COMPARISON STUDY OF FNAC, CORE NEEDLE BIOPSY AND OPEN BIOPSY WITH POST OPERATIVE BIOPSY IN MESENCHYMAL TUMOURS

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CERTIFICATE

This is to certify that this dissertation entitled **"COMPARISON STUDY OF FNAC, CORE NEEDLE BIOPSY AND OPEN BIOPSY WITH POST OPERATIVE BIOPSY IN MESENCHYMAL TUMOURS"** submitted by **Dr. B. ARIVIND** to The Tamil Nadu Dr. M. G. R. Medical University, Chennai is in partial fulfillment of the requirement for the award of **M.S (General Surgery)** and is a bonafide research work carried out by him under direct supervision and guidance.

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DECLARATION

I, **Dr. B. ARIVIND** solemnly declare that I carried out this work on **"COMPARISON STUDY OF FNAC, CORE NEEDLE BIOPSY AND OPEN BIOPSY WITH POST OPERATIVE BIOPSY IN MESENCHYMAL TUMOURS"** at Department of General surgery, Government Rajaji Hospital during the period of October 2005 – October 2007.

I also declare this bonafide work or a part of this work was not submitted by me or any other for any award, degree, diploma to any university, board either in India or abroad.

This is submitted to the Tamilnadu Dr.M.G.R. Medical University, Chennai in partial fulfillment of the rules and regulation for the General Surgery Degree Examination.

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CONTENTS

INTRODUCTION

Mesenchymal Tumors are the tumors arising from the connective tissue elements that support other tissues of the body, exclusive of epithelium, glia, reticuloendothelial system and supporting tissues of various parenchymal organs. They are divided into begin and malignant types. Treatment for benign lesions are relatively simple, in contrast to malignant type of mesenchymal tumours which depends on the stage of the disease that is vitally dependant on the histological grade of the tumour.

Further more the histology of the tumours is highly variable and often contrasting.

Controversy exists over the optimal diagnostic method for mesenchymal masses.

AIM OF THE STUDY

To compare the usefulness and limitations of fine needle aspiration cytology, core needle biopsy and open biopsy with post operative full specimen biopsy, for mesenchymal tumours that are considered clinically as malignant.

REVIEW OF LITERATURE

Definition

Mesenchymal tumours are those tumours which arise from the connective tissue elements which are supporting other tissues of the body exclusive of epithelium, reticuloendothelial system, glia and supporting tissue of various parenchymal organs. It is represented by the voluntary muscles, smooth muscles, fat bony tissue, fibrous tissue and peripheral nervous system. Embryologically, the tissue form the adhesive substance between various developing primitive connective tissue elements.

Introduction

Mesenchymal tumours are highly heterogenous group of tumours that are classified on histo-genetic basis according to the adult tissue they resemble. They are divided into benign and malignant forms.

Begin mesenchymomas possess a limited capacity for autonomous growth and they closely resemble normal tissue.

Malignant mesenchymomas or sarcomas, in contrast are locally aggressive tumours that are capable of invasive or destructive growth, recurrence and metastasis. Unfortunately they term Sarcoma does not indicate the likelihood and rapidity of metastasis. For these reasons, it is important to qualify the term sarcoma with a statement, concerning the degree of

differentiation or the histological grade. Differentiation is a subjective term used to indicate the relative maturity of the tumour with respect to the normal adult tissue. Histological grade is a means of quantitating the degree of differentiation by applying a set of histological criteria. Usually well differentiated tumours are low grade lesions, whereas poorly differentiated tumours are high grade neoplasms. There are also borderline lesions in which it is difficult to determine the malignant potential and there are benign neoplastic and non neoplastic lesions that morphologically appear to be malignant, but follow a benign clinical course (Pseudo Sarcomas).

INCIDENCE : Benign mesenchymomas outnumber malignant ones by a margin of about 100:1 in a hospital population. The incidence of malignant lesions varies in different age groups, different regions and also depends on the definition or malignant tumours and the types of neoplasms included among these tumours.

There seems to be an upward trend in the incidence of malignant mesenchymal tumours, but it is not clear whether this represents a true incidence or merely reflects better diagnostic capabilities.

They are common in old age as occurs in Carcinomas. About 15% affected are younger patients and about 40% affected are 55 years of age. Incidence is more common in males when compared to females.

ETIOPATHOGENESIS:

The etiopathogenesis of most mesenchymal tumours is still unknown. Recognized causes include various physical and chemical factors, exposure to ionizing radiation, and inherited or acquired immunological defect.

a) Environmental factors:

1. Environmental Carcinogens - Polycyclic Hydrocarbons
2. Trauma or Post injury
3. Chemical Carcinogens – Dioxin (TCDD) Vinyl chloride
4. Ionising Radiation - Thorotrast

b) Oncogenic Viruses:

1. HIV – AIDS & Kaposi Sarcoma
2. HTLV – III

c) Immunological factors:

1. Immuno deficiency
2. Therapeutic Immuno Suppression
3. Stewart – Treves Syndrome – Chronic lymphedema

d) Genetic Factors:

1. Neurofibromatosis 1 & 2
2. Li – Fraumeni Syndrome (mutation of p53 gene)
3. Retinoblastoma – Rb1 gene mutation
4. Familial polyposis coli

5. Osler – Weber – Rendu syndrome

CLASSIFICATION OF MESENCHYMAL TUMOURS

The classifications are based principally on the line of differentiation of the tumour. Each of the histological categories is divided into a benign and malignant group. Only malignant and intermediate groups will be considered here.

I. Lipmatous tumours:

a) Well differentiated type

b) Myxoid type

c) Round Cell (poorly differentiated) type

d) Pleomorphic type

e) Dedifferentiated type

II. Fibrous tumours :

a) Fibromatosis

Superficial fibromatosis

Deep fibromatosis

i) Abdominal fibromatosis (Desmoid)

ii) Extra abdominal

iii) Intra abdominal

iv) Mesenteric

v) Infantile (desmoid type) fibromatosis

b) Malignant tumours

Fibrosarcoma

i) Adult

ii) Congenital or Infantile

iii) Inflammatory

III. Fibrohistiocytic tumours:

a) Intermediate tumors

i) Atypical fibroxanthoma

ii) Dermatofibrosarcoma protruberans

iii) Giant cell fibroblastoma

iv) Plexiform fibrohistiocytic tumours

v) Angiomatoid fibrous histiocytoma

b) Malignant tumours

- Storiform – pleomorphic
- Myxoid
- Giant Cell
- Xanthomatous

IV.Smooth Muscle Tumours :

- Leiomyosarcoma
- Epitheloid leiomyosarcoma

- Myxoid type

V. Skeletal Muscle Tumours :

1. Rhabdomyosarcoma

Embryonal

Botyroid

Spindle Cell

Alveolar

Pleomorphic

VI.Tumour of Blood and Lymph Vessels

1. Intermediate Tumours

Haemangioendothelioma

a) Epitheloid

b) Endovascular papillary

c) Spindle cell

2. Malignant Tumours

a) Angiosarcoma and Lymphangio Sarcoma

b) Kaposi's Sarcoma

VII. Perivascular tumours:

Malignant glomus tumour

Malignant hemangiopericytoma

VIII. Synovial tumours :

1) Synoviosarcoma - a) Biphasic

b) Monophasic

IX.Mesothelial tumours :

1. Malignant Solitary Fibrous tumour of pleura and peritoneum
2. Diffuse mesothelioma

X. Neural tumours :

1. Malignant peripheral nerve sheath tumour (mg. Schwannoma, NeurofibroSarcoma).

   a) Malignant Triton Tumour

   b) Glandular

   c) Epitheloid
2. Malignant granular cell tumour
3. Clear cell sarcoma
4. Malignant Melanocytic Schwannoma
5. Primitive neuro ectodermal tumours

XI. Paraganglionic tumours:

Malignant para ganglioma

XII. Cartilaginous and Osseous tumours :

- Chondro Sarcoma
- Osteo Sarcoma

- Malignant Osteoclastoma
- Fibrosarcoma - From fibroblast
  - From periosteum
- Malignant fibrous histiocytoma
- Ewing's Sarcoma
- Reticulum cell sarcoma
- Synovial sarcoma
- Paget's Sarcoma

XIII. Miscellaneous Tumours

- Alveolar soft part Sarcoma
- Epitheloid Sarcoma
- Malignant Extrarenal Rhabdoid Tumour
- Desmoplastic Small cell tumour

XIV. Unclassified tumours

LIPOSARCOMAS:-

Liposarcomas are one of the most common sarcomas of adulthood and appear in the 40-60 years of age. Common sites – proximal extremities and retro peritoneum. Histologically they are divided into well differentiated, myxoid, round cell and pleomorphic variants. Well differentiated form show lipocytes and the other variants show lipoblasts. The behaviour of the tumour is

dependant on the histological nature of the tumour. Round cell and pleomorphic forms are aggressive and frequently metastasize.

