RESULTS

Fifty cases of soft tissue sarcomas examined in this study were classified into two groups; the first is formed of (37) cases (74%) classified as differentiated soft tissue sarcomas [7 liposarcomas (14%) , 8 fibrosarcomas (10%) , 7 malignant fibrous histocytomas (M.F.H) (14%), 10 leiomysarcomas (20%) and 5 rhabdomyosarcomas (10%)] . The second group is formed of 13 cases (26%) of undifferentiated sarcomas .

Twenty five cases of normal soft tissue component were used as control (5 were adipose tissue, 5 were fibrous tissue, 5 were smooth muscle, 5 were skeletal muscle and 5 were myxoid tissue).

The histopathological classification of the cases in the study group were illustrated in table (4) .

The sex and age of all cases were illustrated in table (5) .

The control group :

The histochemical study of the control group by different stains is shown in table (6) :

Reticulin stain : Stained reticulin fibers black .

Trichrom stain : Stained myofibrils red and collagen green

P.A.S stain : Stained basement membrane of capillary blood vessel red and glycogen magenta red .

Alcian blue stain : Stained acid mucopolysaccharides blue .

Table (5) : Sex and age distribution in all cases :

Diagnosis	No. of cases	Sex		Age	
		Sex (F)	Sex (M)	Range	Mean
I-Differentiated cases of S.T.S					
1- Liposarcomas	7	4	3	43-65	52.5
2- Fibrosarcomas	8	3	5	42-75	48
3- M.F.H	7	2	5	30-60	45.1
4-Leiomyosarcomas	10	7	3	40-60	55
5- Rhabdomyosarcomas	5	1	4	4-25	14.75
II- Undifferentiated S.T.S	13	6	7	8-64	34.4
Total	50	23	27	4-75	41.63

Table (6) : The histochemical study of different stains in control group :

Stains	Fibrous tissue	Blood vessels	Myxoid tissue	Smooth muscle	Skeletal muscle
Reticulin	(+ +) Around blood vessels + Around cells (Black)	(+ +) Around blood vessels (Black)	(- -)	(+ +) Around cells (Black)	(+ +) Around cells (Black)
Masson Trichrome	(+ +) Collagen bundle between cells (Green)	(- -)	(- -)	(+ +) Striation in cytoplasm (Red)	(+ +) Striation in cytoplasm (Red)
P.A.S.	(- -)	(+ +) Basement membrane (Red)	(- -)	(+ +) Glycogen in cytoplasm (Red)	(+ +) Glycogen in cytoplasm (Red)
Alcian blue	(- -)	(- -)	(+ +) In matrix (Blue)	(- -)	(- -)

Argyrophilic Nucleolar oraganizer (AgNORs) study :

The AgNORs was clearly defined as nucleolar brown black dots which were small, rounded, dense and uniform in size and shape (figure 1).

Its count / cell ranged from 1-2 dots with mean 1.1 and SD ± 0.1.

I- Liposarcomas

Histopathological study :

Seven out of 50 cases (14%) were liposarcomas of which 4 cases were from lower limbs (thigh) and 3 cases from retroperitoneal regions.

The subtypes of the seven cases were :

2 Cases	Myxoid type
One Case	Round cell type
2 Cases	Well differentiated types :
	" One sclerotic "
	" One inflammatory "
2 Cases	Pleomorphic type

The two cases of myxoid liposarcomas showed lobular pattern. The tumor lobules composed of proliferative stellate shaped cells with indistinct cell membrane lying in mucoid background with lakes of mucoid matrix and thin fibrous tissue surrounding the lobules. The vascular pattern was that of chicken wire arrangement (Figure 2) . Few foci of spindle shaped cells were seen. The nucleoli were not hyperchromatic or atypical showing no pleomorphism nor significant mitosis .

The case of round cell type is composed of proliferating small round cells with vesicular nuclei and the cells are arranged in cords or rows. Some lipoblasts and few giant cells were seen scattered in the matrix (Figure 3). Nuclear mitosis was low. Vascularity was low in the form of branching thin walled vessels of uniform size . Few collagen bundles could be seen. Also, small areas of necrosis and hemorrhage .

The case of sclerotic well differentiated liposarcoma consisted of scattered multivacuolated lipoblast, large vacuolated cells with signet ring shaped simulate lipoma cells were present within groups and alternate with collagen bundles varying in density. Spindle shaped cells " Fibroblast – like " were seen within the collagen. No giant cells nor mitotic figure were seen .

The case of inflammatory well differentiated liposarcoma is composed of large cells resembling cells of adult fat " Lipoma – like area " with signet ring nuclei. Scattered lipoblasts with one or more hyperchromatic nuclei and small nests of multivacuolated cells were seen. The matrix of the tumor was infiltrated by inflammatory cells consisting of variable number of lymphocytes and plasma cells (Figure 4) .

The two cases of pleomorphic liposarcomas consisted of sheets of pleomorphic tumor cells; some of which were giant cells with deeply acidophylic cytoplasm. Univacuolated, multivacuolated and bizzare lipoblasts were frequent. Signet ring lipoblasts were few. The cells had one or more lipid droplets in the cytoplasm causing scalloping of nuclei (Figure 5) . Areas of hemorrhage and necrosis were frequent . The stroma was very vascular . Mitotic figures were high (Figure 6) .

The histochemical stains : (Table 7)

Reticulin stain showed fibrillary reticulin meshwork which was wrapped about the vascular channels (Figure 7) . It was clearly shown in both myxoid and pleomorphic liposarcomas cases.

P.A.S stain demonstrated the capillary basement membrane which also was cleared in cases of myxoid and pleomorphic lipsarcomas (Figure 8).

Only the sclerotic well differentiated liposarcoma was strongly positive for the trichrom stain which demonstrated the collagen bundles .

The mucinous matrix was positively stained by alcian blue stain. It was more diagnostic in myxoid liposracoma (Figure 9).

The immunohistochemical study in liposarcomas :

The immunohistochemical studies of all cases of liposarcomas were summarized in (Table 9) :

The tumor cells in liposarcomas cases (7) revealed positive staining with antivimentin antibodies (100%) which appears as diffuse brown intracytoplasmic stain . Both alpha –1- antitrypsin and desmin were negative in the seven cases (Figure 11).

Table (9) : The total immunohistochmical study of different antibodies used in liposracomas :

Histopathological diagnosis	Immunohistochmical reactions		
	Vimentin	Alpha –1- antitrypsin	Desmin
Myxoid	(+ + +)	(- - -)	(- - -)
Myxoid	(+ + +)	(- - -)	(- - -)
Round cell	(+ +)	(- - -)	(- - -)
Well differentiated	(+ + +)	(- - -)	(- - -)
Pleomorphic	(+ +)	(- - -)	(- - -)
Well differentiated	(+ + +)	(- - -)	(- - -)
Pleomorphic	(+ +)	(- - -)	(- - -)
Total count of positive cases	(7) 100%	0	0

(+) , Mild staining ; (+ +) , Moderate staining ; (+ + +), Severe staining ; (- - -) No staining .

The intensity for antivimentin antibodies was marked with the myxoid and well differentiated cases .

II- Fibrosarcomas

*** Histopathological study :**

Eight out of 50 cases (16%) were fibro-sarcomas of which 4 cases were from the lower extermities (thigh), 2 cases from neck and 2 cases from the retroperitoneal regions .

The subtypes of the eight cases were

3 cases	well differentiated .
2 cases	moderately differentiated .
3 cases	poorly differentiated .

The three cases of well differentiated fibrosarcomas showed neoplastic cells which were spindle shaped or ovoid in some areas with ill defined cytoplasmic border, spindle shaped nuclei showing moderate variation in size and shape . Few mitotic forms could be seen. The tumor revealed a well differentiate degree with cellular arrangement in intersecting fascicles to give the characteristic " herring bone " fashion . Thick collagen bundle separating tumor cells could be seen .

In the three cases of intermediate differentiated fibrosarcomas , the tumor cells revealed a moderate degree of differentiation with cellular arrangement in intersecting fascicles giving the characteristic " herring bone " fashion in few areas . The tumor was notably cellular . Neoplastic fibroblasts were spindle shaped or ovoid with ill defined cytoplasmic borders and rounded nuclei which were moderately variable in size and shape with high mitotic index (Figure 12) . Moderately collagen bundles separated the tumor cells .

The three poorly differentiated cases, were closely packed " highly cellular " with ovoid or rounded nuclei . The " herring bone " pattern was less

Argyrophilic nucleolar organizer (AgNORs) study of fibrosarcomas:

* The morphological picture of (AgNORs) in all types of fibrosarcomas were similar to those in liposarcomas (Figure 15).

* AgNORs count / cell in cases of fibrosarcomas ranged between 4.56 – 8-90 (The mean = 6.01 ; SD ± 1.99) (Table 11) .

Table (11) : The mean AgNORs count / cell in different subtypes and grades in fibrosarcomas :

Histopathological subtypes and grade	No. of cases	Range of AgNORs count / cell	Mean AgNORs count / cell	SD
• **Low grade :** (Well differentiated)	3	4.60-5. 40	5.00	± 0.57
• **Intermediate grade:** (Moderately differentiated)	2	4.56-4.90	4.73	± 0.24
• **High grade :** (Poorly differentiated)	3	7.50-8.90	8.30	± 0.72
* Total	8	4.56-8.90	6.01	± 1.99

From the above results there is marked significant difference in AgNORs count / cell in high grade compared with both low and intermediate grades. There is no significant correlation between AgNORs count / cell in low and intermediate grades .

The immunohistochemical study in fibrosarcomas :

The immunohistochemical studies of all cases of fibrosarcomas were summarized in (Table 12) .

The tumor cells in fibrosarcoma cases (8) revealed positive staining with antivimentin antibodies (100%) which appears as diffuse brown intracytoplasmic stain. Both alpha-1- antitrypsin and desmin were negative in all eight cases (Figure 16).

Table (12) : The total immunohistochmical study of different antibodies used in fibrosracomas :

Histopathological diagnosis	Immunohistochmical reactions		
	Vimentin	Alpha –1- antitrypsin	Desmin
Well differentiated	(+++)	(---)	(---)
Well differentiated	(+++)	(---)	(---)
Well differentiated	(+++)	(---)	(---)
Moderately differentiated	(+++)	(---)	(---)
Moderately differentiated	(+++)	(---)	(---)
Poorly differentiated	(++)	(---)	(---)
Poorly differentiated	(++)	(---)	(---)
Poorly differentiated	(++)	(---)	(---)
Total count of positive cases	(8) 100%	0	0

(+) , Mild staining ; (+ +) , Moderate staining ; (+ + +), Severe staining ; (- - -) No staining .

The intensity for antivimentin antibodies was marked with well differentiated and moderately differentiated subtypes .

III- Malignant fibrous histocytoma (M.F.H.)

• Histopathological study :

Seven out of 50 cases (14%) were M.F.H. of which 4 cases were from lower extermities (thigh), , one case from the left shoulder, one from the retroperitoneum and one from the trunk .

The subtype of the seven cases were :

5 cases	storiform – pleomorphic
2 cases	myxoid

The five cases of storiform – pleomorphic M.F.H. revealed of admixture of malignant appearing spindle shaped fibroblasts and round to oval histocytic cells. In some areas (storiform area), the spindle shaped–cells were arranged in short fascicles or in cart-wheel pattern (Figure 17)

The tumor cells were closely packed " highly cellular " . The pleomorphic areas contained plump of fibroblasts and rounded histocytic cells arranged haphazardly without any particular orientation. Marked degree of cellular anaplasia, pleomorphism and abnormal mitotic figures were prominent (Figure 18). Areas of hemorrhage and necrosis were frequent . Inflammatory cells, mainly lymphocytes, plasma cells and eosinophils were seen admixed with neoplastic cells. Multinucleated, binucleated and bizarre pleomorphic giant cells with multiple irregular nuclei were frequently seen in many areas .

The two cases of myxoid type showed wide hypocellular areas in association with compact cellular areas. In hypocellular areas, both the

histocytes and fibroblasts were separated by clear basophilic mucinous matrix . Some of the cells were well differentiated and others were pleomorphic . The storiform was less evident and the vasculature was prominent with evident plexiform pattern. Abnormal mitosis , areas of hemorrhage and necrosis were seen .

The histochemical stains : Table (13):

Reticulin stain revealed moderate amount of reticulin fibers surrounding the individual cells, clearly shown in storiform pattern (Figure 19) .

Trichrome stain demonstrated delicate collagen fibers separating the tumor cells in storiform subtype (Figure 20) .

P.A.S. stain showed the capillary basement membrane in both storiform and myxoid subtypes .

Alcian blue stain revealed positive myxoid matrial was seen in myxoid type (Figure 21) .

Table (13) : The histochemical stains in the (7) cases of M.F.H. :

Diagnosis	No. of cases	Histochemical stains			
		Rt.	M. Tri.	Alc. B	P.A.S
Storiform pleomorphic	5	(++) A.C	(+) C.	(---)	(++) C.B.M
Myxoid	2	(+) A.C	(---)	(+++) M	(++) C.B.M

(+) , Mild (not diagnostic) ; (++) Moderate (aid in diagnosis) ; (+++) Severe (diagnostic); (- - -) No staining

AC. = Around cells .

C.B.M. = Capillary basement membrane .

M = Myxoid .

C = Collagen .

The stains = Rt = Reticulin M. Tri. = Masson Trichrome.

Alc. B. = Alcian blue P.A.S. =Periodic acid–Schiff stain .

Argyophilic nuclealar organizer (AgNORs) in M.F.H. :

- The morphological picture of AgNORs in all types of M.F.H. were as those in liposarcomas (Figure 22).
- AgNORs count / cell in cases of M.F.H. ranged between 4.36 – 9.50 . (The mean = 6.72 ; SD ± 2.33) (Table 14) .

Table (14) : The mean AgNORs count / cell in different subtypes and grades in fibrosarcomas :

Histopathological subtypes and grade	No. of cases	Range of AgNORs count / cell	Mean AgNORs count / cell	SD
• **Low grade :** (Myxoid))	2	4.36-4. 80	4.58	± 0. 31
• **Intermediate grade:** (Storiform pleomorphic)	2	6.32-6.42	6.37	± 0.07
• **High grade :** (Storiform pleomorphic) (More pelomorphic)	3	8.90-9.50	9.20	± 0.30
* Total	7	4.36-9.50	6.72	± 2.33

From the above results, there is significant correlation between increasing AgNORs count / cell and grade of M.F.H.

The immunohistochemical study in M.F.H. :

-The immunohistochemical study of all cases of M.F.H. were summarized in (Table 15) .

The tumor cells in M.F.H. cases (7) revealed positive staining with alpha-1- antitrypsin antibodies (100%) (Figure 24) and antivimentin antibodies (100%) (Figure 23) . Both markers appears as diffuse brown intracytoplasmic stain. Desmin only was negative in the seven cases .

Table (15) : The total immunohistochmical study of different antibodies used in M.F.H. :

Histopathological diagnosis	Immunohistochmical reactions		
	Vimentin	Alpha –1- antitrypsin	Desmin
- Myxoid	(+++)	(+++)	(---)
- Myxoid	(+++)	(+++)	(---)
- Storifrom pleomorphic	(+++)	(+++)	(---)
- Storifrom pleomorphic	(+++)	(+++)	(---)
- Storifrom pleomorphic (more pleomorphic)	(+++)	(+++)	(---)
- Storifrom pleomorphic (more pleomorphic)	(+ ++)	(+ ++)	(---)
- Storifrom pleomorphic (more pleomorphic)	(++ +)	(++ +)	(---)_
Total count of positive cases	(7) 100%	(7) 100%	0

(+) , Mild staining ; (+ +) , Moderate staining ; (+ + +), Severe staining ; (- - -) No staining .

