consistency	Fixity		Routine and Relevant	FNAC	BIOPSY		
16	942109	BB	38	M	Farmer	31.06.08	Change voice	5	Left pyriform fossa growth	Lt.	UDL	1	2x2	H	Fx	CA	-	CA	CA	RAD	Improved
17	968656	PB	42	M	Farmer	04.08.08	Change voice	3	Rt. Supraglottic growth	Rt	PT	1	3X4	Fi	Fx	CA	-	CA	CA	RAD	-
18	984650	IL	60	M	Farmer	25.10.08	Cough, Fever &Vomitting	0.5	-	Lt.	MDL	1	3x3	Fi	Mo	TB	-	HDL	HDL	RAD	-
19	277319	ML	60	M	Farmer	30.10.09	Cough & Fever	2	-	Lt.	UDL	1	4X3	Fi	Mo	TB	-	TB	TB	ATT	Improved
20	295039	YV	42	M	Farmer	09.11.08	Neck Swelling	6	Rt. Pyriform growth	Rt	MDL	1	3X2	H	Fx	CA	-	CA	CA	RAD	Improved
21	986175	SP	67	F	Housewife	10.11.08	Cough & Fever	3	-	Lt.	UDL	1	3X2	Fi	Ma	TB	ESR 70	TB	TB	ATT	Improved
22	292865	SK	78	F	Housewife	02.11.08	-	1	-	Lt.	UDL	1	2X2	Fi	Mo	CNSL	-	CNSL	CNSL	ABT	Improved
23	293747	GS	73	M	Farmer	04.11.08	Voice change	1	overhanging epiglottis	Lt.	UDL	1	3X3	Fi	Mo	CA	-	CA	CA	RAD	Improved
24	303585	MK	56	M	Farmer	01.12.08	Cough & Fever	3	-	Lt.	MDL	1	3X3	Fi	Ma	TB	ESR 100	TB	TB	ATT	Improved
25	995783	SP	45	F	Housewife	04.12.08	Neck Swelling	2	-	Rt	SM	1	2X2	Cystic	Mo	CNSL	-	CNSL	CNSL	ABT	Improved
26	999625	PM	18	M	Student	06.12.08	Neck Swelling	3	-	B/L	SL	2	2x2	Cystic	Mo	CNSL	-	CNSL	CNSL	ABT	Improved
27	302818	DW	38	F	Housewife	09.12.08	Fever,Vomiting	3	-	B/L	UDL	1	3X3	Fi	Ma	TB	-	HDL	HDL	RAD	-
28	303822	SS	50	M	Farmer	10.12.08	Lesion lip	6	-	Lt.	SL	1	3X3	H	Fx	CA	-	CA	CA	RAD	Improved
29	304853	SR	65	F	Housewife	28.12.08	Change voice	6	-	Rt	MDL	1	4X4	H	Fx	CA	-	CA	CA	RAD	Improved
30	305932	TA	72	M	Teacher	30.12.08	Cough & Fever	2	-	Lt.	MDL	1	2x2	Fi	Ma	TB	ESR 90	TB	TB	ATT	Improved

KEY TO MASTER CHART

ABT	-	Antibiotic treatment
ATT	-	Anti tubercular treatment
B/L	-	Bilateral
CA	-	Carcinoma
CNSL	-	Chronic non specific lymphadinits
DOA	-	Date of Admission
ENT	-	Ear, Nose, Throat
ESR	-	Erythrocyte sedimentation rate
F	-	Female
Fi	-	Firm
FNAC	-	Fine needle aspiration cytology
Fx	-	Fixed
H	-	Hard
HL	-	Hodgkin's lymphoma
L	-	Left
M	-	Male
Ma	-	Matted
MDL	-	Middle deep cervical
Mo	-	Mobile
NHL	-	Non Hodgkin's lymphoma
PT	-	Posterior triangle
R	-	Right
RAD	-	Radiation therapy
SL	-	Submental
SM	-	Submandibular
TB	-	Tubercular lymphadenitis
UDL	-	Upper deep cervical