FIBROMATOSES :

Superficial – Palmar, Plantar penile fibromatoses

Deep fibromatoses (Desmoid Tumours)

Biologically lies in interface between exuberant fibrous proliferations and low grade fibrosarcomas. Deep seated fibromatoses are called Desmoid Tumours. They can occur at any age, but most frequent in 2^{nd} to 3^{rd} decades.

Desmoids are divided into extra abdominal, abdominal and intra abdominal. Extra abdominal desmoids occurs frequently in males principally in the musculature of shoulder, chest wall, back and thigh. Intra abdominal desmoids occur in mesentery (or) pelvic walls. Abdominal desmoids generally arise in the musculo aponeurotic structures of anterior abdominal wall, especially in women. Grossly appears as grayish white firm masses of 1 to 5 cm in greatest diameter. Histologically the centrally dense collagenous and peripherally plump fibroblasts are present. Multinucleate giant cells may be present. Frequently recurs locally after excision. Chemotherapy, radiotherapy and hormonal therapy are also useful.

FIBROSARCOMA:

It occurs commonly in retroperitoneum, then in thighs, knees and distal extremities. They are unencapsulated, infiltrative, soft, fish flesh masses with areas of haemorrhahge and necrosis histologically varying degrees of differentiation, from resemblance of cellular fibromas to highly cellular neoplasms with areas of necrosis, pleorphism, frequent mitoses and architectural disarray are seen. Herringbone fashion of arrangement may be seen. Recurring in more than 50% and metastasizing in 25% cases.

MALIGNANT FIBROUS HISTIOCYTOMA:

Heterogeneous group of aggressive soft tissue tumour characterized by considerable cytologic polymorphism. The presence of bizarre multinucleated cells, Storiform architecture and a background of inflamed collagenous stroma with foamy macrophages. Grossly they are grey white unencapsulated masses, 5 to 20 cms size. Types are myxoid, pleomorphic, inflammatory, giant cell and angiomatoid variants. Storiform – pleomorphic type is the most common type. Most variants of MFH are aggressive, recur unless widely excises.

RHABDOMYO SARCOMA

Most common soft tissue sarcomas of childhood and adolescence. It occurs commonly in head & neck, then in urinary tract, extremities and trunk.

Grossly appears as grayish white to brownish fleshy masses. Rhabdomyosarcoma is histologically sub classified into embryonal, alveolar and pleomorphic variants. Embryonal type includes sarcoma botryoides and spindle cell variants. Rhabdomyoblasts with cross striation may be present. Rhabdomyo Sarcoma are aggressive neoplasms and usually treated with a combination of surgery and chemotherapy with or without radiation. The histologic variant and location of the tumour influence survival. Botryoid subtype has better prognosis.

LEIOMYO SARCOMA

They account for 10% to 20% of soft tissue sarcomas. Male female ratio is equal. Mostly arise from skin and soft tissues of extremities and retroperitoneum and achieve large size. They consist of numerous capillary channels enclosed within nests of spindle shaped cells – pericytes. The tumor may recur and as many as 50% metastasize to lungs, bone and liver; Regional lymphnodes are also affected.

KAPOSI'S SARCOMA

Sarcoma commonly associated with AIDS. Clinically four forms occur : - European, African, Transplant associated and AIDS associated. Clinically, picture varies from multiple red to purple skin nodules or plaques to large spongy confluent lesions. In disseminated disease, mucosal surface, lymph

nodes, salivary glands and viscera are involved. Microscopically pulmp, spindle shaped, stromal cells containing spaces filled with RBCs and lined by recognizable endothelium. Growth factors released by HIV infected lymphocytes induce the proliferation of Kaposi's sarcoma spindle cells.

HAEMANGIO ENDOTHELIOMA:

Hemangio endothelioma represent an intermediate grade between the well defined haemangiomas and frankly anaplastic angiosarcomas. Most frequenly encountered in skin, but may affect spleen and liver. Histologically, vascular channels are evident, with masses and sheets of spindle shaped cells with mitotic figures and some pleomorphism.

Epitheloid hemangio endothelioma, unique vascular tumour occurring around medium sized and large veins in the soft tissues of adults.

SYNOVIAL SARCOMA

It accounts for 10% of all soft tissue sarcomas and 4th most common sarcoma. Mostly occurs in 20-40 years of age: majority develop in the vicinity of large joints of extremities, especially lower extremities around knee joints an thigh. Uncommonly parapharyngeal region and abdominal wall are involved.

Histologic hallmark is biphasic morphology of tumour cells (epithelial like cells and spindle cells). The tumour cells do not have the features of synoviocytes despite its mimicry as synovium. Most synovial sarcomas are

monophasic. Calcified concretions may be seen. Immuno histochemically reacts for Keratin, epithelial membrane antigen, differentiating from other sarcomas.

They are treated aggressively with limb sparing therapy. Commonly metastasize to lymphnodes, lung and skeleton.

MALIGANT PERIPHERAL NERVE SHEATH TUMOUR:

They arise denovo or following radiotherapy from transformation of a plexiform neurofibroma, the fact provides the basis for their association with neurofibromatosis type I. The lesions are poorly defined tumour masses with frequent infiltration. Necrosis is commonly present. Microscopically, tumour cells may resemble schwann cells with elongated nuclei and prominent bipolar processes. Mitosis, necrosis and extreme nuclear anaplasia are common. Tumour cells may be immuno reactive to S.100 protein. Highly malignant sarcomas, locally invasive, frequently lead to recurrence and metastatic spread.

CHONDROSARCOMA:

Chondrosarcomas are the second most common malignant matrix producing tumours of bone. They arise commonly in axial skeleton, and rarely in long bones. Age group affected commonly is above forty years M:F = 2:1 in younger age group, clear cell and mesenchymal variants are common.

It can occur from preexisting enchondroma, osteochondroma, chondroblastoma, fibrous dysplasia or paget’s disease. Histologically classified

as conventional (hyaline, Myxoid), clear cell, differentiated, mesenchymal and dedifferentiated variants. Grossly, large bulky tumours made up of greywhite nodules with glistening tissue having viscous and gelatinous ooze from cut surface. Grading done by cell morphology, cellularity and mitosis. Most of the lesions are of grade I & II. Classifications may be present among the foci of cartilaginous matrix. Tumours more than 10cm mostly behave aggressively. Chondrosarcomas metastasize preferentially to the lungs and skeleton. Most of the tumours are treated by wide surgical excision, the mesenchymal and dedifferentiated tumours are treated in addition with chemotherapy, due to their aggressive clinical course.

STAGING AND GRADING OF MESENCHYMAL TUMOURS

Staging provides short hand information regarding the state or extent of the disease at a particular designated time, preferably at the time of initial histological diagnosis.

Grading determines the degree of malignancy and is based on an evaluation of several histological parameters like

a) Degree of cellularity
b) Cellular polymorphism or anaplasia
c) Degree of necrosis
d) Expansive or infiltrative and invasive growth.

Additionally, also by amount of matrix formation, presence or absence of haemorrhage, calcification and inflammatory infiltrate.

The limitations and pitfalls of grading systems vary as

1) The significance and predictive values of various histological parameters differ in various types of sarcomas.
2) Recurrent lesions after therapy shows a higher degree of differentiation than primary tumours.

MESENCHYMAL TUMOURS

DEFINITION OF GRADING PARAMETERS

PARAMETER	**SCORE**
I. Degree of tumour differentiation :	
a) Close resemblance to normal adult tissue	1
b) Tumour type clearly	2
c) Tumour type uncertain	3
II. Tumour necrosis	
a) No tumour necrosis on any slide	0
b) Less than 50% Tumour necrosis	1
c) More than 50% tumour necrosis	2

III. Mitotic count

a) 0-9/per 10 Hpf	1
b) 10-19/per 10 Hpf	2
c) 20 + / per 10 Hpf	3
HISTOLOGICAL GRADE	Total
Score	
Grade I	2,3
Grade II	4,5
Grade III	6,7,8

STAGING SYSTEMS

I. ENNEKING SYSTEM : Anatomical presentations:

T1 - Intra compartmental tumours confined within the boundaries of well defined anatomical structures.

T2 – Extra compartmental neoplasms that arise within or involve secondarily extrafascial planes or spaces that have no natural anatomical barriers for extension.

Grades :	Grade I	-	Low grade
	Grade II	-	High grade
Stages :	Stage I	-	Low grade tumours without metastasis

Stage II - High grade tumours without metastasis

Stage III - Lesions of either grade with metastasis.

Each of these stages is sub classified to the anatomical presentation of the lesion (T1 to T2)

A – Signifies intra compartmental lesions

B – Signifies extra compartmental lesions.

II AMERICAN JOINT COMMITTEE (AJC) Staging System

It is the commonly followed system universally. It uses

1) The size and extension of the primary tumour (T)
2) The involvement of lymph nodes (N)
3) The presence of metastasis (M)
4) The type and grade of the tumour (G)

AJCC STAGING OF MESENCHYMAL TUMOURS

Definitions of TNMG

T : Primary Tumour

T1 – Tumours less than 5cm

T2 – Tumour 5 cm or greater

N : Nodal status

N0 – No histologically verified metastasis to regional lymph nodes.