The intensity for antivimentin and anti apha-1- antitrypsin antibodies were marked in all cases . Desmin was not detected in all cases

IV-Leiomyosarcomas

Histopathological stady :

Ten out of 50 cases were leiomyosarcomas (20%) , of which 5 cases were from subcutaneous tissue 3 cases from retroperitoneum and 2 cases from head and neck regions .

The subtypes of the ten cases were :

5 cases well differentiated

5 cases poorly differentiated

The five cases of well differentiated leiomyosarcoma were highly cellular forming fascicles of intersecting bundles of spindle shaped cells having pink fibrillated cytoplasm . The cells showed centrally located cigar shaped blunt ended nuclei .

In poorly differentiated cases , the nuclei were large , hyperchromatic and with prominent nucleoli . Bizarre shaped and multinucleated giant cells were frequently seen in all fields . Areas of hyaline degeneration and foci of myxomatous change were present . The mitotic figures were more than 5-10 / 10 H.P.F. nuclear palisading was focally identified . Areas of necrosis were shown . Epithelioid like cells appear with its rounded shape were seen in one case only (Figure 25) .

-Histochemical study : Table (16) :

Reticulin stain revealed reticulin fibers surrounding the tumor cells individually, in fascicles and in groups (Figure 26) .

P.A.S stain demonstrated glycogen deposit through out the cytoplasm of tumor cells (Figure 27) .

Myofilaments could be seen by trichrome stain intracytoplasmic (Figure 28).

Alcian blue stain demonstrated few focal areas of myxoid change.

Table (16): The histochemical stains in the (10) cases leiomyosarcomas :

Diagnosis	No. of cases	Histochemical stains			
		Rt.	M. Tri.	Alc. B	P.A.S
Well differentiated	5	(+++) A.C	(+++) I.C.M	(+) M	(++ +) I.C.G
Poorly differentiated	5	(++ +) A.C.	(++) I.C.M.	(+) M	(+++) I.C.G.

(+) , Mild (not diagnostic) ; (++) Moderate (aid in diagnosis) ; (+++) Severe (diagnostic); (- - -) No staining

AC. = Around cells .

I.C.M. = Intracytoplasmic myofibrils .

I.C.G. = Intracytoplasmic glycogen .

M = Myxoid .

The stains = Rt = Reticulin M. Tri. = Masson trichrome

= Alc. B. = Alcian blue . P.A.S. =Periodic acid–Schiff stain .

Argyrophilic nucleolar organizer (AgNORs) study in leiomyosracomas :

- The morphologic picture of AgNORs in all types of leiomyosarcomas were as those in liposarcomas (Figure 29) .
- AgNORs count / cell in cases of leiomyosarcomas ranged between 5.08-9.50 (the mean = 6.11 ; SD ± 1.24) (Table 17).

Table (17) : The mean AgNORs count / cell in different subtypes and grades in leiomyosarcomas :

Histopathological subtypes and grade	No. of cases	Range of AgNORs count / cell	Mean AgNORs count / cell	SD
• **Low grade :** (Well differentiated)	1	5.00	5.00	-
• **Intermediate grade:** (Well differentiated)	4	5.08-6.80	5.89	± 0.71
• **High grade :** (Poorly differentiated)	5	5.45-9.50	7.45	± 1.47
* Total	10	5.08-9.50	6.11	± 1.24

From the above results, there is significant correlation between increasing mean AgNORs count / cell and grade of leiomyosarcomas as the AgNORs count / cell increase with progression of the grade.

The immunohistochemical study in leiomyosarcomas :

The immunohistochemical studies of all cases of leiomyosarcomas were summarized in (Table 18) :

The tumor cell in all cases of leiomyosrcaomas (10) revealed positive staining with antivimentin (100%) (Figure 30) and antidesmin antibodies (100%) (Figure 31), both appeared as diffuse brown intracytoplasmic stain .

The alpha-1- antitrypsin was negative in all cases (10 cases) .

Table (18) : The total immunohistochmical study of different antibodies used in leiomyosracomas:

Histopathological diagnosis	Immunohistochmical reactions		
	Vimentin	Alpha –1- antitrypsin	Desmin
- Well differentiated	(+++)	(---)	(+++)
- Well differentiated	(+++)	(---)	(+++)
- Well differentiated	(+++)	(---)	(+++)
- Well differentiated	(+++)	(---)	(+++)
- Well differentiated	(+++)	(---)	(+++)
- poorly differentiated	(+ ++)	(---)	(+ ++)
- Poorly differentiated	(++ +)	(---)	(++ +)
- Poorly differentiated	(+++)	(---)	(+++)
- Poorly differentiated	(+++)	(---)	(+++)
- Poorly differentiated	(+++)	(---)	(+++)
Total count of positive cases	10 (100%	0	10 (100%)

(+) , Mild staining ; (+ +) , Moderate staining ; (+ + +), Severe staining ; (- - -) No staining .

The intensity of both antivimentin and anti desmin antibodies were equally marked in all cases .

IV- Rhabdomyosarcomas

Histopathological study :

Five out of 50 cases were rhabodmysaromas (10%) , of which one case was from the trunk , one case from the neck, one case from the retroperitoneum and 2 cases from the extremities (thigh) .

The subtypes of the five cases were :

3 cases	embryonal rhabdomyosarcomas
2 cases	alveolar rhabdomyosarcomas

The three cases of embryonal rhabdomyosarcomas showed considerable variation in cellularity . Hypercellular and densely packed areas surrounding blood vessels alternated with less cellular areas which showed abundant mucoid intercellular material . The tumor tissue consisted of embryonal rhabdomyoblasts arranged in masses and trabeculae and separated by fibro-vascular connective tissue .

Two cases were better differentiated and composed of differentiated rhabdomyoblasts . Their cells were oval to round with distinct eosinophilic cytoplasm . These cells were mainly mononuclear but binucleate cells were found . Spindle shaped cells with abundant cytoplasm and two cytoplasmic processes were scattered throughout the tumor tissues . Multinucleate giant cells, elongated ribbon shaped cells or strap-shaped rhabdomyoblast with one or two central nuclei and peripherally placed myofilaments were found. Racquet shaped cells and tadpole – shaped rhabdomyoblasts with a single round nucleus at the expanded end were frequent (Figure 32) .

One case was poorly differentiated . It was formed of small round and oval shaped cells with darkly staining hyperchromatic nuclei and indistinct cytoplasm. The nuclei varied in size and showed small nucleoli . Abnormal mitosis were frequent . In few foci-the rhabdomyoblasts were spindle shaped cells .

The two alveolar rhabdomyosarcomas were formed of ill defined groups and nests of small round to oval cells that were occasionally elongated. Dense and hyalinzed fibrous trabeculae were formed at the periphery of the cell nests.

The neoplastic cells were filling an alveolar like spaces . The tumor cells in contact with these fibrous strands were firmly attached to the trabeculae but the cells in the center of the alveoli were more loosely arranged or freely floating. At the growing end of the tumor, the tissue was mainly of solid pattern and the tumor cells lacked the alveolar arrangement . The individual cells were deeply acidophylic and demonstrated variation in cell and nuclear size.Multinucleated cells and few racquet shaped cells were found (Figure33).

The histochemical study : Table (19) :

Reticulin preparation showed minimal amount of reticulin fibers around the tumor cells individualy and in groups . It also demonstrated the reticulin fibers around the alveoli (Figure 34).

P.A.S. stain revealed the presence of intracytoplasmic glycogen (Figure 35).

Trichrome stain showed deeply stained red cytoplasm (Figure 36 & 37).

Alcian blue stain showed few foci of myxoid tissue .

Table (19) : The histochemical stains in the (5) cases rhabdomyosarcomas:

Diagnosis	No. of cases	Histochemical stains			
		Rt.	M. Tri.	Alc. B	P.A.S
Embryonal	3	(+) A.C	(+++) I.C.M	(+) M	(+++) I.C.G
Alveolar	2	(++)) A.C.	(+++) I.C.M.	(---)	(++) I.C.G.

(+) , Mild (not diagnostic) ; (++) Moderate (aid in diagnosis) ; (+++) Severe (diagnostic); (- - -) No staining

AC. = Around cells .

I.C.M. = Intracytoplasmic myofibrils .

I.C.G. = Intracytoplasmic glycogen .

M = Myxoid .

The stains = Rt = Reticulin M. Tri. = Masson trichrom
= Alc. B. = Alcian blue . P.A.S. =Periodic acid–Schiff stain

Argyrophilic nucleolar organizer (AgNORs) study in rhabdomyosarcomas :

- The morphologic picture of AgNORs in all cell types of rhabdomyosarcomas were similar to those in liposarcomas (Figure 38).
- AgNORs count / cells in cases of rhabdomyosarcomas ranged from 6.90-9.50 (the mean = 8.40 ; SD = ± 1.10 (Table 20).

Table (20) : The mean AgNORs count / cell in different subtypes and grades in rhabdomyosarcomas :

Histopathological subtypes and grade	No. of cases	Range of AgNORs count / cell	Mean AgNORs count / cell	SD
• **High grade :**	5	6.90-9.50	8.40	± 1.10
(embryonal)	3			
(alveolar)	2			
* Total	5	6.90-9.50	8.40	± 1.10

From the above table AgNORs count / cell in rhabdomyosarcomas were nearly the same in both embryonal and alveolar type .

The immunohistochemical study in rhabdomyosarcomas :

The immunohistochemical studies of all cases of rhabdomyosarcomas were summarized in (Table 21) .

The tumor cells in rhabdomyosarcomas (5) cases revealed positive staining with antivimentin (100%) (Figure 40) and antidesmine (100%) antibodies (Figure 39). Both markers appear as diffuse brown intracytoplasmic stain . The alpha-1- antitrypsin was negative in all cases .

Table (21) : The total immunohistochmical study of different antibodies used in leiomyosracomas:

Histopathological diagnosis	Immunohistochmical reactions		
	Vimentin	Alpha –1- antitrypsin	Desmin
- Embryonal	(+++)	(---)	(+++)
- Embryonal	(+++)	(---)	(+++)
- Embryonal	(+++)	(---)	(+++)
- Alveolar	(+++)	(---)	(+++)
- Alveolar	(+++)	(---)	(+++)
Total count of positive cases	5 (100%	0	5 (100%)

(+), Mild staining ; (++), Moderate staining ; (+++), Severe staining ; (---) No staining .

The intensity of both antivimentin and anti desmin antibodies were marked in all cases .

The immunohistochemical study for 5 cases of rhabdomyosarcomas and 10 cases of leiomyosarcomas revealed positivity to desmin and vimentin:

So, to differentiate the tow groups , alpha-smooth muscle actin (A.S.M.A.) was applied to the 15 cases of rhabomyosarcomas and leiomyosarcomas .

The immunohistochemical study in cases of rhabdomyosarcomas and leiomyosarcoams (15) cases :

The tumor cells in leiomyosarcoma (10) reveled positive staining with anti-alpha smooth muscle actin (A.S.M.A.) (100%) . It was diffuse brown intracytoplasmic stain with marked intensity in all the 10 cases (Table 22). (A.S.M.A) was negative in 5 cases of rhabdomyosarcomas (Figure 41).

Table (22) : The total immunohistochemacal study of (A.S.M.A) in 15 cases of rhabdomyosarcomas and leiomyosarcoams:

Histopathological diagnosis	No. of cases	Reaction to A.S.M.A.	
		Positive reaction	Negative reaction
• Leiomyosarcoma :	- 10 -		
Well differentiated	1	(+ + +)	
Well differentiated	1	(+ + +)	
Well differentiated	1	(+ + +)	
Well differentiated	1	(+ + +)	
Well differentiated	1	(+ + +)	
Poorly differentiated	1	(+ + +)	
Poorly differentiated	1	(+ + +)	
Poorly differentiated	1	(+ + +)	
Poorly differentiated	1	(+ + +)	
Poorly differentiated	1	(+ + +)	
* Rhabdomyosarcdomas :	- 5 -		
Embryonal	1		(- - -)
Embryonal	1		(- - -)
Embryonal	1		(- - -)
Alveolar	1		(- - -)
Alveolar	1		(- - -)
* Total	15	10	5

(+) , Mild staining ; (+ +) , Moderate staining ; (+ + +), Severe staining ; (- - -) No staining .

VI- The undifferentiated cases

The histopathological study :

Thirteen out of 50 cases were undifferentiated sarcomas (26%) of which 4 cases were from the reteroperitoneum , 3 from the lower extermities (thigh), 3 from the head / neck, 2 from the upper limb and one case was from the chest wall. All undifferentiated cases were numbered from one to 13 and classified according to their cell morphology into :

Undifferentiated round cell sarcomas:

They included cases number, one , 2 , 3 , 4 , 5 , 6 , 7 and 8 . In cases numbers (one ; 2 and 3), there was excessive proliferation of small cells, uniform in shape, rounded, with vesicular nuclei (Figure 42). The capillary blood vessels were obscured by increased number of tumor proliferative cells and appeared only in focal less cellular areas (Figure 45) specially in cases 2 and 3. In the 3rd. cases, the tumor cells had no particular arrangement. Few mitotic figures were seen in the 3 cases which were more prominent in cases 2 and 3 . Few large round cells with granular cytoplasm could be seen in case number one. Areas of hemorrhage and necrosis were frequent in the 3 cases .

In the two cases (4 and 5) the tumor cells were closely packed. They varied in size, and shape oval to from round shaped cells . In both cases, the tumor cells were highly cellular. Fascicular pattern could be observed in few regions in case number five . Fine collagen bundles separated the tumor cells, and numerous mitotic figures could be seen in case (5) (Figure 46) . Focal areas of necrosis and hemorrhage were shown in both cases.

Cases (6 ; 7 and 8), revealed , round cells (crowded) arranged haphazardly without any particular orientation except , case (8) in which the tumor cells shows focal areas with fascicular growth pattern and great number of scattered giant cells (Figure 43) . Typical and atypical mitotic figures were frequent in all cases. Plentiful large giant cells with multiple hyperchromatic irregular nuclei were shown . Delicate collagen fibrils encircling individual cells (Figure 47) , few myxoid area and chronic inflammatory cells could be seen in all cases. Areas of hemorrhage and necrosis could be seen . In case number (8) the blood vessels were dilated and apposition of the tumor cells to their walls simulate the pattern of haemangio-pericytoma .

The histochemical stains : (Table 23)

Recticulin stain revealed clearly fibrillary reticulin around capillary vascular channles in cases one , 2 and 3 whereas , it showed fibers separating the neoplastic cells in cases 4 and 5 but in cases 6 , 7 and 8 the reticulin stain demonstrated fine reticulin fibers around the individual cells and giant cells (Figure 44).

P.A.S. stain demonstrated capillary basement membrane in all cells but it is more marked in cases 2 and 3 (Figure 45).

Masson trichrome stain showed fine strands of collagen fibers between the tumor cells in cases 4 and 5 (Figure 46) . Delicate collagen fibers separating the tumor cells showed in cases 6 , 7 and 8 (Figure 47). No intracytoplasmic striation could be detected in all cases .

Alcian blue stain demonstrated little myxoid tissue in cases one ,2 and 3 . Few areas with myxoid degeneration were seen in cases 6 , 7 and 8 .

Undifferentiated spindle cell sarcomas :

They included cases number 9 , 10 and 11 and all showed greater number of oval or slightly elongated cells (near to be spindle shaped) with large hyperchromatic nuclei (slightly excenteric in postion) . Frequent multivacuolated giant cells with deep pink cytoplasm were seen. Few pleomorphic giant cells admixed with spindle cells and few inflammatory cells showed in one case. Necrosis , hemorrhage and mitotic figures were frequent in all cases (Figure 48) .

Histochemical stains : (Table 23)

Delicate reticulin network were seen between the cells by the reticulin stain. Few striation were demonstrated as parallel lines running along the length of cells on staining by trichrome stain . P.A.S. stain demonstrated intracytoplasmic glycogen (Figure 50) .