N1 – Hisotlogically verified regional lymph node metastasis

M : Distant metastasis

M0- No Distant Metastasis

M1-Distant metastasis

G – Historigical grade of malignancy

G1 – Low (Well differentiated)

G2 – Moderate (moderate differentiated)

G3 – High (poorly differentiated)

G4 – Undifferentiated

AJC STAGING OF MESENCHYMAL TUMOURS :

Definition of stages

Stage I	-	State I_a	-	$(G_1T_1N_0M_0)$
1		Stage I_b	-	$(G_1T_2N_0M_0)$
Stage II	-	Stage II_a	-	(G_2,T_1,N_0M_0)
		Stage II_b	-	(G_2,T_1,N_0M_0)
Stage III	-	Stage III_a	-	$(G_{3,4}T_1N_0M_0)$
		Stage III_b	-	$(G_{3,4}T_2N_0M_0)$
Stage IV	-	Stage IV_a	-	$(G_{1\text{-}4}T_{1\text{-}2}N_1M_0)$
	-	Stage IV_b	-	$(G_{1\text{-}4}\ T_{1\text{-}2}\ N_{0\text{-}1}\ M_1)$

ADVANTAGES AND DISADVANTAGES OF STAGING SYSTEM

Enneking System:

Advantages:

1) Best suited for well documented mesenchymal tumour arising in extremities as emphasis on compartmentalization is given.
2) Retrospective staging not possible
3) Two tier grading system, too narrow for wide biological range of mesenchymal tumours.

AJCC Staging:

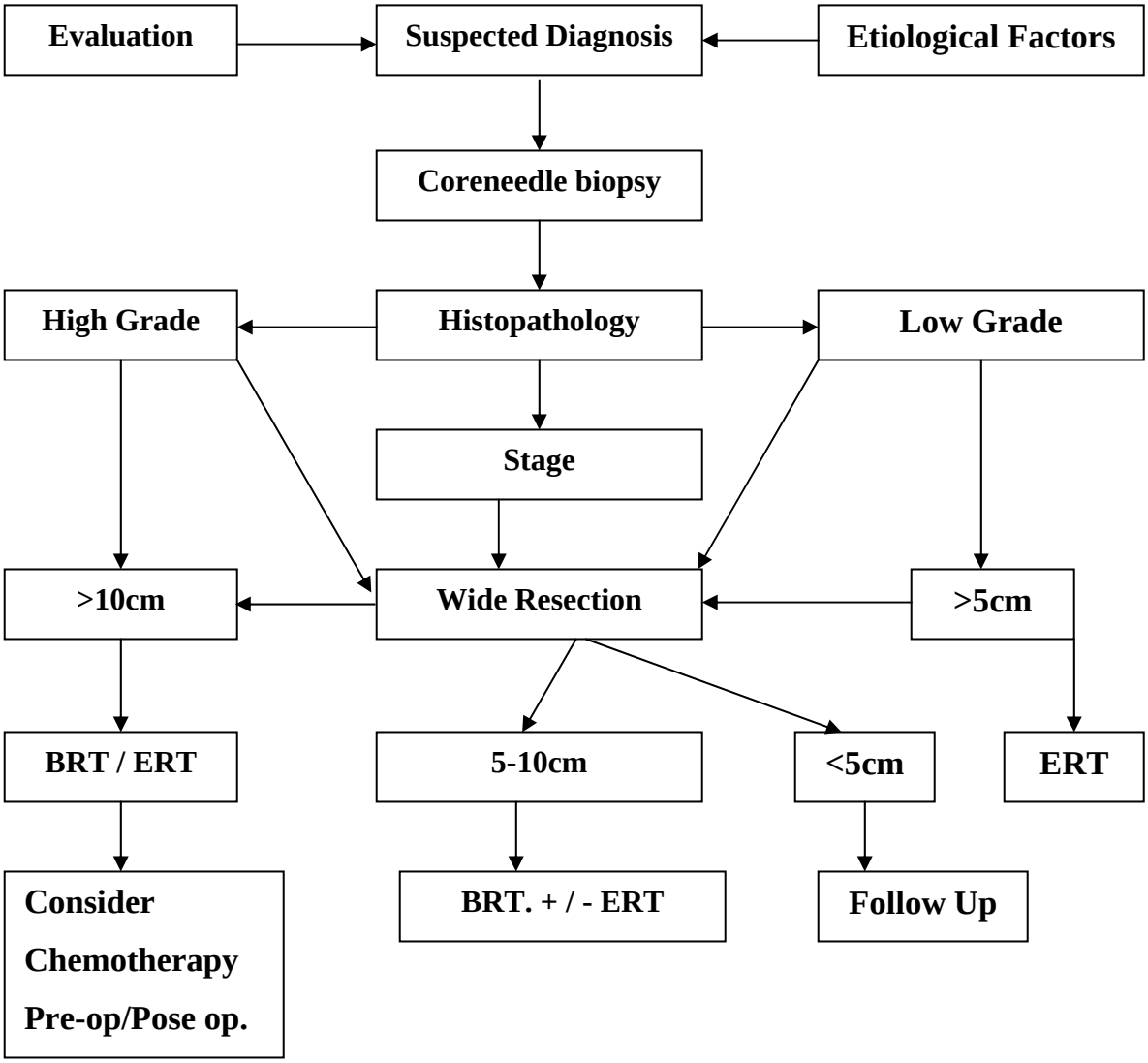
Advantages :

1) Universally acceptable
2) Individual details like type, size and depth of tumour addressed
3) Grading sufficiently given importance
4) Retrospective staging possible

Disadvantages :

1) Greater complexity of the system.

Management of Algorithm for Malignant Mesenchymal tumours



BRT – Brachy Radio Therapy

ERT – External Radio Therapy

For unresectable tumours, either preoperative radiotherapy or chemotherapy is used.

SURGICAL TREATMENT:

Resection of the lesion carried out with a clearance of 2cms in all dimensions along the uninvolved tissue and the procedure called according to the amount of resection namely local excision, wide excision, compartmental excision and amputation.

Amputation should be reserved only for those tumours not able to be resected by any other means. Amputation should be performed one joint above the lesions because intra – medullary spread of the tumours is common. Local recurrence is common in those undergoing limb sparing surgery with irradiation compared to that of amputation.

ADJUVANT CHEMOTHERAPY : Preoperative

Postoperative

Drugs used are :
1) Cyclophosphamide 700 – 1000mg/m2
2) Doxo rubicin 50 to 70 mg/m2
3) Vincristine – 1.6 to 2mg/m2
4) Methotrexate 50 to 250mg/m2

Other drugs used include – Ifosfamide, Dacarbazine and Carboplatin.

INTRA ARTERIAL CHEMOTHERAPHY:

1) Intra arterial infusion of chemotherapeutic agents with or without tourniquet is used.

2) Most commonly used agents – Doxo rubicin
3) Continuous infusion over 1 to 10 days via a percutaneouly placed cather is used
4) Complications include
    i. Arterial thromboembolism
    ii. Necrosis and pain
    iii. Infection
    iv. Delayed wound healing

PRE OPERATIVE CHEMOTHERAPY:

It is used for the following purposes

a) To avoid radical resection
b) To limit the spread of tumour at the time of operation
c) Occult micro metastasis would be dealt with pre-operatively
d) Agents used include – Cyclophosphamide, vincristine, Doxorubicin, Dacarbazine and Ifosfamide.

Adjuvant and Pre-Operative Radiotherapy

For advanced and unresectable tumours preoperative radiotherapy in the form of Brachy therapy or external beam radiation therapy is used. It is useful for the shrinkage in the size of the tumour and also for the reduction in the vascularity so that surgery becomes easier.

Intra operative radiotherapy (IORT), for Retroperitoneal sarcomas is available. Dose usually used is 20 Gy. For head and neck sarcomas, post operative adjust external beam radiation is used.

Role of Hyperthemia:

Whole body hyperthermia achieved with extracorporeal heating of blood has been combined with chemotherapeutic agents like Ifosfamide and carboplatin, is used in the management of Soft tissue Sarcomas.

PROGNOSTIC FACTORS:

Factors increasing the risk of local recurrence

1) Age more than 50 years
2) Recurrent disease at the time of presentation
3) Positive histologic primary margins
4) Histologic subtupes of fibrosarcoma including desmoids.

Factors increasing the risk of distant metastasis

1. Tumour size greater than 5cm
2. Histologic high grade
3. Deep location of the tumour
4. Recurrent disease at the time presentation.

FINE NEEDLE ASPIRATION CYTOLOGY

For a diagnosis of mesenchymal tumours successful FNAC smear is to be obtained and it must be correctly done with utmost caution. Otherwise the false negative results will be high even in the hands of experienced clinicians.

Materials

1. Spirit (or) any lodine based antiseptic solution.
2. Cytofix, which contains absolute alcohol as the main constituent.
3. Microscopic slides of 76mm x 26mm size, with frosted ends for labeling patients name and number, in pencil.
4. Sterile disposable 10ml Syringe with 23 or 24 G needle (with outer diameter of 0.6mm, 2.5 cm in length).
5. Patinet’s clinical details to be filled up in laboratory requisition form.
6. Transport box.

METHODS:

For FNAC, no anaesthesia is necessary. The paitents should be thoroughly explained of the procedure to be done and consent to be obtained for the same. An antiseptic solution should be used to clean the skin over the

swelling. The lump is located and firmly held between the thumb and index finger of free hand. The needle is pushed into the mass delicately by an oblique track, perceiving the tissue texture on entry and penetration. Plunger of the syringe is retracted creating a negative pressure. Without loosing the pressure or pulling the needle tip out of the skin the whole syringe is rotated and gently moved in & out. Maintain the negative pressure continuously. The cells are sucked into the lumen of the needle. Now slowly release the pressure on the plunger. With draw the syringe and needle gently from the skin. Pressure is exerted over the puncture site with a cotton wool.

Expelling the biopsy material:

After disconnecting the needle from the syringe, fill the syringe with air. Replace the needle firmly. The syringe should be held vertically with the needle tip above the surface of the microscope slides.

Push the plunger down carefully with force. Now the contents extracted from the swelling are sprayed over the slides. The process may be repeated for another few times also.

Preparation of slides:

The tissue fluid that is sprayed over the microscope slides after being blown by the syringe, is allowed to dry in air for 3-5 minutes. Cytofix solution (absolute alcohol based solution) is used to fix the smear. The smear must be

fixed before air drying, when papanicolaou stain is used. Then the slides are carefully labeled and sent to the laboratory.

Fixatives and Fixation:

A number of fixatives are used in cytology. The common ones are modifications of 95% ethyl alcohol. It alone can be used with satisfactory results but addition of 3% glacial acetic acid increases the nucleoprotein fixing properties. This is a standard fixative and gives excellent nuclear and cytoplasmic morphology.

Fixation doesn't require more than five minutes but a minimum of 10 to 15 minutes is advisable for proper adhesion of the smear to the slide. If necessary, smear must be kept in the alcohol or other solution over a long period of time. Smears which are to be mailed to the laboratory for staining should be fixed in alcohol – ether for atleast one hour. If ether is not available, 95% ethyl alcohol alone can be used. Methyl or even isopropyl alcohol can be used as substitutes even though they are less desirable.

CORE NEEDLE BIOPSY

The procedure of core needle biopsy is a minor surgical procedure and it must be performed with utmost caution and precautions of a surgical procedure, to obtain the maximum possible amount of tissue for Histopathological examination of the lesions.

Materials

1) Spirit swabs and lodine based antiseptic solutions
2) Disposable needle of 23 or 24G size
3) Coreneedle biopsy (Tru – Cut) needle (25cm x 2.5mm size)
4) Diposable 2ml syringe
5) Bottles containing 10% formalin
6) No:11 – Surgical blade.
7) 2% Lignocaine solution
8) Patients clinical details to be filled up in laboratory requisition form.

Methods:

For coreneedle biopsy, local anaesthesia is used. The procedure to be done is explained to the patient and consent obtained. The site of the swelling is thoroughly cleansed with iodine preparations and then the spirit. The elected site has to be exposed under good light after taking all aseptic precautions. The site is infiltrated with 0.5ml of 2% xylocaine and 7-10 minutes to be allowed

for achieving local anaesthesia. Then with No.11 blade a small incision of less than 5mm is made. The coreneedle biopsy needle is pushed into the mass gently by an oblique track. Through the incised site the plunger is advanced and held firmly. Then the cutting edge of the needle advanced, thereby harvesting the tissue that has taken up in the slot provided.

OPEN BIOPSY

It is of two types : Excisional biopsy and Incisional biopsy.

1. Excisioal Biopsy: It refers to removal of entire grossly evident lesions, usually with significant margin of normal tissue, excisional biopsy should be reserved for lesions less than 3 to 5cm in diameter or for very superficial tumours. Excisional biopsy of large or deep tumours are undesirable since they can contaminate surrounding tissue planes. And this may compromise the subsequent definitive surgical procedure.

2. Incisional Biopsy: It is the appropriate technique for diagnosing most soft tissue masses. This technique involves the removal of a generous wedge of tissue, which is minimally manipulated at the time of surgery.

1. For extremity lesions, the incision should be oriented along the long axis of the extremity.

2. For Truncal or retroperitoneal lesion, the biopsy incision should be situated in such a way that it can be readily excised along the tumour, if a Diagnosis of malignancy is made.

3. The biopsy site should be directly over the tumour, at the point where the lesion is closest to the surface.

There should be no raising of flaps or disturbances of tissue planes superficial oto the tumour.

5. Perfect haemostasis has to be obtained; to prevent hematoma, which could disseminate tumour cells through normal tissue planes.

6. No drain should be kept

7. In case when a drain is mandatory, it should exit either through or very near the biopsy incision.

8. If malignancy is proved, the drain tract must be excised in continuity with tumour tissue.

Open biopsy yields the exact, histologic type of tumour, grade of the tumour and the specimens obtained through open biopsy often are sufficient enough to subject the tumour to ancillary studies like Immunohisto chemistry cytogenentics and flow cytometry.

STAINING PROCESS IN FNAC

For routine wet fixation with ethanol and staining by papanicolaou technique, standard Eosin – Haematoxylin methods are used. Both these methods make use of Harris heamatoxylin.

Romanowsky stain (ie) Giemsa or May grun wald – Giemsa may be used.

'DIFF QUIK' – rapid staining method can also be used when preoperative FNAC is performed and immediate diagnosis is required.

EOSIN:

To demonstrate the general histological architecture of a tissue, eosin is the most suitable stain in combination with an alum haematoxylin. It is of particular value in its ability to distinguish proper differentiation between the cytoplasm of different types of cells. The eosins are xanthine dyes and the following are easily available eosins commercially.

a) Eosin – B (ie Eosin blue)

b) Eosin –Y (ie Eosin yellow)

c) Ethyl Eosin (ie Eosin alcohol solution)

Of these, Eosin –Y is the most widely used and even though it is water soluble, it is satisfactorily soluble in alcohol also. It is usually used as 0.5% to 1% solution in distilled water with a crystal of thymol added to inhabit the

growth of fungi. It is used as a cytoplasmic stain. In order to sharpen the staining, a little acetic acid is added. Differentiation of eosin staining occurs in sufficient tap water wash and further differentiation occurs during dehydration through alcohol. The intensity of eosin staining and the degree of differentiation required is largely a matter of individual pathologist's choice.

Harris Haematoxylin:

This is an alum haematoxylin which is chemically ripened with mercuric oxide. It gives clear nuclear staining and for this reason, it has been used in the diagnostic cytology with eosin as a counter stain. In cytology. Harris haematoxylin is used as a progressive stain but in routine histological use, it is used regressively.

The constituents are:

Haemotoxylin	-	2.5gm
Absolute alcohol	-	25ml
Potassium alum	-	50gm
Distilled water	-	500ml
Mercuric oxide	-	1.25gm
Glacial acetic acid	-	20ml

The haematoxylin is dissolved in absolute alcohol, then added to alum which has been previously dissolved in warm distilled water in a two litre flask.

The mouth is rapidly brought to the box and the mercuric oxide is then added. By plunging the flask into cold water or into a sink containing ice, the stain is rapidly cooled. Then, the acetic acid is added and the stain is ready for immediate use. Addition of glacial acetic acid gives more precise and selective staining of the nuclei.

Papanicolaou Technique of Staining:

This is the method of choice in cytology. Because it gives a dependable nuclear morphology with clear translucent demonstration to the cytoplasm. For this the following stains are to be prepared.

a) Harris haematoxylin
b) OG – 6
c) EA -50

The following are the results obtained after staining

Nucleus	-	blue to black
Cytoplasm	-	Pink to green
RBC	-	Orange to red
Fibrin	-	Deep pink

Haematoxylin and Eosin Staining:

This technique is not superior to papanicolaou technique for clarity and detail, but many cytopathologists use this method because they are already familiar with this type of staining on histological section.

STAINING PROCESS FOR HISTOPATHOLOGICAL EXAMINATION:

The specimen of tissue obtained by core needle biopsy, following fixation with 10% Formalin, is subjected to various procedures.

1) Fixation
2) Tissue processing - Dehydration
   - Clearing
   - Wax Impregnation
3) Embedding
4) Section cutting using microtome
5) Staining

Staining Procedure:

Staining procedure commonly adopted is by using Haematoxylin and Eosin Staining. Special Stains like verhoff stain, van gieson stain, and Komori's stain are also used.

Results:

Muscle, Keratin, Elastic fibres	-	Bright red
Collagen, reticulin	-	Pink
RBCs	-	Orange

CYTO DIAGNOSTIC CRITERIA FOR DIAGNOSIS OF MALIGNANCY

a) Structural changes in cells and nuclei

b) Changes in inter – relationship of cells

c) Indirect diagnostic criteria.