Undifferentiated mixed cells :

This included cases (12 and 13), which revealed round to spindle shaped cells that varied in size and shape with dark stained hyperchromatic nuclei and indistinct cytoplasm. The nuclei varied in size and shape. High rates of mitotic figures were shown. Scattered cells differed in size with granular material in its cytoplasm near the nucleus (Figure 49). Prominent cellular pleomorphism were remarkable in the two cases. Pyknotic and degenerated cells were frequent . Frequent multivacuolated cells were seen which also differed in size .

Histochemical stains : (Table 23)

Reticulin stain demonstrated reticulin fibers around neoplastic cells . P.A.S. stain showed the presence of intracellular glycogen deposits in the cytoplasm. Trichrome stain showed deeply stained (red) cytoplasm (Figure 51) .

Table(23):The histochemical stains in the(13)cases of undifferentiated sarcomas:

Serial numb. of cases	Histochemical stains			
	Rt.	M. Tri.	Alc. B	P.A.S
1	(+) A.B.V	(---)	(---)	(+) C.B.M.
2	(++) A.B.V	(---)	(+) M.	(++) C.B.M.
3	(++) A.B.V	(---)	(+) M.	(++) C.B.M.
4	(+) A.C.	(---)	(---)	(+) C.B.M.
5	(++) A.C	(++) B.C.	(---)	(+) C.B.M.
6	(++) A.C.	(+) B.C.	(+) M.	(+) C.B.M.
7	(++) A.C.	(+) B.C.	(+) M.	(+) C.B.M.
8	(++) A.C.	(+) B.C.	(+) M.	(+) C.B.M.
9	(++) A.C.	(+++) I.C.	(---)	(+++) I.C.
10	(+++) A.C.	(++) I.C.	(---)	(++) I.C.
11	(++) A.C.	(++) I.C.	(---)	(++) I.C.
12	(+) A.C.	(++) I.C.	(---)	(+++) I.C.
13	(+) A.C.	(++) I.C.	(---)	(++) I.C.

(+), Mild (not diagnostic) ; (++) Moderate (aid in diagnosis) ; (+++) Severe (diagnostic); (---) No staining

A.B.V. = Around blood vessels . M = Myxoid .

AC. = Around cells . C.B.M. = Capillary basement membrane .

I.C. = Intra cytoplasmic . B.C. = Between cells .

The stains = Rt = Reticulin M. Tri. = Masson trichrome

Alc. B. = Alcian blue P.A.S. =Periodic acid–Schiff stain .

The argyrophilic nucleolar organizer (AgNORs) in undifferentiated cases :

* The morphological picture of (AgNORs) study of the undifferentiated cases was similar to those seen in liposarcomas (Figure 52).
* AgNORs count / cell in all undifferentiated cases ranged between 8.50-9.70 (the mean = 9.35 ; SD ± 0.33) (Table 24).

Table (24) : The mean AgNORs count / cell in undifferentiated cases:

Serial Numb. of cases	Mean AgNORs count/cell	SD
1	9.60	-
2	9.50	-
3	9.50	-
4	9.50	-
5	8.90	-
6	9.20	-
7	9.50	-
8	9.40	-
9	9.70	-
10	8.50	-
11	9.20	-
12	9.50	-
13	9.50	-
Total	8.50-9.70 The mean 9.35	± 0.33

From the above results there is close correlation between the AgNORs count / cell in undifferentiated cases with AgNORs count / cell in classified high grade sarcomas .

The immunohistochemical study in undifferentiated cases :

The immunohistochemical studies of all undifferentiated cases were summarized in (Table 25) .

The tumor cells in all cases (13) revealed positive staining with antivimentin antibodies (100%) . Three cases (3/13) number (6 ; 7 and 8) were positive for alpha-1- antitrypsin (23%) . The five cases (5/13) number (9 ; 10 ; 11 ; 12 and 13) showed positivity for antidesmin antibodies (38.5%) . All markers appeared as diffuse brown intracytoplasmic stain (Figure 56).

Table (25) : The total immunohistochmical study of different antibodies used in undifferentiated sarcomas:

Serial numb. of cases	Immunohistochmical reactions		
	Vimentin	Alpha-1-antitrypsin	Desmin
1	(++)	(---)	(---)
2	(++)	(---)	(---)
3	(++)	(---)	(---)
4	(++)	(---)	(---)
5	(++)	(---)	(---)
6	(+++)	(+++)	(---)
7	(+++)	(+++)	(---)
8	(+++)	(+++)	(---)
9	(+++)	(---)	(+++)
10	(+++)	(---)	(+++)
11	(+++)	(---)	(+++)
12	(+++)	(---)	(+++)
13	(+++)	(---)	(+++)
Total positive cases(%)	13 (100 %)	3 (23 %)	5 (38.5 %)

(+) , Mild staining ; (+ +) , Moderate staining ; (+ + +), Severe staining ; (- - -) No staining .

From the above results the five cases number(one;2;3;4 and 5)(5/13)were negative for both anti-alpha-1- anti trypsin and anti-desmin (38.50%).

The immunohistochmical study in the 5 undifferentiated cases positive to desmin and vimentin by using (A.S.M.A):

The immunohistochmical study for (A.S.M.A) in cases positive to desmin and vimentin for undifferentiated cases were illustrated in (Table 26) .

The tumor cells in cases (9 ; 10 and 11) (3/5) revealed positive staining with (A.S.M.A.) (60%) . Which appeared as diffuse brown intracytoplasmic stain .

Table (26) : The total immunohistochemacal study of (A.S.M.A) in 5 undifferentiated cases positive to desmin and vimentin:

Serial Numb. Of cases	Reaction to A.S.M.A	
	Positive reaction	Negative reaction
9	(+ + +)	
10	(+ + +)	
11	(+ + +)	
12		(- - -)
13		(- - -)
Total	3	2

(+) , Mild staining ; (+ +) , Moderate staining ; (+ + +), Severe staining ; (- - -) No staining .

Cases number (12 and 13) were negative for A.S.M.A. (40%) .

Table (27) : The histochemical and immunohistochemical stains in classified and unclassified cases of S.T.S. :

Lesions	Total No. of cases	Subtypes	Histochemical stain				Immunohistochemical stains		
			Rt.	M.Tri.	Alc.B.	P.A.S.	Vi.	A.A.T	D.E.
I. Liposarcoma	- 7 -								
	2	* Myxoid	(+++) A.B.V.	(---)	(+++) M.	(+++) C.B.M	(+++)	(---)	(---)
	1	* Round cell	(++) A.B.V.	(---)	(+) M	(++) C.B.M.	(++)	(---)	(---)
	1	*Well differentiated: Sclerotic	(+) A.B.V.	(+++) B.C.	(---)	(+) C.B.M.	(+++)	(---)	(---)
	1	Intlammaroty	(+) A.B.V.	(---)	(+) M	(+) C.B.M.	(+++)	(---)	(---)
	2	* Pleomorphic	(+++) A.B.V.	(---)	(---)	(+++) C.B.M.	(++)	(---)	(---)
II. Fibrosarcoma	-8-								
	3	*Well differentiated	(++) A.C.	(+++) B.C.	(---)	(++) C.B.M	(+++)	(---)	(---)
	2	*Moderat differentiated	(++) A.C.	(+++) B.C.	(---)	(++) C.B.M.	(+++)	(---)	(---)
	3	*Poorly differentiated	(++) A.C.	(++) B.C.	(---)	(++) C.B.M.	(++)	(---)	(---)
III- M.F.H.	- 7 -								
	5	*Stroriform pleomorphic	(++) A.C.	(++) B.C.	(---)	(++) C.B.M.	(+++)	(+++)	(---)
	2	* Myxoid	(+) A.C.	(---)	(+++) M	(++) C.B.M.	(+++)	(+++)	(---)
IV- Leiomoysarcoma	-10-								
	5	*Well differentiated	(+++) A.C.	(+++) I.C.	(+) M.	(+++) I.C.G.	(+++)	(---)	(+++)
	5	*Poorly differentiated	(+++) A.C.	(++) I.C.	(+) M.	(+++) I.C.G.	(+++)	(---)	(+++)
V-Rhabdomyo-sarcomas	-5-								
	3	* Embryonal	(+) A.C.	(+++) I.C.	(+) M.	(+++) I.C.G.	(+++)	(---)	(+++)
	2	* Alveolar	(++) A.C.	(+++) I.C.	(---)	(++) I.C.G.	(+++)	(---)	(+++)
VI- Undifferentiated cases	- 13 -								
	1	Case 1	(+) A.B.V.	(---)	(---)	(+) C.M.B.	(++)	(---)	(---)
	1	Case 2	(++) A.B.V	(---)	(+) M.	(++) C.B.M.	(++)	(---)	(---)
	1	Case 3	(++) A.B.V.	(---)	(+) M.	(++) C.B.M.	(++)	(---)	(---)
	1	Case 4	(+) A.C.	(---)	(---)	(+) C.B.M.	(++)	(---)	(---)
	1	Case 5	(++) A.C	(++) B.C.	(---)	(+) C.B.M.	(+++)	(+++)	(---)
	1	Case 6	(++) A.C.	(+) B.C.	(+) M.	(+) C.B.M.	(+++)	(+++)	(---)
	1	Case 7	(++) A.C.	(+) B.C.	(+) M.	(+) C.B.M.	(+++)	(+++)	(---)
	1	Case 8	(++) A.C.	(+) B.C.	(+) M.	(+) C.B.M.	(+++)	(---)	(+++)
	1	Case 9	(++) A.C.	(+++) I.C.	(---)	(+++) I.C.G.	(+++)	(---)	(+++)
	1	Case 10	(+++) A.C.	(++) I.C.	(---)	(++) I.C.G.	(+++)	(---)	(+++)
	1	Case 11	(++) A.C.	(++) I.C.	(---)	(++) I.C.G.	(+++)	(---)	(+++)
	1	Case 12	(+) A.C.	(++) I.C.	(---)	(+++) I.C.G.	(+++)	(---)	(+++)
	1	Case 13	(+) A.C.	(++) I.C.	(---)	(++) I.C.G.			

(+) , Mild (not diagnostic) ; (++) Moderate (aid in diagnosis) ; (+++) Sever (diagnostic); (- - -) No staining

A.B.V. = Around blood vessels . M = Myxoid .

I.C.G. = Intra cytoplasmic glycogen .

AC. = Around cells . C.B.M. = Capillary basement membrane .

I.C. = Intra cytoplasmic .

B.C. = Between cells .

• Histochemical stains :

Rt = Reticulin M. Tri. = Masson trichrom

Alc. B. = Alcian blue P.A.S. =Periodic acid–Schiff stain .

* Immunohistochemical stains :

Vi = Vimentin De = Desmin

A.A.T. = Alpha-1- antitrypsin .

A.S.M.A. = Alpha- smooth muscle actin .

Immunohistochemical study of A.S.M.A. in all cases positive to desmin and vimentin :

Immunohistochemical studies for A.S.M.A. for all cases postive for desmin and vimentin were illustrated in (Table 28) :

All tumor cells in leiomyosarcomas and three cases (9;10 and 11) in undifferentiated cases were positive only for A.S.M.A. (13/20) (65%) .

Table (28) : The total immunohistochemacal study of (A.S.M.A) in total classified and unclassified cases Positive for desmin and vemntin :

Serial Numb.	Diagnosis	No. of cases	Reaction to A.S.M.A.	
			Positive reaction	Negative reaction
	* Classified cases			
	* Leiomyosarcomas	10	(+++)	
	* Rhabdomyosarcomas	5		(---)
	* Unclassified cases			
-9-	* Undifferentiated sarcoma	1	(+++)	
-10-	* Undifferentiated sarcoma	1	(+++)	
-11-	* Undifferentiated sarcoma	1	(+++)	
-12-	* Undifferentiated sarcoma	1		(---)
-13-	* Undifferentiated sarcoma	1		(---)
	* Total	20 (100%)	13 (65%)	7 (35%)

(+) , Mild staining ; (+ +) , Moderate staining ; (+ + +), Severe staining ; (- - -) No staining .

All tumor cells in rhabdomyosarcoma cases and cases (12 and 13) in unclassified case were negative for antidesmin (7/20) (35%) .

The argyrophilic nucleolar organizer (AgNORs) study in classified and unclassified cases in S.T.S.s :

The mean AgNORs count / cell in all S.T.S.s were illustrated in (Table 29)

AgNORs count / cell in all cases studied ranged between 4.20-9.70 (the mean = 7.14 ; SD ± 2.15) .

Table (29) : The mean AgNORs count / cell in all classified and unclassified S.T.S cases :

Histoparthligical types and grade	No. of cases	Range of AgNORs count / cell	Mean AgNORs count / cell	SD
• Classified cases	(37)			
Low grade :	8	4.20-5.40	4.78	± 0.38
Intermediate grade	11	4.56-6.80	5.89	± 0.78
High grade :	18	5.45-9.70	8.52	± 1.17
* Unclassified cases	13	8.50-9.70	9.35	± 0.33
* Total	50	4.20-9.70	7.14	± 2.15

From above results there is significant correlation between increase AgNORs count / cell and the grade of sarcomas . The AgNORs count/cell increase with progression of the grade. The main AgNORs count / cell in unclassified cases were in close relation with high grade only (near identical count). There is no great variation between AgNORs count in low and

intermediate grade. There is marked variation between AgNORs count / cell in high grade than low grade sarcomas .

So the findings of immunohistochemical and histochmecial revealed that :

The immunohistochemical findings : (Table 27 & 28)

* From the above results all classified and unclassified cases were stained with vimentin (so all cases were sarcomas). The results showed also that vimentin was the only marker which stained liposarcoma, fibrosarcoma and cases (one , 2 , 3 , 4 and 5) from unclassified group .

- All cases of M.F.H. expressed alpha-1- antitrypsin and also cases, (6,7 and 8) for unclassified cases stained by the same marker beside vimentin .
- The cases of both leiomyosarcoma and rhabdomyosarcoma and cases (9,10,11and 12) for unclassified cases were positive for desmin beside also vimentin .
- The staining with alpha smooth muscle for group positive to desmin , the stain marked well the cases of leiomyosarcoma and cases (9,10 and 11) for unclassified cases

*** The histochcemical stains findings revealed that : (Table 27)**

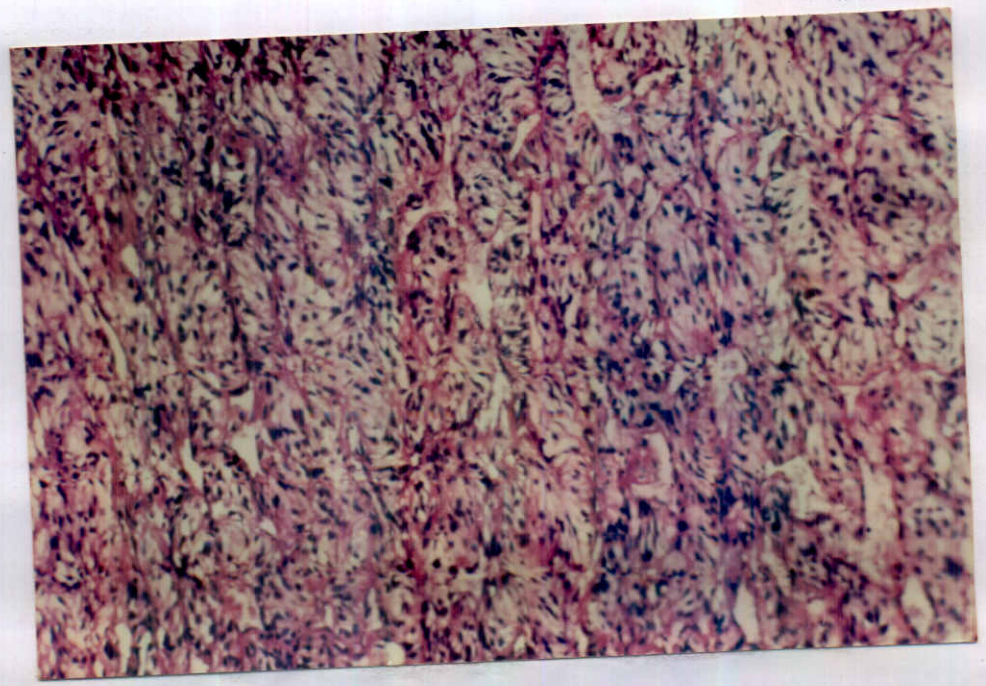
* Reticulin stain stained the reticulin fibers arround blood vesseles (in myxoid and round cell liposarcoma) and also stained reticulin fibers arround the neoplastic cell (in rest of all sarcomas cases) . So it was only significant in cases of liposarcoams) .