I) Structural changes in cells:

1. Cytoplasmic changes :

    a) Cytoplasmic inclusion bodies

    b) Marked basophilia

    c) Atypical vacuolation

2. Nuclear changes:

    a) Hyper chromasia

    b) Increased nuclear cytoplasmic ratio

    c) Abnormal and increased mitotic figures

    d) Enlarged and increased number of nucleoli

    e) Structural abnormalities like loculation, elongation or indentation of nucleus.

3. Changes in the cell:

    a) Enlargement of cells

    b) Aberrant forms

II Changes in the inter – relationship of cells

a) Loss of polarity

b) Anisocytosis

c) Lack of distinct cell boundaries

d) Engulfment of one cell by another.

III. Indirect diagnostic criteria:

a. Prominance of histiocytes

b. Excess of lymhocytes

c. Presence of red blood cells.

CYTOLOGICAL REPORTING

Cytology reporting consists of four categories of cells

I. Presence of Benign cells:

FNAC smear shows acute and chronic inflammatory cells and degenerated epithelial cells – No malignant cells was seen.

II. Presence of malignant cells:

The smear shows pleomorphic, hyperchromatic malignant epithelial cells with variations in the nuclear cytoplasmic ratio.

A define cytological diagnosis of cancer should be based on the predominance of unmistakable cancer cells and on the presence of a few scattered suspicious cells among normal cells. More information about the grade and differentiation of the tumour cannot be obtained.

III No epithelial cells seen

The smear may show eosinophilic material, and a few inflammatory cells or adipose tissue. This is due to unsatisfactory smear preparation.

IV Presence of suspicious malignant cells:

If the specimen is very scanty or the specimen is cellular and suggest a well differentiated malignancy but not clear cut enough to submit the patient for definite treatment for cancer. The aspiration should be repeated and if necessary a biopsy recommended.

HISTOPATHOLOGICAL CRITERIA FOR MALIGNANCY:

a) Structural changes in cells and nuclei
b) Changes in the interrelationship of cells
c) Alteration of tissue architecture
d) Invasion of adjacent structural elements.

Structural changes in cells and nuclei and changes in interrelationship of cells are noted in a similar manner, as followed for FNAC study. However the HPE of the specimen, for giving the needed information relies upon the alteration of tissue architecture within the site of origin and in surrounding structures near by the origin and also on the invasion of adjacent structures namely capsular invasion, vascular and lymphnodes invasion.

HPE report carries the following entities:

1. Histologic type of the tumour
2. Grade of the tumor – I, II and III
3. Size of the tumour – Cm in greatest diameter.
4. Location - subcutis, muscle, body cavity
5. Margins - Positive, negative (if less than 1cm, give measurement)
6. Necrosis - <15%, >15%
7. Invasion - Lymphatic and vascular invasion
8. Ancillary studies – State if tissue was sent.

For cytogenetics, molecular diagnostics follow cytometry or tissue banking.

MATERIALS AND METHODS

Selection of cases:

In this study, 50 patients who presented with swellings arising from soft tissue and bony regions with clinical suspicion of malignancy were selected randomly among those patients who got admitted in general surgery, orthopedic surgery and surgical oncology wards of Government Rajaji Hospital, Madurai. The cases were studied from October 2005 to October 2007. For all patients, representative samples were obtained by FNAC, core needle biopsy and in some cases, by open biopsy and sent for patholgocial examination.

In this study, only those tumours which are having high clinical suspicion of malignancy were selected. Benign appearing soft tissue and bony tumours were excluded from the study. Selection of patients was randomy done irrespective of age and sex. The age group of patients varied from 1 year to 70 years.

When diagnosis was obtained with core needle biopsy, in most of the cases open biopsy was deferred and was proceeded with definitive procedure.

On the day of admission, bleeding time & clotting time were checked. For all the subjected patients, tetanus prophylaxis also was given.

In all the patients subjected, simultaneously both the FNAC, and core needle biopsy was done and the samples were sent for pathological analysis

when the results are negative, inconclusive (or) not helping for grading of the tumour, open biopsy (Incisional or excisional) was resorted to.

All the tumours that have been biopsied by FNAC, Core needle biopsy or open biopsy were subjected to surgical procedures. The specimen excised also sent for HPE.

The results obtained from FNAC, coreneedle biopsy and open biopsy technique were compared with the results of the postoperative HPE.

Out of 50 cases studied, 46 cases were newly detected cases and 4 cases were recurrent lesions.

PROCEDURE ADOPTEID IN THE SUTDY:

FNAC: Fine needle aspiration was done with 10ml. disposable plastic syringe with 23 G needle.

An antiseptic solution was used for thorough cleaning of skin over the mass and the needle aspiration was done. Once the cells were dispersed on the slide, they were fixed with cytofix solution. The slides were sent to the pathology department after labeling. To have a detailed cytological study, aspiration was done from multiple sites and several slides were prepared.

Coreneedle biopsy:-

Following similar aseptic precautions, under local anaesthesia after making a small skin incision of 0.5 cm size, core needle biopsy done in multiple

planes with 14G biopsy needle with a slot of 2.5cm length. After withdrawing the needle the site was compressed to arrest possible hemorrhage. The samples were placed in bottles containing 10% formalin and sent for HPE.

Complications:

No major complications encountered in this study. For few vascular tumours like Angiosarcoma, slight haemorrhage was encountered after the biopsy procedure which was controlled by external compression for five minutes. Other wise all the procedures done in this study were uneventful.

OBSERVATIONS AND ANALYSIS

50 patients with mesenchymal tumours that are clinically appearing malignant are studied.

Out of which, male cases were 32 and female were 18, M:F= 1.66:1
Most of the patients were falling into the age group of 30 to 50 years.

Most of the commonly encountered mesenchymal tumours were aggressive fibromatosis, which constituted about 20% of total cases. The following is the composition of various tumours in the study.

Aggressive Fibromatosis	-	20%
Chondrosarcoma	-	12%
Malignant fibrous histiocytoma	-	12%
Synoviosarcoma	-	12%
Fibrosarcoma	-	8%
Rhabdomyosarcoma	-	8%
Malignant peripheral nervesheath Tumours	-	8%
Ewing’s Sarcoma	-	2%
Angiosarcoma	-	6%

Malignant Hemangioendothelioma	-	4%
Malignant Hemangio Pericytoma	-	4%
Desmoid Tumour	-	4%

The tumours commonly present in lower extremities (54%) followed by Trunk (24%), upper extremities (12%) Head and Neck (4%) and abdomen(6%).

COMPARISON OF RESULTS OBTAINED BY VARIOUS MODALITIES OF BIOPSY IN MESENCHYMAL TUMOURS

I REGARDING YIELD OF DIAGNOSIS:

a) FNAC - Positive in 26 cases (52%)

- Negative in 24 cases (48%)

b) Coreneedle biopsy - Positive in 46 cases (92%)

- Negative in 4 cases (8%)

c) Open biopsy/ Postoperative biopsy - Positive in all cases.

II REGARDING YIELD OF GRADING OF TUMOUR

a) FNAC - No grading possible

b) Core needle biopsy - Yield grading in 90% cases

Grade I - 45%

Grade II - 10%

Grade III - 45%

c) Open biopsy/

Post operative biopsy - Grade obtained in all cases

P.Value between FNAC and Coreneedle Biopsy for yield of diagnosis is 0.00023 (Significant)

DISCUSSION

As per literature, benign mesenchymal tumours out number malignant tumours by 100:1 in a hospital population and malignant mesenchymal tumours are commonly found in old age. 40% of affected are above 55 years of age.

Incidence is more common in males when compared to females, M:F = 1:5:1. They arise commonly from the extremities, followed by chest wall, mediastinum and retroperitoneum.

In my study, the incidence of malignant mesenchymal tumours is about 0.5% of the total admissions is surgical wards.

The age group commonly affected is between 30-50 years of age.

Incidence in males out numbered females by ratio of 1.66:1.

The site commonly involved is lower extremities (54%), followed by Trunk (24%) upper extremities (12%) Head and Neck (4%) and abdomen (6%).

1. In 1982, mankin et al evaluated 329 patients with malignant mesenchymal tumours, found FNAC to yield positive value in 76%, and concluded as grading could not be detailed, as sampling errors is high and found coreneedle biopsy to be yielding positive diagnostic results in 95% and grading rate was about 86%.
2. In 1992, Barth R.J. et al conducted a prospective study of value of corneedle biopsy and FNAC in diagnosis of soft tissue masses, and

concluded that coreneedle biopsy yielded positivity in 98% and FNAC in 94% granting of the tumour was obtained in 90% of the cases by coreneedle biopsy and not possible by FNAC.

3. However, in 1999, a study conducted by Kilpatrick et al, showed that diagnosis of the type of mesenchymal tumours and grading of the tumours can be obtained upto 92.5% in FNAC.

In my study, of the 50 cases studied. FNAC reveals the positive pathological diagnosis of tumour and its type in 52% of cases and was negative and inconclusive in 48% of cases. It was found not to have any help in grading of the tumour with the available facilities.

In contrast, coreneedle biopsy yielded positive pathological nature of the tumour and its types in 92% of cases, and was negative in 8% cases. Also it gave positive results in grading of tumours in 90% of cases, which can be comparable to other studies that have been conducted in the past. Open biopsy/post operative biopsy revealed the exact nature of diagnosis and grade of the tumour in all cases.

The negativity or inconclusiveness of the reports obtained by coreneedle biopsy regarding diagnosis and grading may be due to learning curve during this study.

AGE & SEX WISE DISTRIBUTION OF

VARIOUS MESENCHYMAL TUMOURS

IN THIS STUDY

S.NO	Name of Tumour	Total No.	Male	Female	Age Group	%
1	Chondrosarcoma	6	5	2	40-50	12
2	Malignant Fibrous Histiocytoma	6	3	3	50-65	12
3	Fibrosarcoma	4	2	2	40-60	8
4	Aggressive Fibromatosis	10	6	4	1-65	20
5	Synoviosarcoma	6	4	2	30-60	12
6	Rhabdomyosarcoma	4	4	0	15-60	8
7	Ewing's sarcoma	1	0	1	15-20	2
8	Malignant peripheral Nerve sheath tumours	4	3	1	10-45	8
9	Angio sarcoma	3	2	1	30-45	6
10	Malignant Hemangio-Pericytoma	2	1	1	30-40	4
11	Malignat Hemangio-Endothelioma	2	1	1	30-40	4
12	Desmoid Tumour	2	1	1	40-55	4
	Total	50	32	18		

In this sutdy Male patients outnumbered female patients in the ratio of 1.6:1 and aggressive fibromatorses were the commonest tumours.

REGIONWISE DISTRIBUTION OF VAIOURS MESENCHYMAL TUMOURS IN THIS STUDY

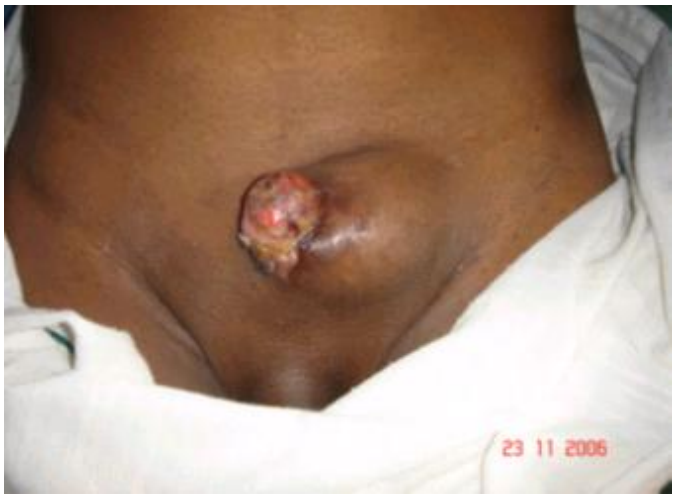
S	Name of Tumour	Head & Neck		Upper Extre.		Lower Extre.		Trunk Back & Perineum		Abdomen		total
		No	%	No	%	No	%	No	%	No	%	No
1	Chondrosarcoma	-	-	-	-	2	33.3	4	66.7	-	-	6
2	Malignant Fibrous Histiocytoma	-	-	2	33.3	2	33.	1	16.4	1	16.6	6
3	Fibrosarcoma	-	-	-	-	3	75	1	25	-	-	4
4	Aggressive Fibromatosis	2	20	-	-	8	80	-	-	-	-	10
5	Synoviosarcoma	-	-	2	33.3	4	66.7	-	-	-	-	6
6	Rhabdo myosarcoma	-	-	1	25	1	25	2	50	-	-	4
7	Ewing's sarcoma	-	-	-	-	-	-	1	100	-	-	1
8	Malignant peripheral Nerve sheath tumours	-	-	-	-	4	100	-	-	-	-	4
9	Angio sarcoma	-	-	1	33.3	2	66.7	-	-	-	-	3
10	Malignant Hemangio-Pericytoma	-	-	-	-	1	50	1	50	-	-	2
11	Malignat Hemangio-Endothelioma	-	-	-	-	-	-	2	100	-	-	2
12	Desmoid Tumour	-	- -	-	-	-	-	-	-	2	100	2
	Total	2	4	6	12	27	54	12	24	3	6	50

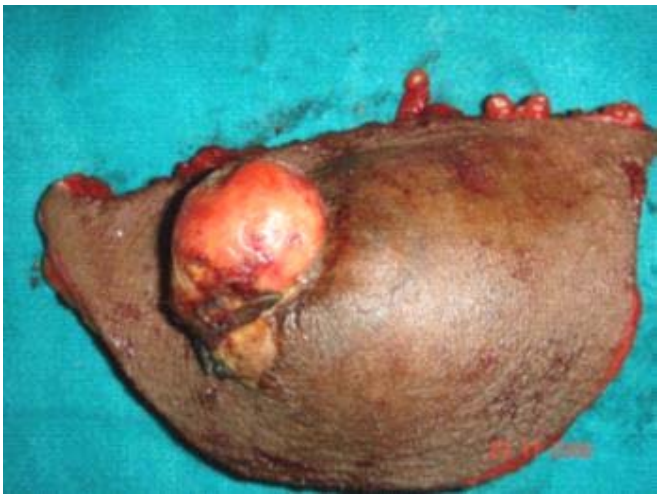
In this study tumours encountered commonly in lower extremities followed by trunk, upper extremities, abdomen and Head and Neck.

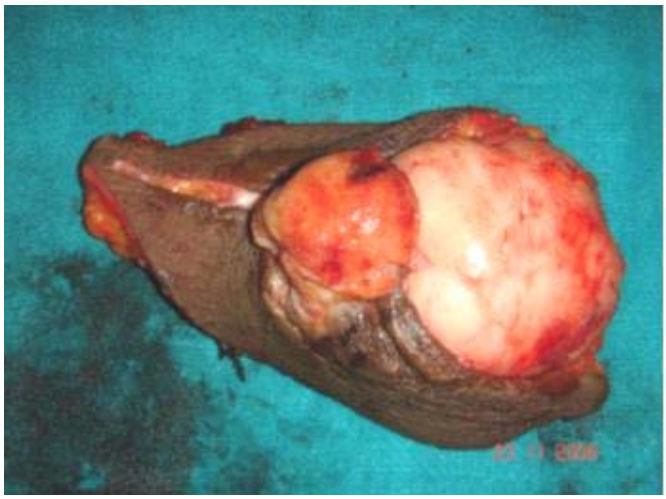
CONCLUSION

1. The demographic data of this study correlates well with the data observed by other studies.
2. open biopsy / post excisional biopsy forms the gold standard in establishing the diagnosis and grading of the tumour.
3. Coreneedle biopsy have higher value in establishing the diagnosis, compared to FNAC.
4. FNAC could not give any information regarding grading of the tumour and coreneedle biopsy gave grading, with a rate very close to open or post excisional biopsy.
5. Hence coreneedle biopsy can be accepted as the first line of investigation than FNAC for establishing the diagnosis and grading of mesenchymal tumours, on which the whole treatment planned upon.