- Masson trichrome stain, stained collagen in matrix (in fibrosarcomas , and well differentiated sclerotic liposarcoams).It also stained of intracytoplasmic myofibrils (in both smooth muscle and skeletal muscle sarcomas) . So it was significant in cases of leiomyosarcoma and rhabdomyosarcoams .
- Alcian blue stain stained only myxoid matrix thus it was significant in all myxoid lesions only (myxoid liposarcaoms and myxoid M.F.H.)
- P.A.S. stain stained basement membrane of capillary blood vessels in general but is specific for vascular plexiform capillary lesion in myxoid liposarcoma and few in round cell liposarcoma and myxoid M.F.H. It also stained intracytoplasmic glycogen , it was diagnositic in leiomyosarcomas and rhabdomyosarcomas (muscle origin) .

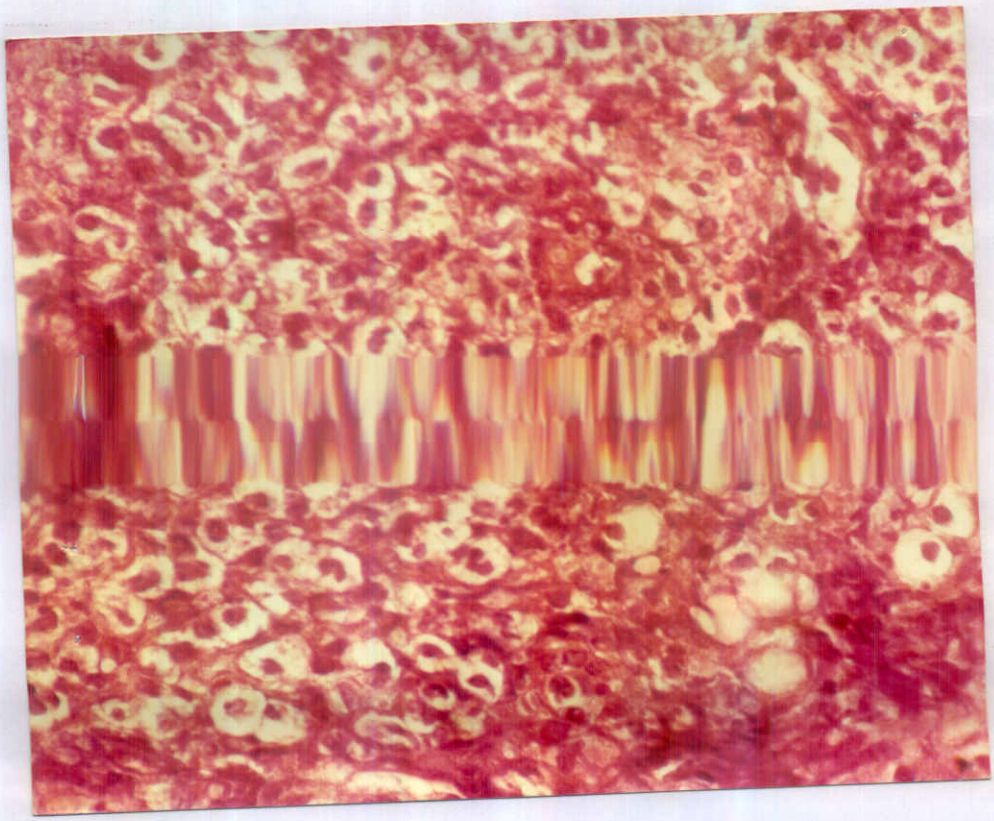
So in unclassified cases :

- The cases number 2 and 3 were positive for vimentin . They were well stained with reticulin (dense) and P.A.S. stain (dense) for demonstration of basement membrane of the blood capillaries. They simulate the cases of round liposarcomas in their reactions. So they may had lipoblastic origin .
- Cases number (5) also was marked with vimentin .It stained with reticulin (around the cells) and trichrome stain (collagen) . It was similar cases of poorly differentiated fibrosarcoma. So it is possibly of fibroblastic origin .

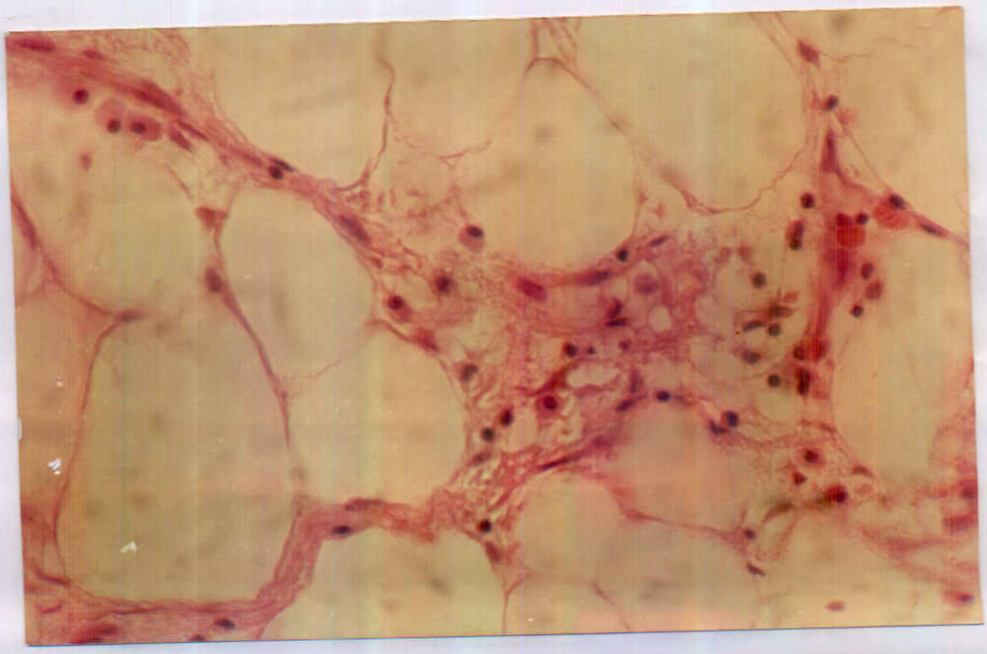
(Figure-1) : Case of control group (fatty tissue) showing one dark brown dots . Small round uniform in size and shap (AgNOR stain x 1000).



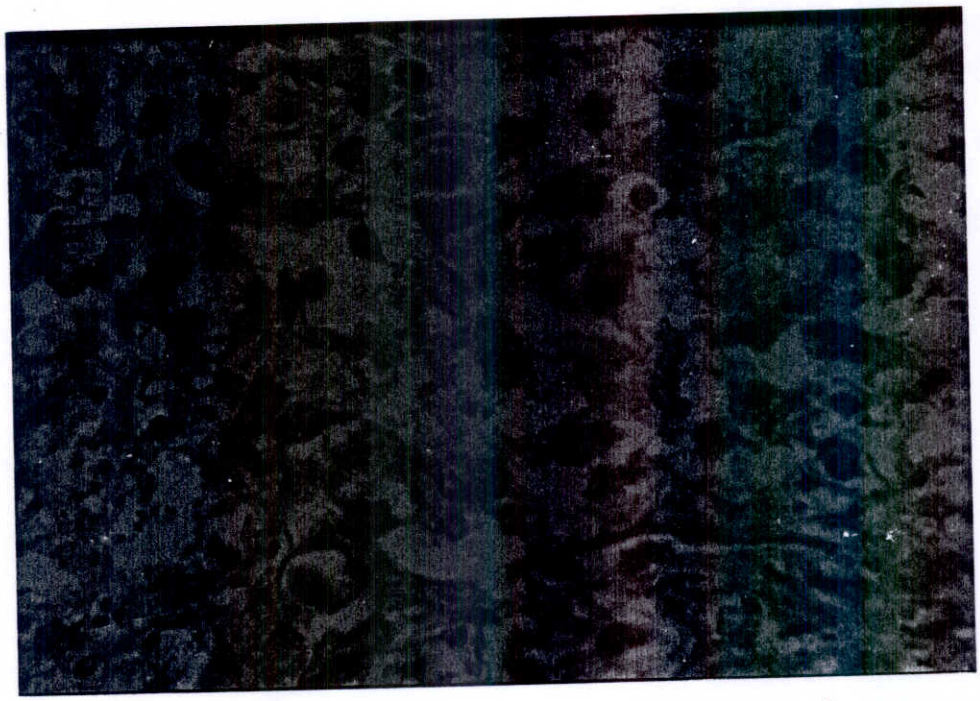
(Figure- 2) : Case of myxoid liposarcoma showing chicken wire arrangement of capillaries (PAS x 100) .



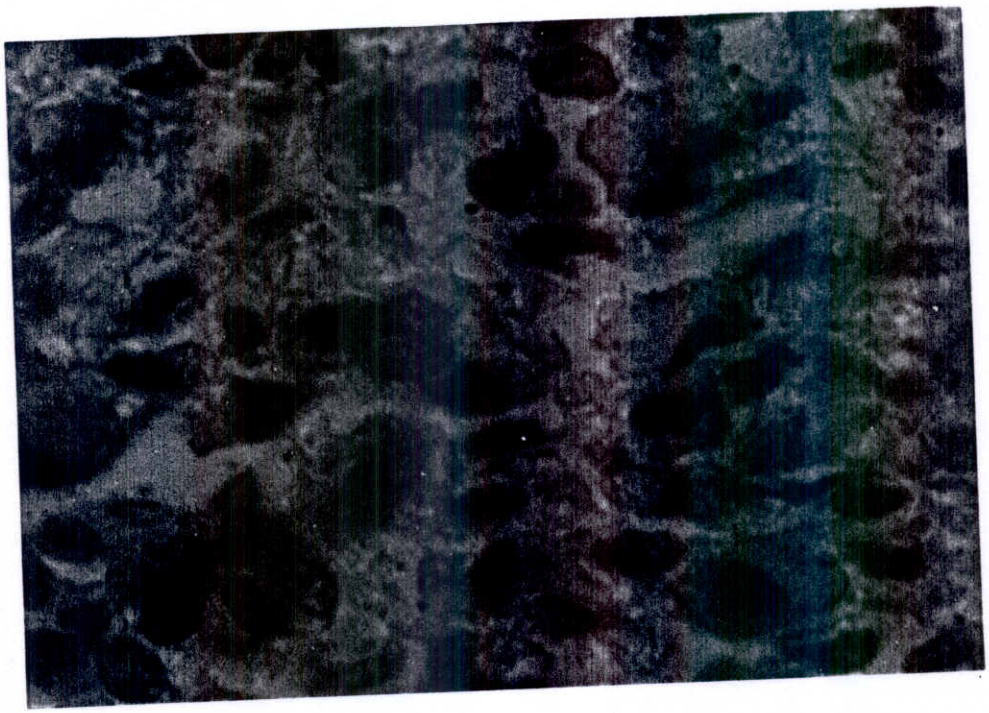
(Figure- 3) : Case of round cell liposarcoma showing small round cells with vesicular nuclei and some lipoblasts (H & E x 400).



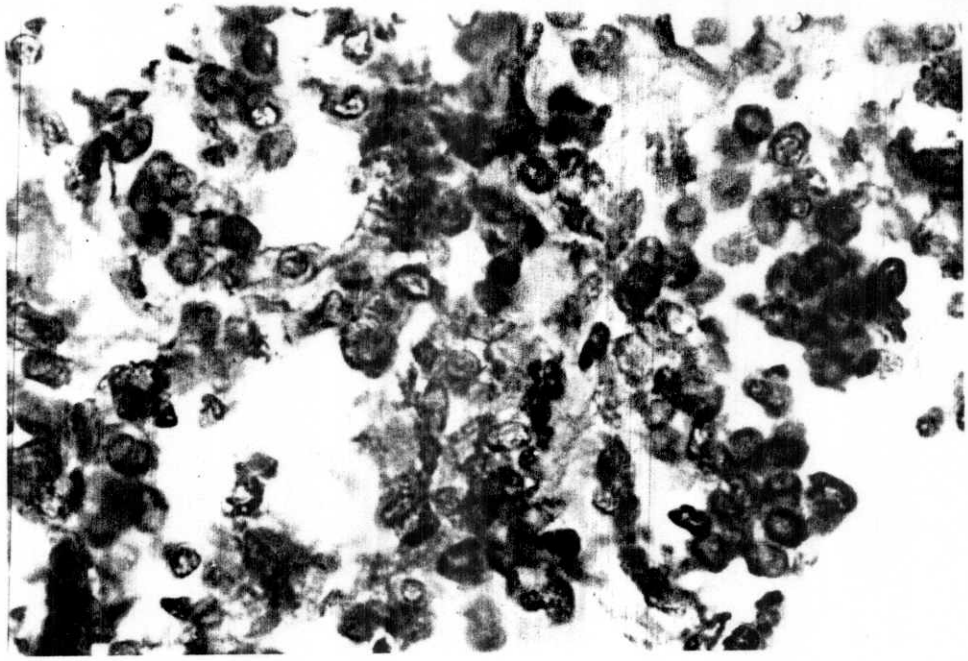
(Figure- 4) : Case of inflammatory liposarcoma showing infiltration of the tumor cell with the inflammatory cells mainly



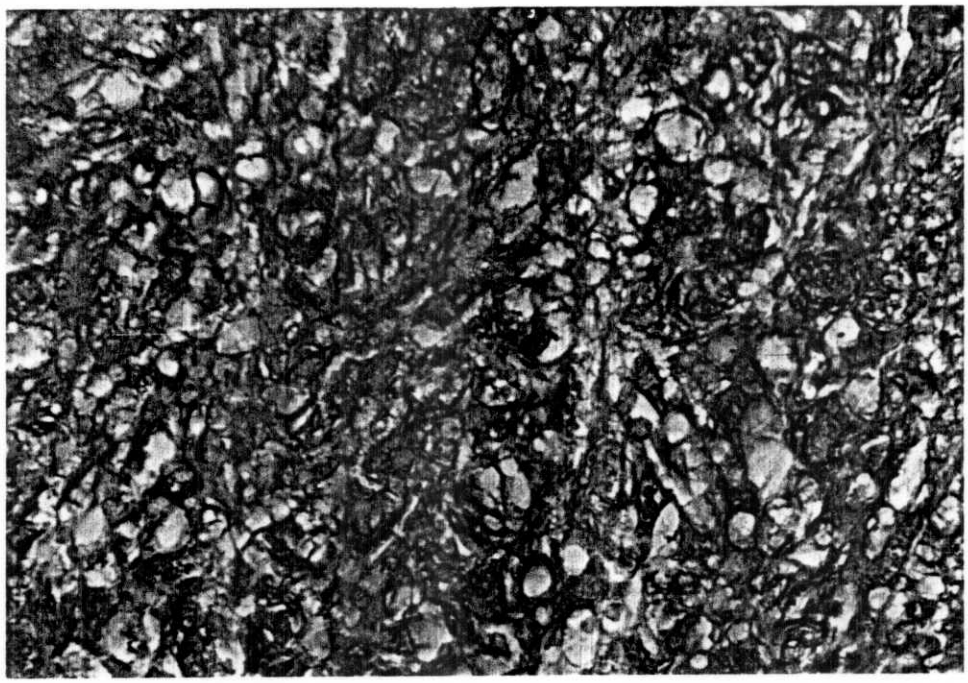
(Figure-55) : Desmin immunostian for undifferentiated mixed sarcoma showing diffuse cytoplasmic response for the positive cells (Desmin stain x 400)



(Figure-56) : Alpha smooth muscle actin immunostian for undifferentiated sarcoma showing diffuse cytoplasmic response for the labeled cells (A.S.M.A. stain x 1000).

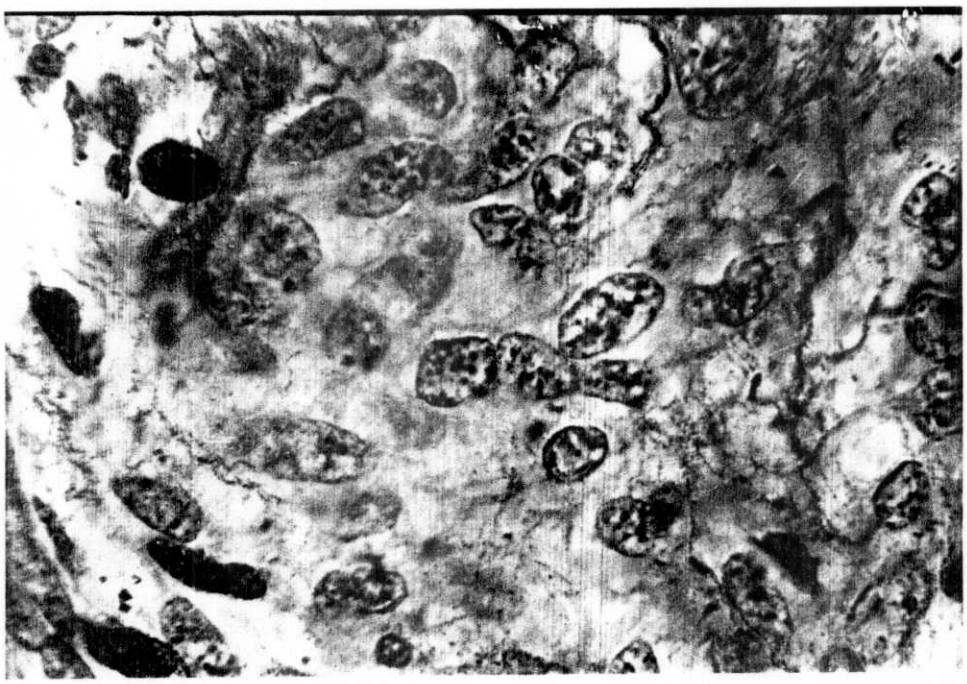


(Figure-53) : Vimentin immunostain of round cell undifferentiated sarcoma showing diffuse cytoplasmic staining for the positive cells . There is peri nuclear accentuation for the stain in positive cells (Vimentin stain x 1000).

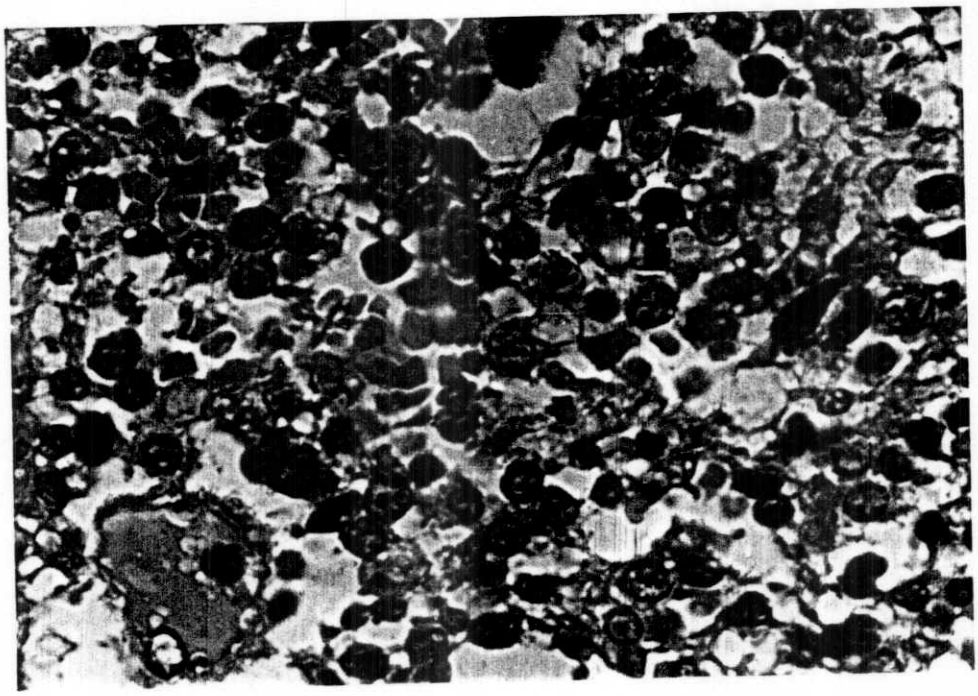


(Figure-54) : Alpha-1- antitrypsin immunostain of undifferentiated round cell sarcoma showing diffuse cytoplasmic response to labeled cells with perinuclear accentuation for the stain (Alpha-1- antitrypsin stain x 400).

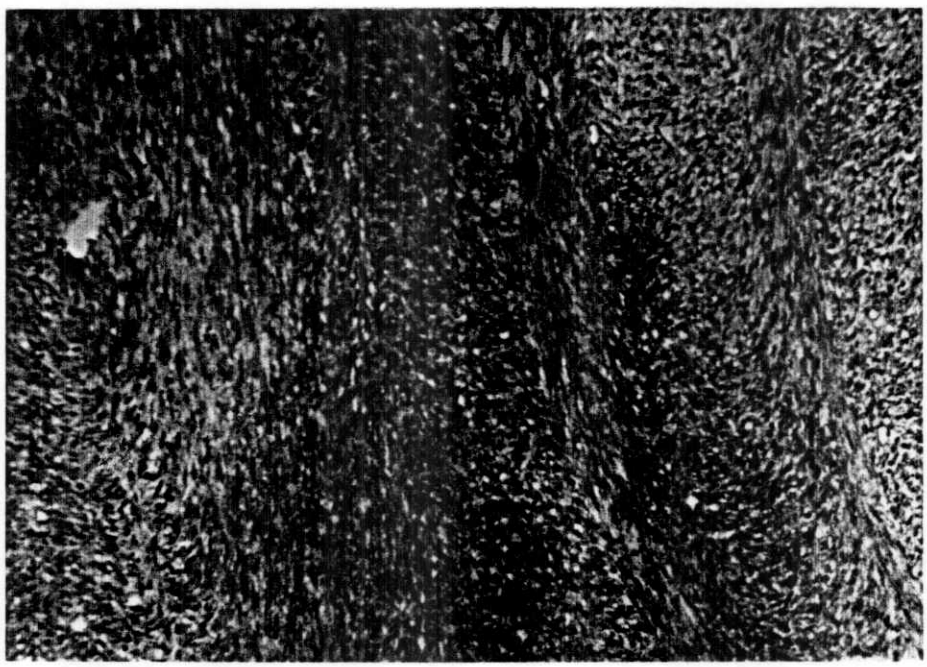
(Figure-51) : Case of undifferentiated mixed cell sarcoma showing red stained cytoplasm and collagen fibers (blue) separating the tumor cells (Masson trichrome x 1000).



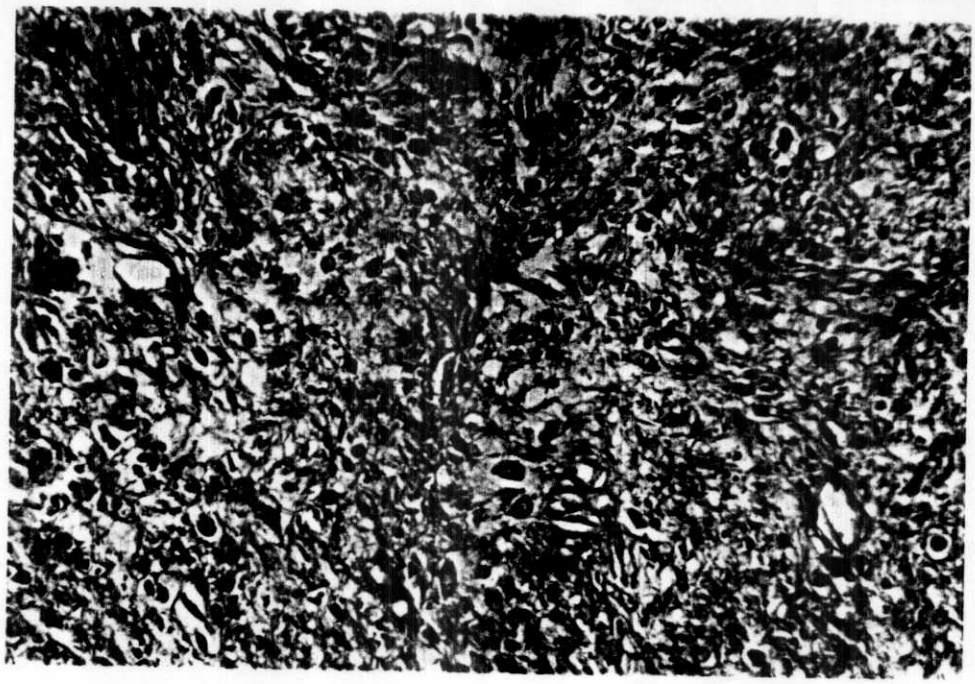
(Figure-52) : Case of high grade (undifferentiated) sarcoma showing small and large and irregular intranucleolar darck deposits arranged in clusters and some being arranged on the nuclear membrane (AgNOR stain x 1000).



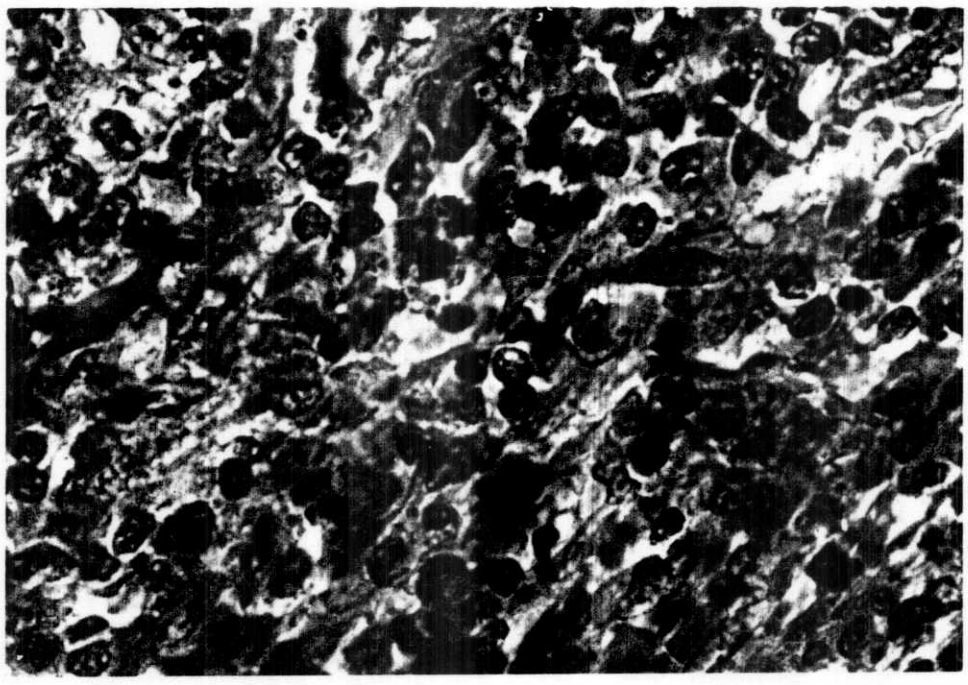
(Figure-49) : Case of undifferentiated mixed cell sarcoma showing tumor cells varied in size and shape with hyperchromatic nuclei and indistinct cytoplasm and Few mitotic figure showed (H & E stain x 400).



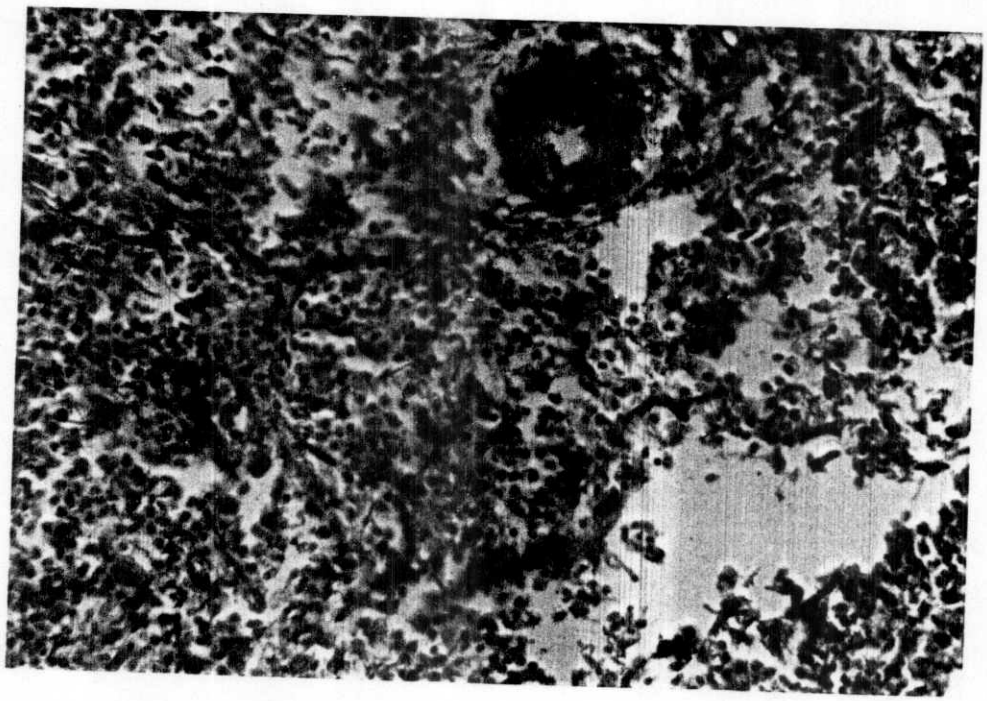
(Figure-50) : Case of undifferentiated sarcoma showing glycogen deposits through the cytoplasm (PAS stain x 100).