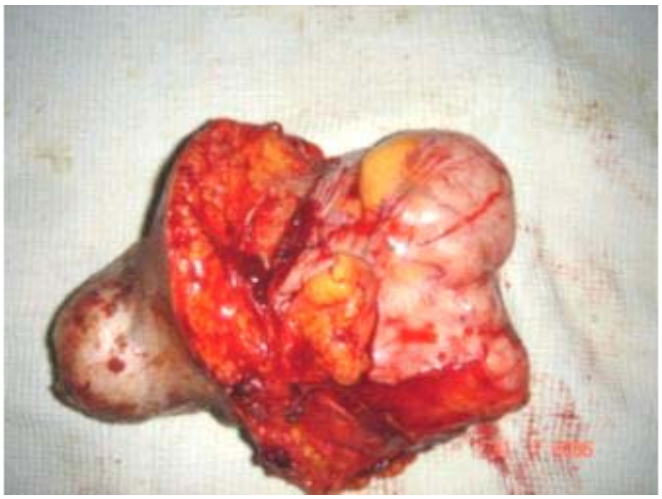
DERMATOFIBROMASARCOMA PROTRUBERANS

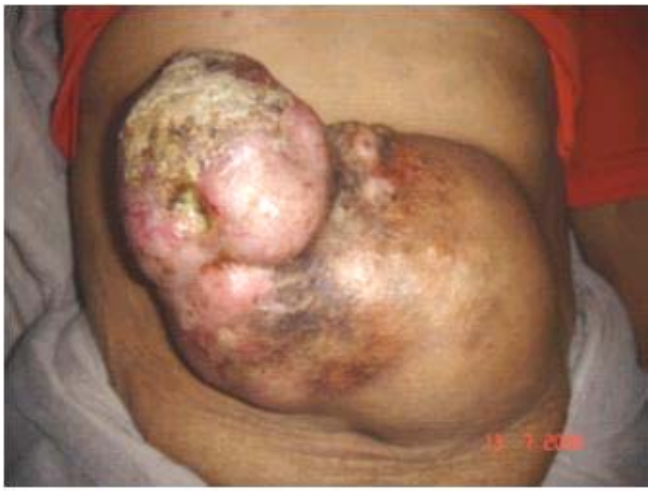






DESMOID TUMOR





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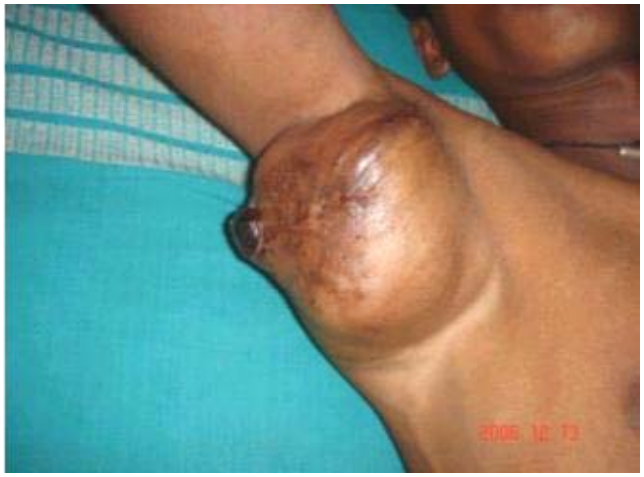

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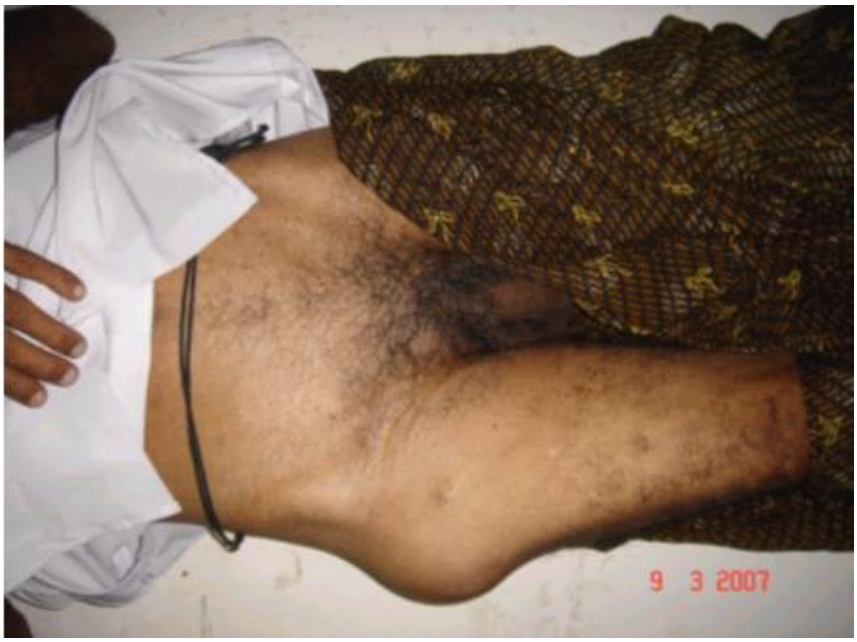
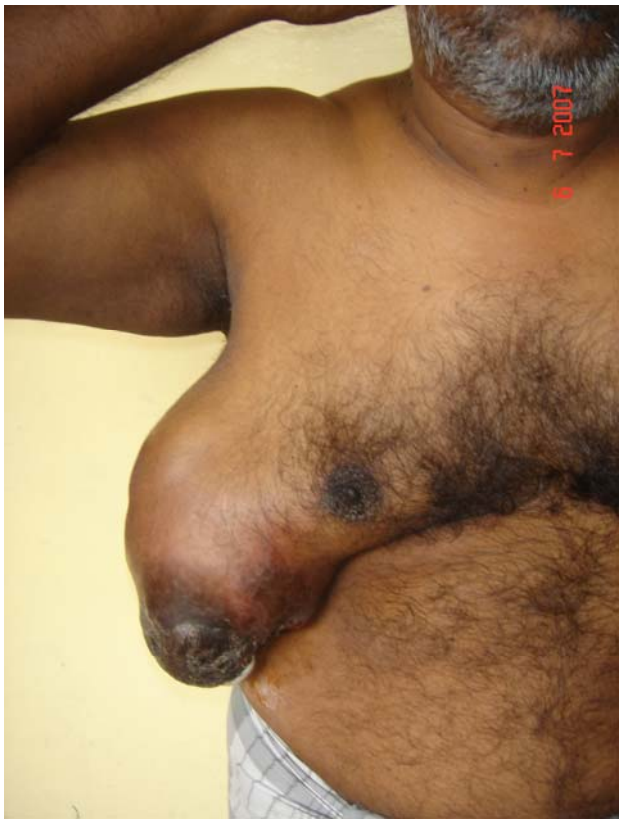
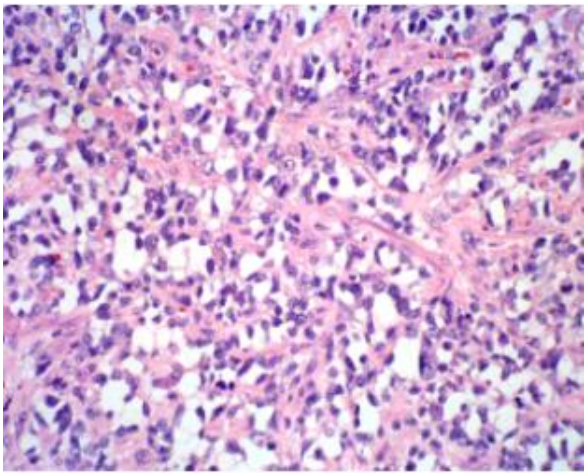


MALIGNANT FIBROUS HISTIOCYTOMA



ALVEOLAR RHABDOMYOSARCOMA



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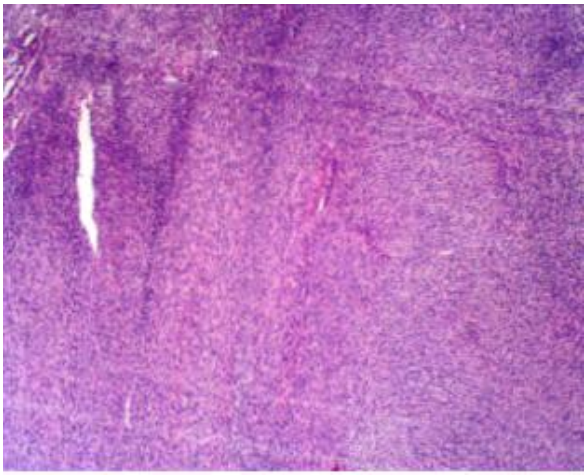
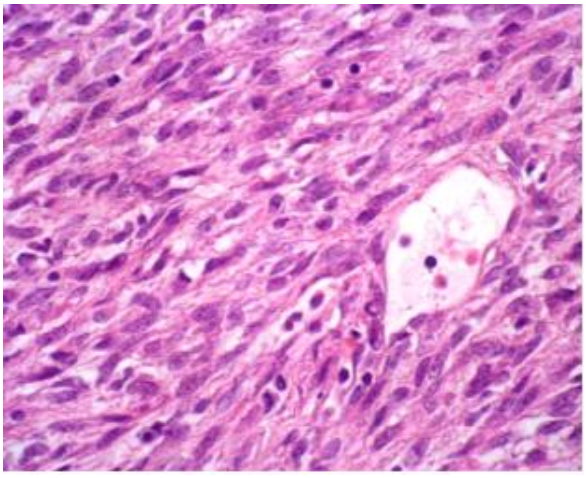


FIBROSARCOMA



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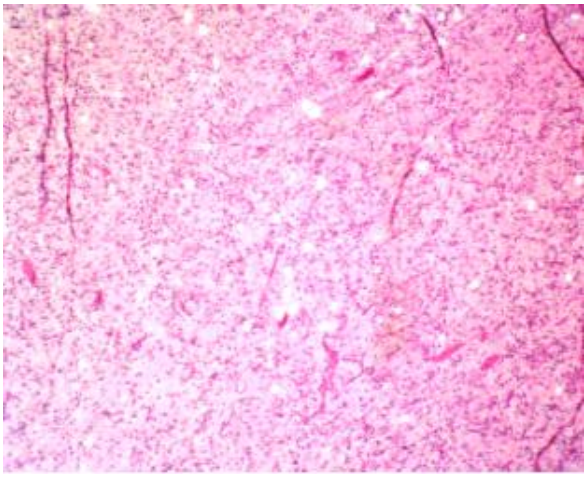