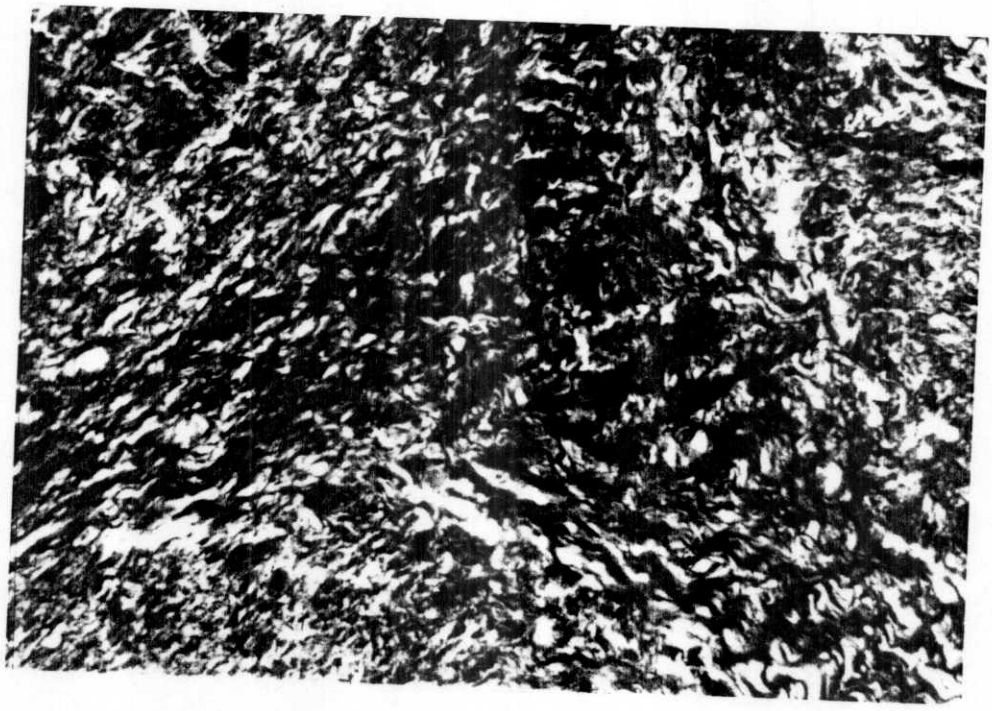
(Figure-47) : Case of undifferentiated round cell sarcoma showing delicate collagen fibers separating the tumor cells (Masson trichrome stain x 200).



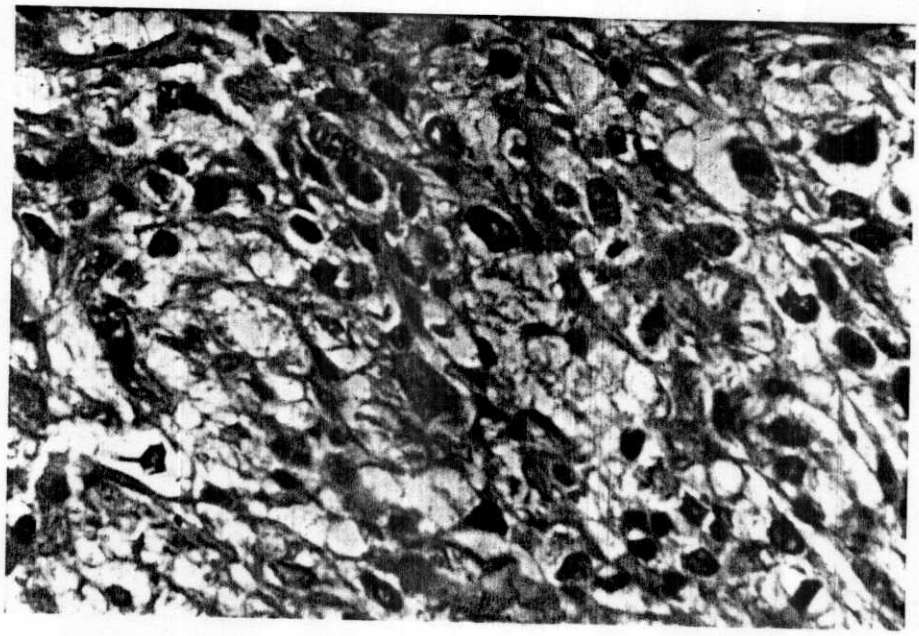
(Figure-48) : Case of undifferentiated spindle cell sarcoma showing oval or slightly elongated cells with hyperchromatic nuclei and abnormal mitosis (H & E stain x 1000) .



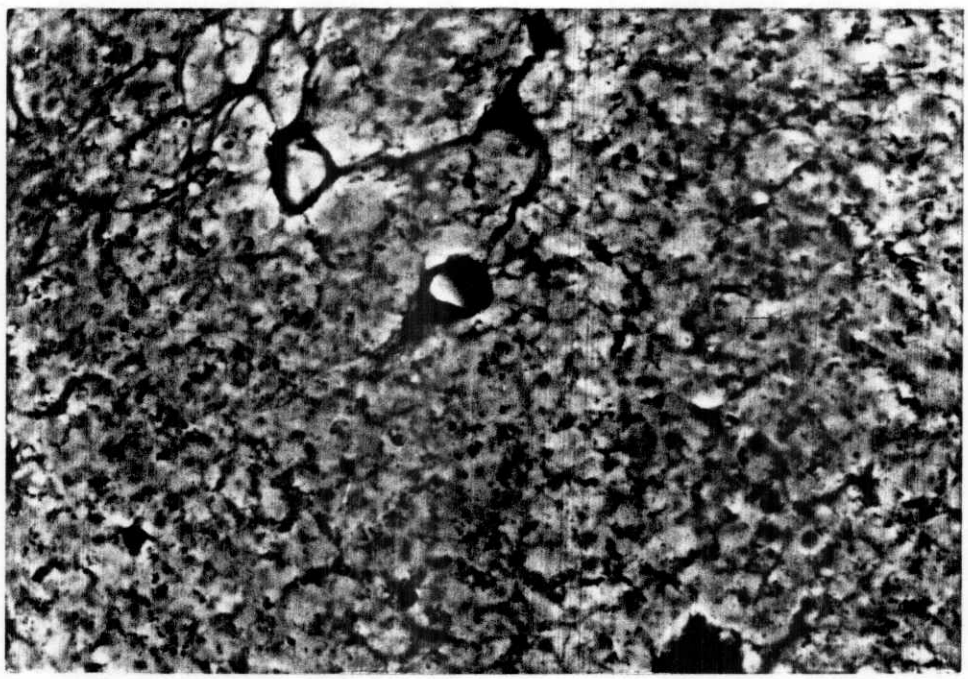
(Figure-45) : Case of undifferentiated round cell sarcoma showing the staining of capillary plexiform blood vessels which obscured by crowding of tumor cells (PAS stain x 200) .



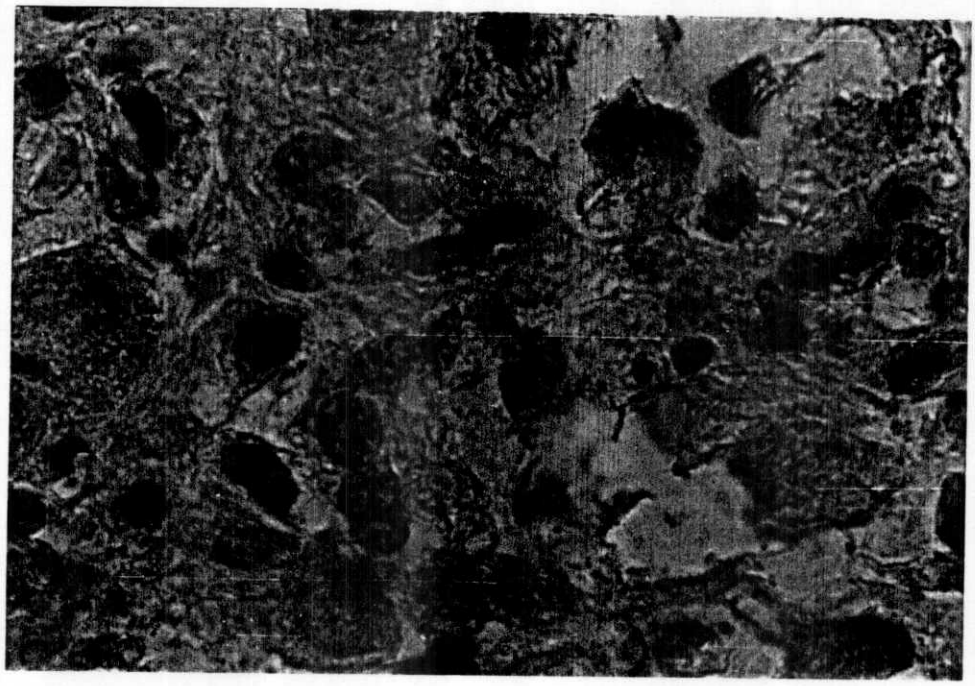
(Figure-46) : Case of undifferentiated round cell sarcoma showing fine collagen bundles between high cellular matrix (Masson trichrome stain x 400) .



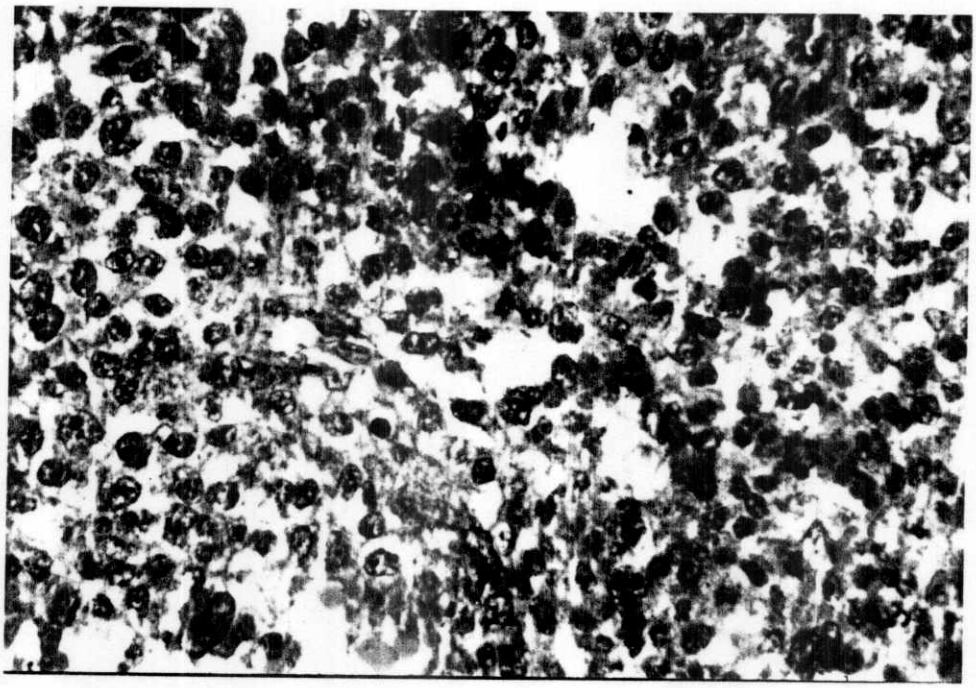
(Figure-43) : Case of undifferentiated round cell sarcoma showing the tumor cells arranged haphazardly (H & E stain x 400).



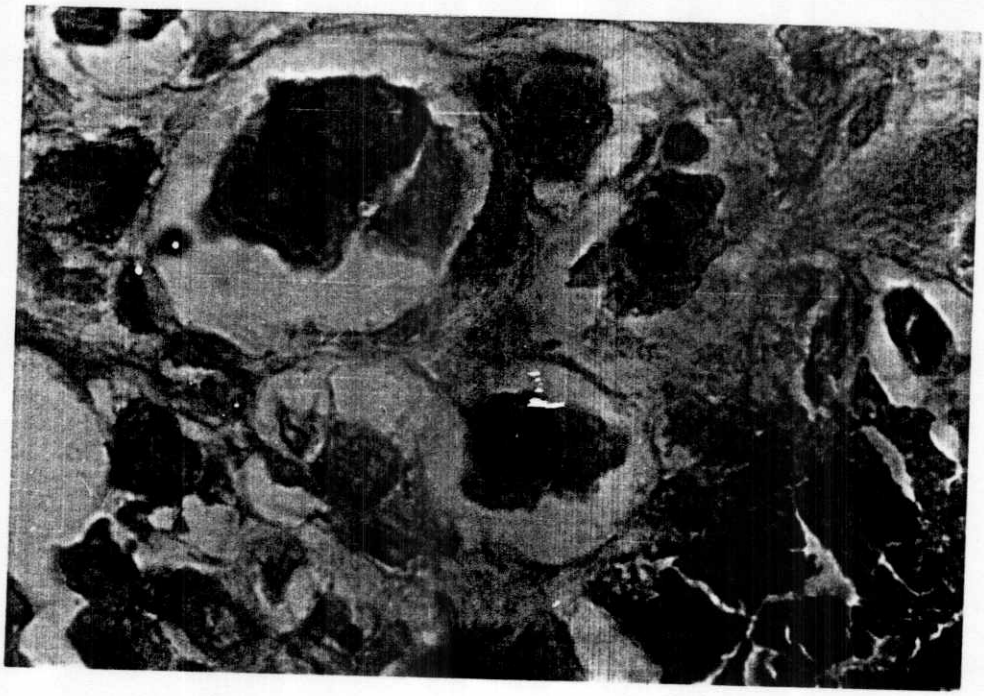
(Figure-44) : Case of undifferentiated round cell sarcoma showing reticulin fibrils around the capillary blood vessels (Reticulin stain x 400) .



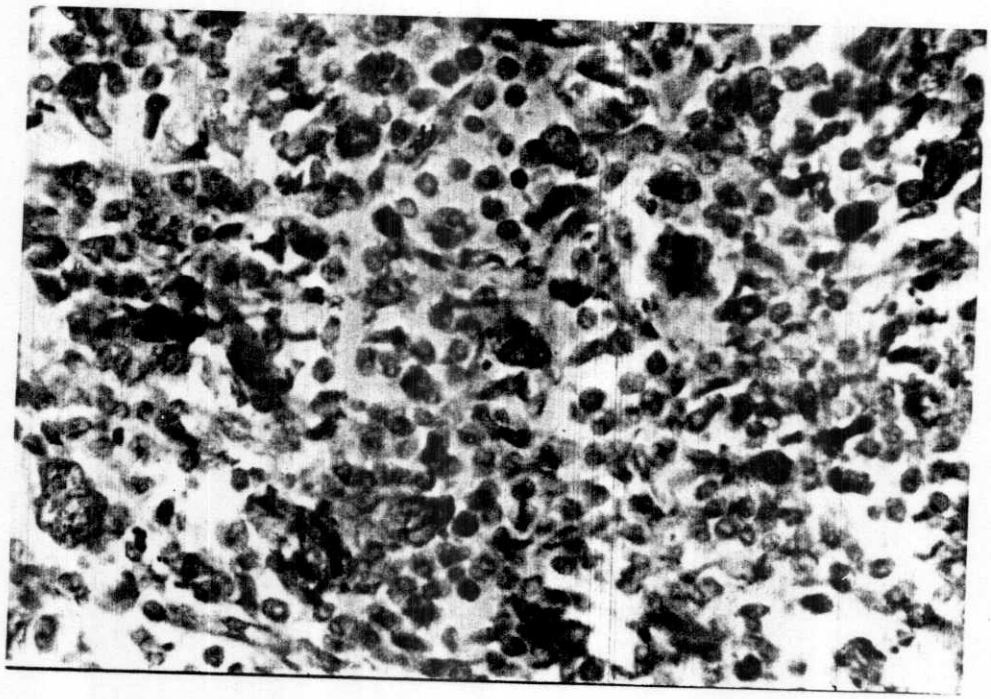
(Figure-41) : Alpha smooth muscle actin immunostain of poorly differentiated lieomyosarcoma showing diffuse cytoplasmic response to labeled cells . (alpha smooth muscle actin x 1000).



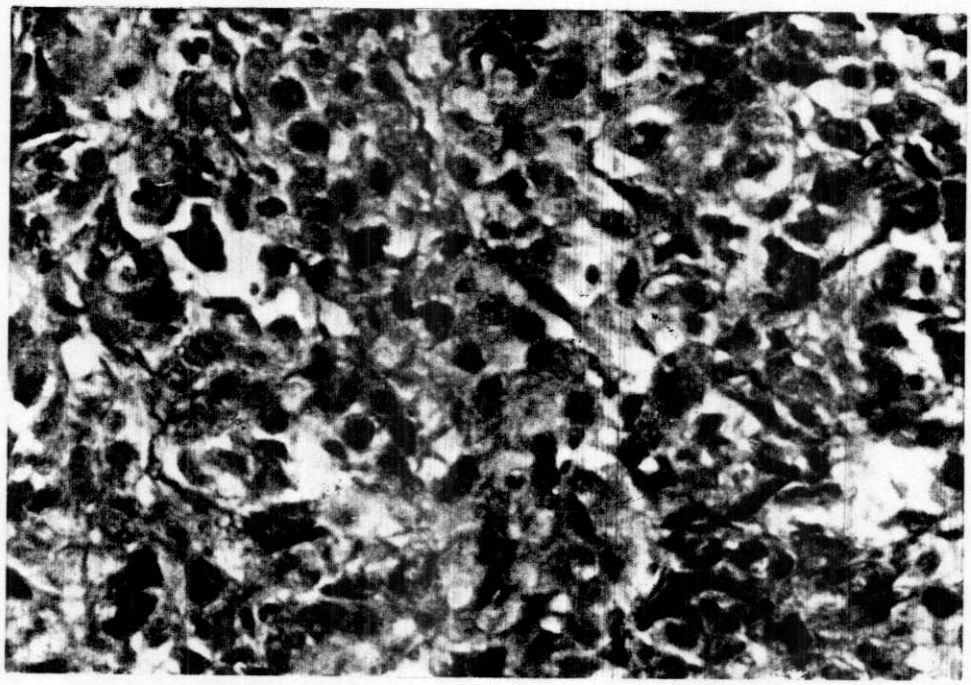
(Figure-42) : Case of undifferentiated round cell sarcoma showing proliferation of small cells uniformed in shape, round with vesicular nuclei (H & E x 400).



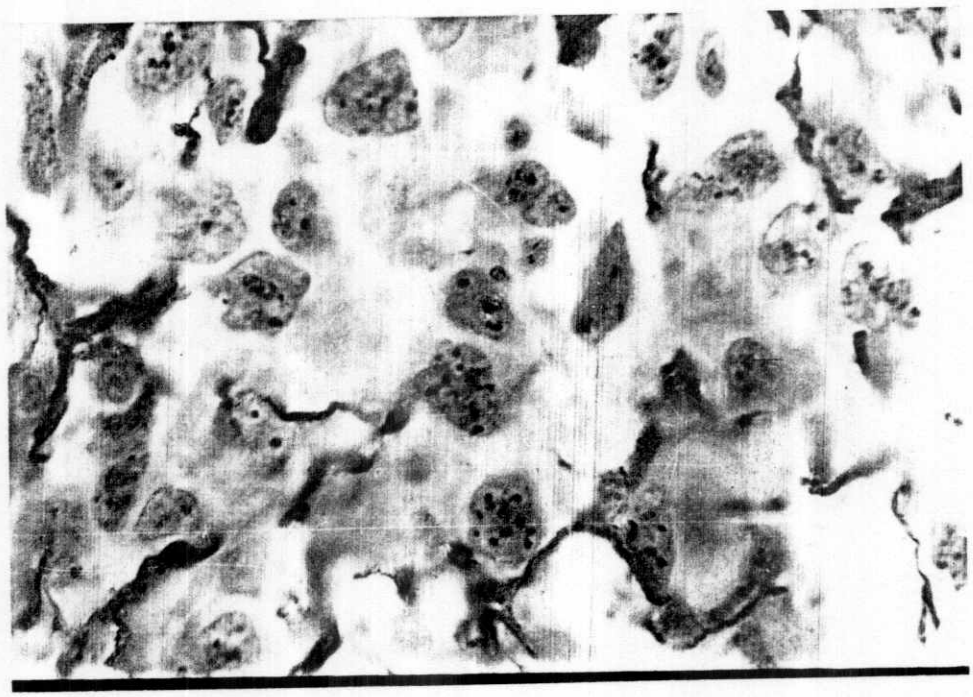
(Figure-39) : Desmin immunostain of embryonal rhabdomyosarcoma showing diffuse cytoplasmic response to labeled cells (Desmin x 1000) .



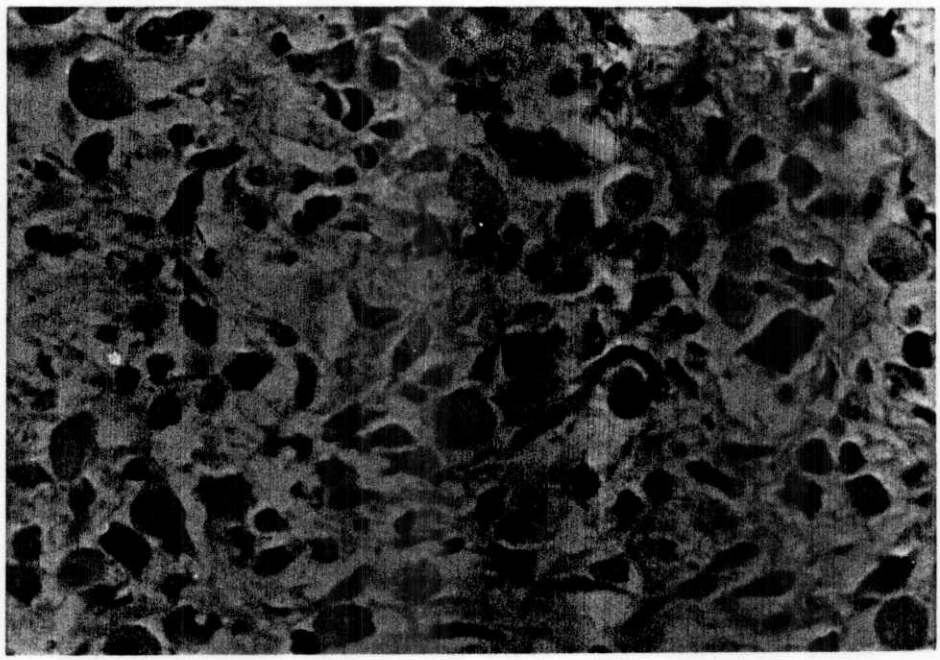
(Figure-40) : Vimentin immunostain of embryonal rhabdomyosarcoma showing diffuse cytoplasmic response to labeled cells . There is peri nuclear accentuation in labeled cells (Vimentin x 400).



(Figure-37) : Case of embryonal rhabdomyosarcoma showing collagen (blue) between neoplastic cells and myofibrils within cytoplasm (red) (Masson trichrome x 400)

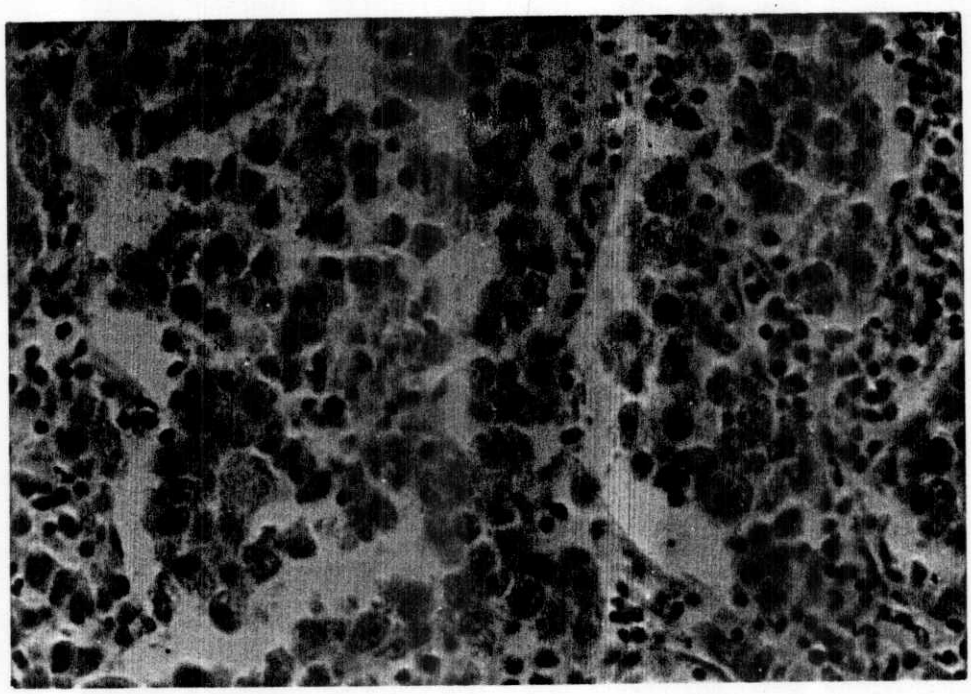


(Figure-38) : Case of high grade rhabdomyosarcoma showing intranucleolar black dots, increased in number , small and large and irregular arranged in clusters and dispersed in nucleoplasm (AgNOR stain x 1000).

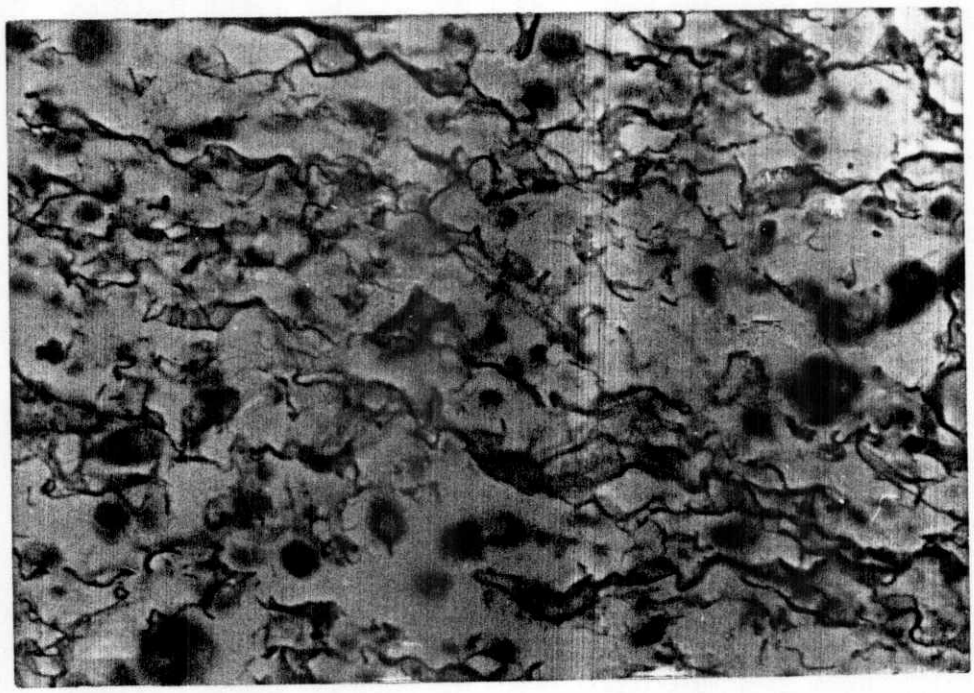


(Figure-35) : Case of embryonal rhabdomyosarcoma showing intracellular glycogen deposits (PAS x 400).

(Figure-36) : Case of embryonal rhabdomysoarcoma showing red myofibrils within the spindle shaped rhabdomyoblast (Masson trichrome x 400) .

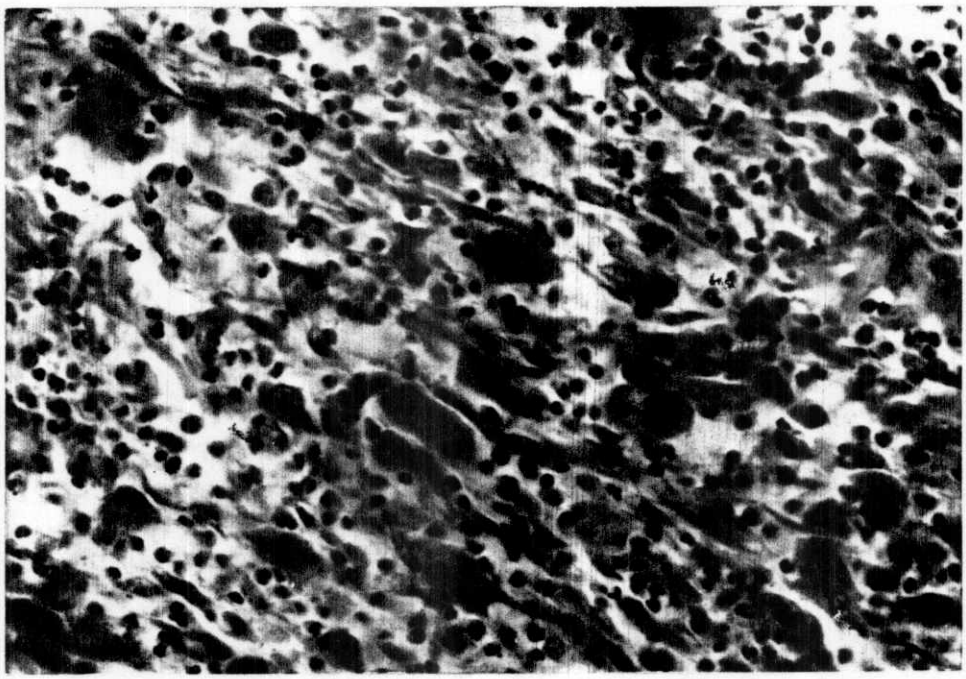


(Figure-33) : Case of Alveolar rhabdomyosarcoma showing ill defined groups and nests of small round cells within an alveolar like space . There exists variation of cells and nuclear size (H & E x 400).

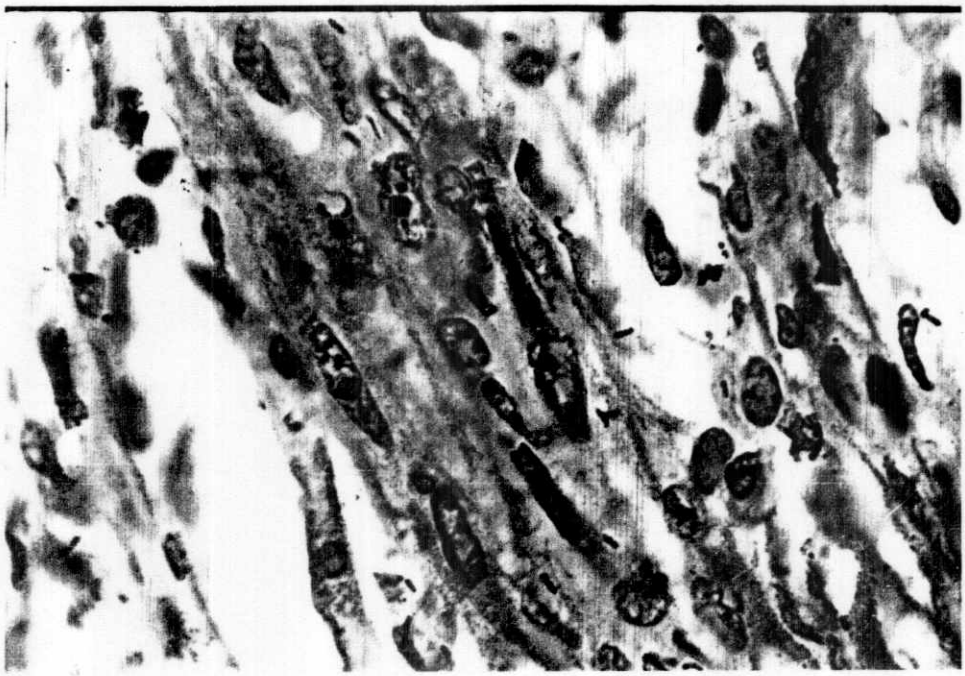


(Figure-34) : Case of embryonal rhabdomyosarcoma showing minimal amount of reticulin fibers around neoplastic cells (Reticulin x 400) .