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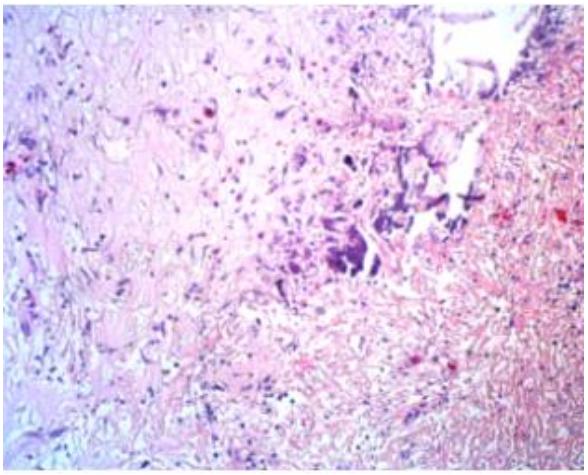
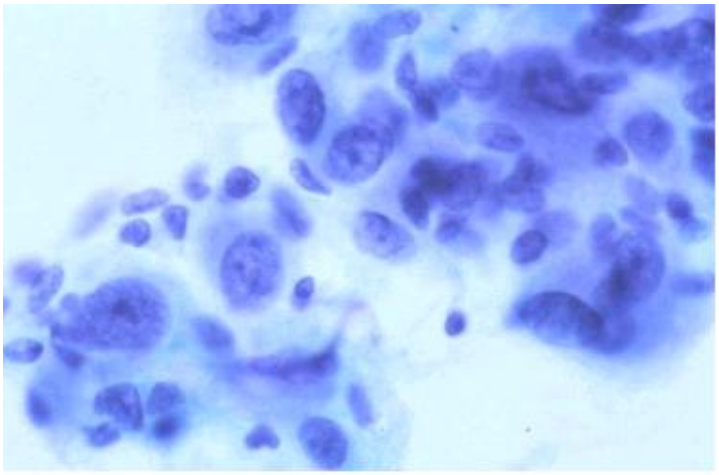


MALIGNANT FIBROUS HISTIOCYTOMA - CYTOLOGY



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SL.NO	NAME	AGE	SEX	SITE OF TUMOUR	CLINICAL DIAG.	GRADE	FNAC	CORENEEDLE BIOPSY	OPEN BIOPSY POST OP. HPE
1	Muthumani	30	F	R. Chest wall	Angiosarcoma	II	Inconclusive	Borderline HET	Grade II HET
2	Chockalingam	67	M	L.Back	Chondrosarcoma	II	Positive	Grade I C S.	Grade I C.S.
3	Sadayan	67	M	R. Chest wall	Fibrosarcoma	III	Negative	Poorly diff M.H.P	Grade III MHP
4	Sebastian	65	M	Abdomen	Fibrosarcoma	III	Positive	Poorly diff. MFH	Grade III MFH
5	Mokkammal	40	F	Abdomen	Desmoid tumour	I	Positive	DFS	DFS
6	Panchu	22	F	L.Foot	Synoviosarcoma	III	Positive	Negative	Grade III SS
7	Chinnasamy	42	M	L.Hip	Chondrosarcoma	I	Positive	Well diff. CS	Grade I C.S.
8	Sethuraja	32	M	R. Gluteal region	Fibrosarcoma	III	Negative	Poorly diff . AS	Grade III A.S
9	Dhanalakshmi	32	F	L.Leg	Synoviosarcoma	I	Negative	Biphasic SS	Grade I S.S
10	Perumal	60	M	L.Forearm	RMS	III	Positive	Undiff. Sarcoma	Grade III S.S
11	Muthukamatchi	58	M	L. Chest wall	Fibrosarcoma	I	Positive	Well diff. FS	Grade I F.S
12	Rajalakshmi	18	F	L.Back	Chondrosarcoma	III	Negative	Round cell sarcoma	Grade III E.S
13	Thangam	70	M	R. Chest wall	Fibrosarcoma	I	Positive	Well diff. CS	Grade I C.S.
14	Venugopal	50	M	L. Shoulder	Fibrosarcoma	I	Positive	Well diff. M.F.H	Grade I MFH
15	Pankajam	40	F	R.Thigh	Fibrosarcoma	III	Negative	Poorly diff. FMS	Grade III FS
16	Ramasamy	65	M	L.Thigh	Liposarcoma	I	Positive	Well diff MFH	Grade I MFH
17	Madhalai Karuppiah	38	M	R.Thigh	RMS	III	Negative	Poorly diff. MPNST	Grade III MPNST
18	Poormamuthu	14	M	L.Hip	Fibrosarcoma	I	Negative	Well diff. FS	Grade I MPNST

SL.NO	NAME	AGE	SEX	SITE OF TUMOUR	CLINICAL DIAG.	GRADE	FNAC	CORENEEDLE BIOPSY	OPEN BIOPSY POST OP. HPE
19	Karutha Oyyan	60	M	L.Forearm	Fibrosarcoma	III	Positive	High grade RMS	Grade III RMS
20	Thiagarajan	16	M	R.Chestwall	RMS	III	Positive	Well diff. RMS	Grade III RMS
21	Doulath Begam	19	F	L.Thigh	Fibrosarcoma	-	Negative	AF	AF
22	Anandhavalli	30	F	R.Thigh	Fibrosarcoma	-	Negative	AF	AF
23	Kadirvel	30	M	L.Hip	Angiosarcoma	III	Inconclusive	Poorly diff. MHP	Grade III MHP
24	Nagaraj	31	M	L.Leg	Fibrosarcoma	-	Negative	AF	AF
25	Rakku	45	F	L.Chestwall	Chondrosarcoma	I	Positive	Well diff. CS	Grade ICS
26	Anusuya	1	F	R.Gluteal region	Fibrosarcoma	-	Negative	AF	AF
27	Murugan	40	M	L.Back	Fibrosarcoma	II	Negative	Borderline MHE	Gr. II MHE
28	Adam Baba	65	M	R.Face	Fibrosarcoma	-	Negative	AF	AF
29	Palaniammal	59	F	L.Thigh	Fibrosarcoma	III	Positive	Poorly diff. MFH	Gr. III MFH
30	Ramasamy	55	M	Ant. Abd.Wall	Desmoid tumour	I	Positive	Well diff. DFS	Gr. I DFS
31	Jeeva	32	M	R.Leg	Synoviosarcoma	II	Positive	Borderline SS	Gr. II SS
32	Senthil	34	M	R. Shoulder	Synoviosarcoma	III	Negative	Negative	Gr. III SS
33	Thayalan	52	M	L. Back	Chondrosarcoma	I	Positive	Well Diff.CS	Gr.I CS
34	Riaz	45	M	R.Arm	Fibrosarcoma	III	Negative	Poorly diff AS	Gr III AS
35	Pandian	48	M	R.Leg	Fibrosarcoma	I	Positive	Well diff. FS	Gr I AS
36	Shanmugam	45	M	R.Gluteal region	RMS	III	Positive	Poorly diff, SS	Gr. III SS

SL.NO	NAME	AGE	SEX	SITE OF TUMOUR	CLINICAL DIAG.	GRADE	FNAC	CORENEEDLE BIOPSY	OPEN BIOPSY POST OP. HPE
37	Pappammal	50	F	L.Foot	Fibrosarcoma	I	Positive	Well diff, FS	Gr. I FS
38	Otchathevar	50	M	R.Hip	Fibrosarcoma	I	Positive	Well diff, CS	Gr. I CS
39	Balu	30	M	R.Thigh	Chondrosarcoma	III	Negative	Round cell sarcoma	Gr.III RMS
40	Sudha	28	F	R.Thigh	Fibrosarcoma	-	Negative	AF	AF
41	Ramachandran	36	M	L.Neck	Fibrosarcoma	-	Negative	AF	AF
42	Rakkammal	62	F	R.Leg	Fibrosarcoma	I	Positive	Well diff, MFH	Gr. I MFH
43	Krishnasamy	38	M	L.Gluteal region	Fibrosarcoma	-	Negative	AF	AF
44	Santhi	42	F	L.Leg	RMS	III	Negative	Poorly diff. AS	Gr. III AS
45	Lakshmi	37	F	L.Thigh	RMS	III	Negative	Poorly diff. MPNST	Gr. III MPNST
46	Raja	40	M	R.Thigh	Fibrosarcoma	-	Negative	AF	AF
47	Sundarammal	54	F	R.Back	Liposarcoma	I	Positive	Well diff. M.F.H	Gr. I MFH
48	Gopal	51	M	L.Leg	Fibrosarcoma	-	Negative	Negative	AF
49	Ramesh	22	M	R.Back	RMS	III	Positive	High grade RMS	Gr. III RMS
50	Dinesh	19	M	R.Gluteal region	Neurofibroma	I	Negative	Negative	Gr. I NFS

PROFORMA

S. No. :

Name : **Age :** **Sex :**

Address :

I.P.No: **Ward:**

Economic Status :

Clinical History:

Investigation: Blood – Hb%, TC, DC, ESR, BT, CT

-Urine - Albumin, Sugar, Deposits

- X-ray Chest (PA) View:

Local Parts

USG Abdomen

CT Scan

Site of the Swelling

Clinical Diagnosis

FNAC Report

TRUCUT Biopsy Report

Treatment

Post operative HPE

Adjuvant Rx

Remarks