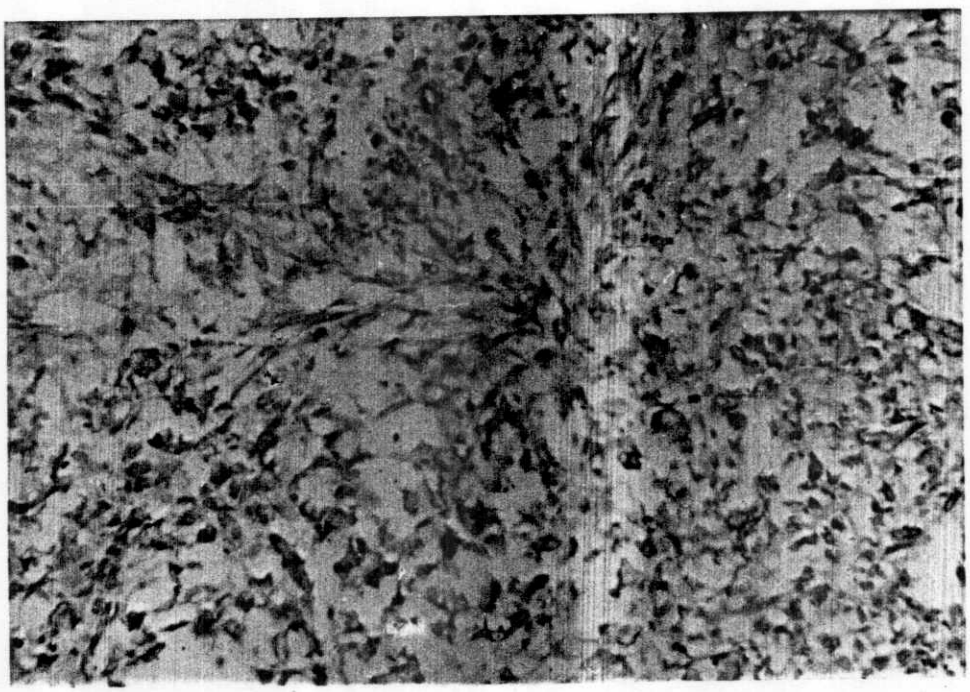
(Figure-31) : Desmin immunostain of well differentiated leiomyosracoma showing diffuse cytoplasmic response of labeled cells . Some labeled cells showing perinuclear accentuation for the stain (Desmin x 1000).



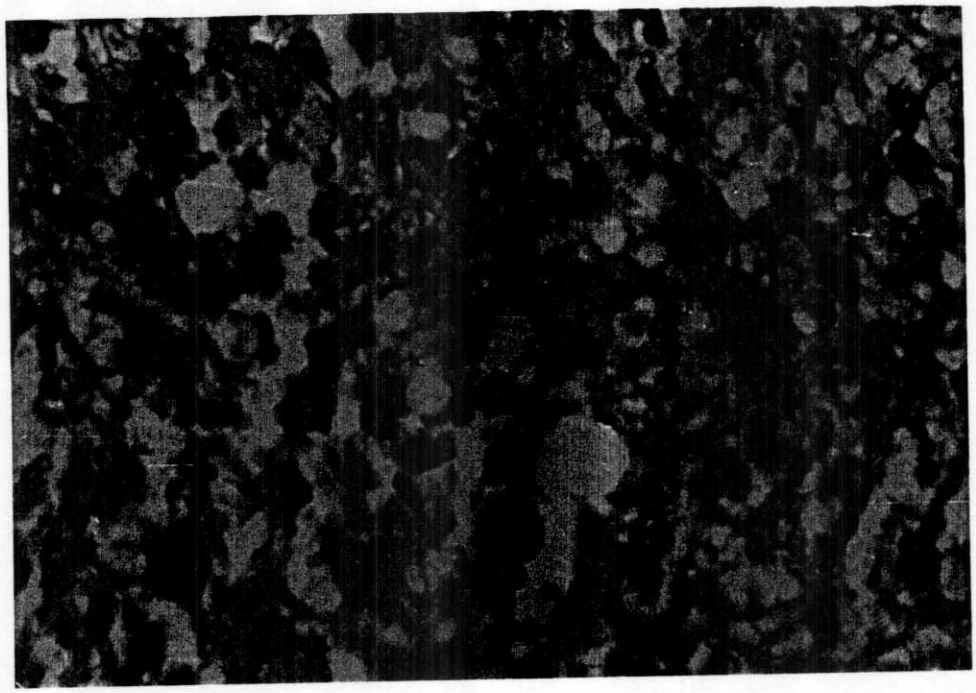
(Figure-32) : Case of embryonal rhabdomyosarcoma showing giant cells. Strap shaped and raquet shaped rhabdomayoblast (H & E x 400) .



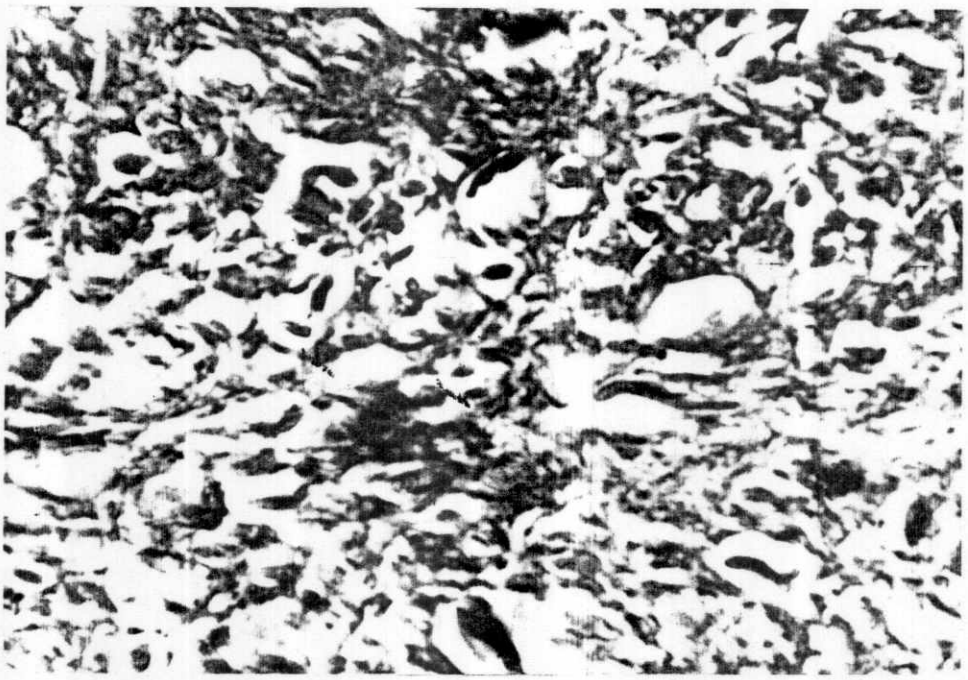
(Figure-29) : Case of intermediate grade of leiomaysarcoma showing intranucleolar dark dots , small and large and irregular . Some are arranged near nuclear membrane and some are dispersed in nucleoplasm and arranged in clusters (AgNOR stain x 1000).



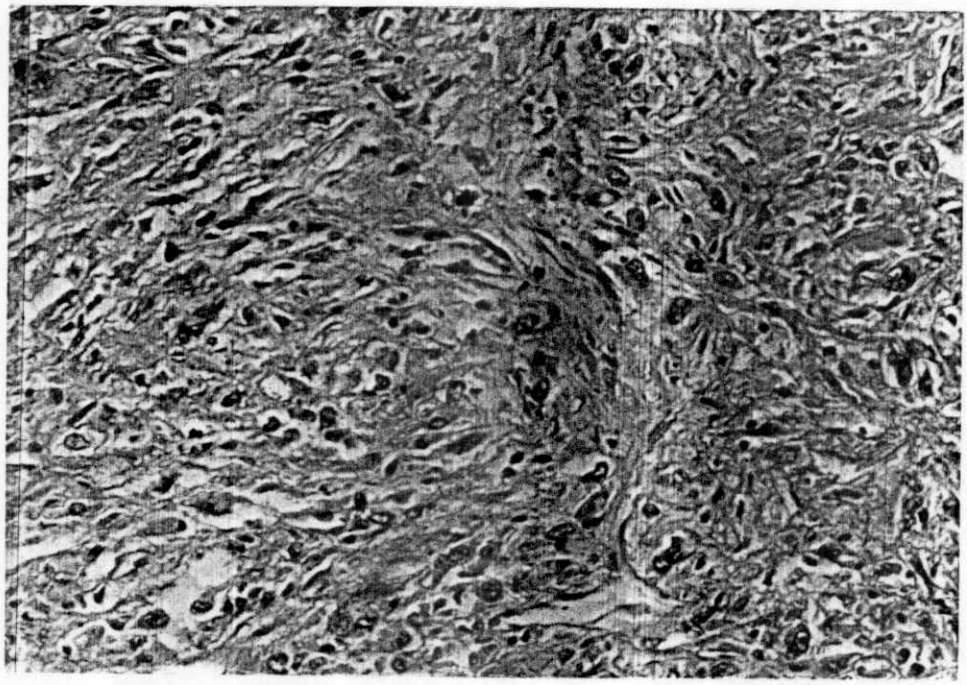
(Figure-30) : Vimentin immunostain of well differentiated leiomyosracoma showing diffuse cytoplasmic response of labeled cells (Vimentin x 200).



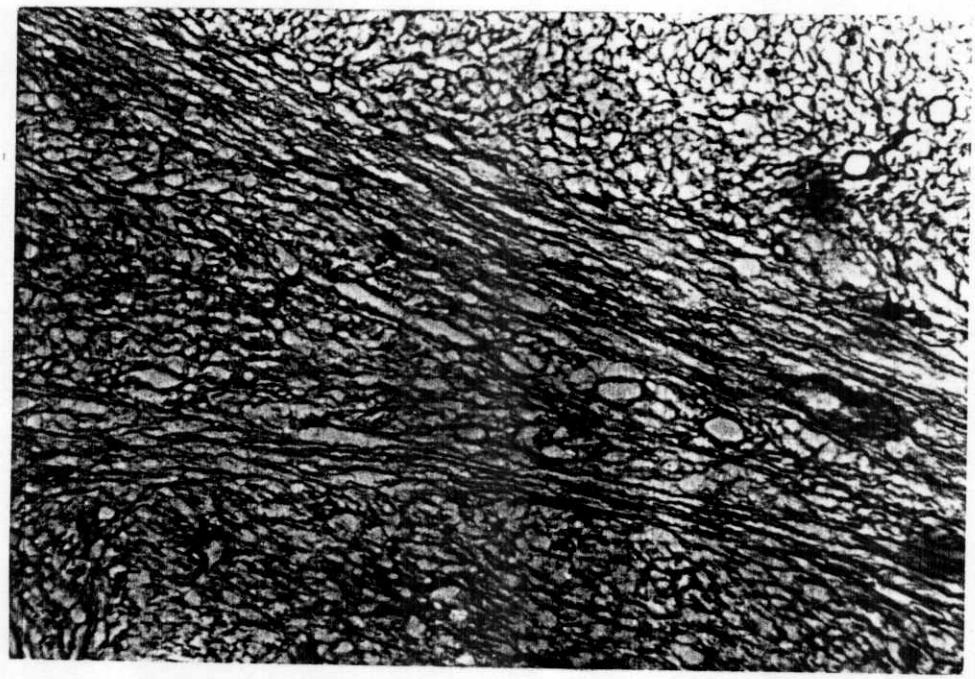
(Figure-27) : Case of well differentiated leiomayosarcoma showing intracytoplasmic glycogen deposits (PAS x 400).



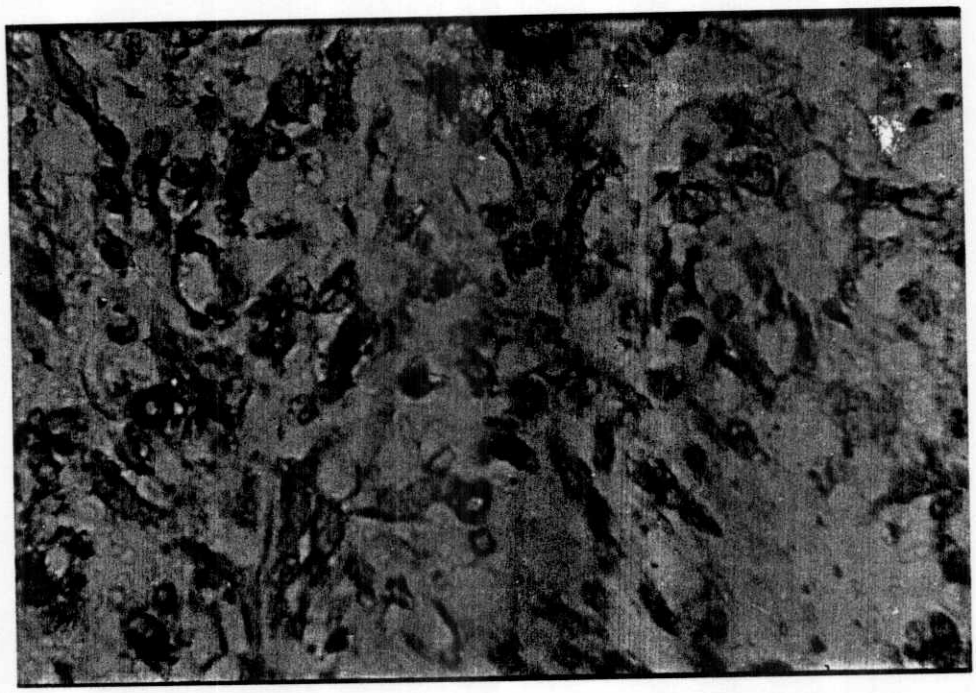
(Figure-28) : Case of poorly differentiated leiomaysoarcoma showing intracytoplasmic red stained myofibrils (Masson trichrome stain x 400) .



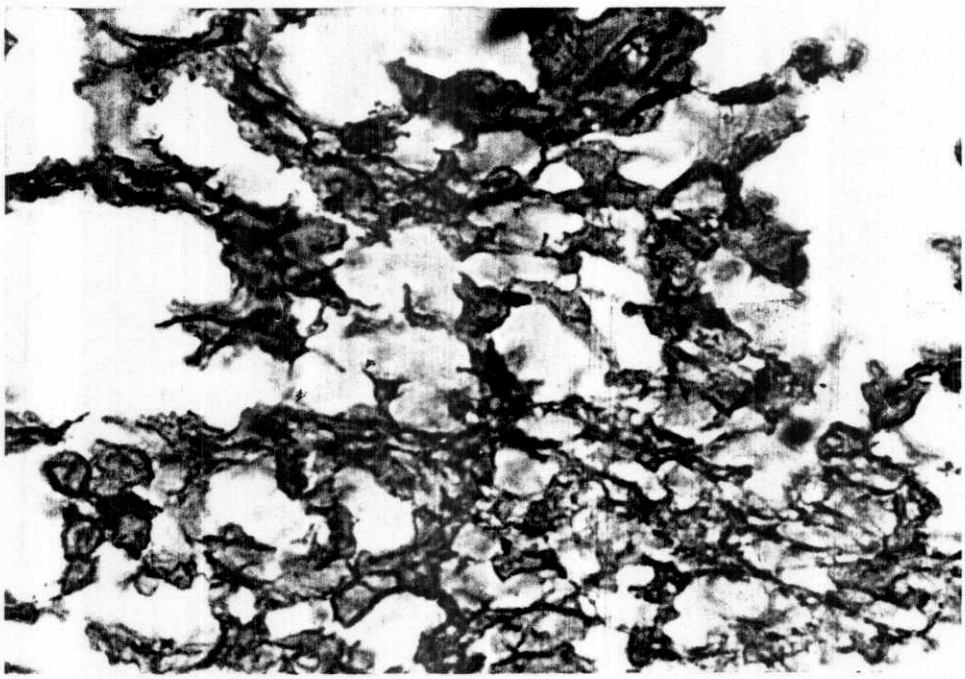
(Figure-25) : Case of poorly differentiated leiomayosarcoma showing epithelioid cells appear with its round shape appearance (H & E x 200).



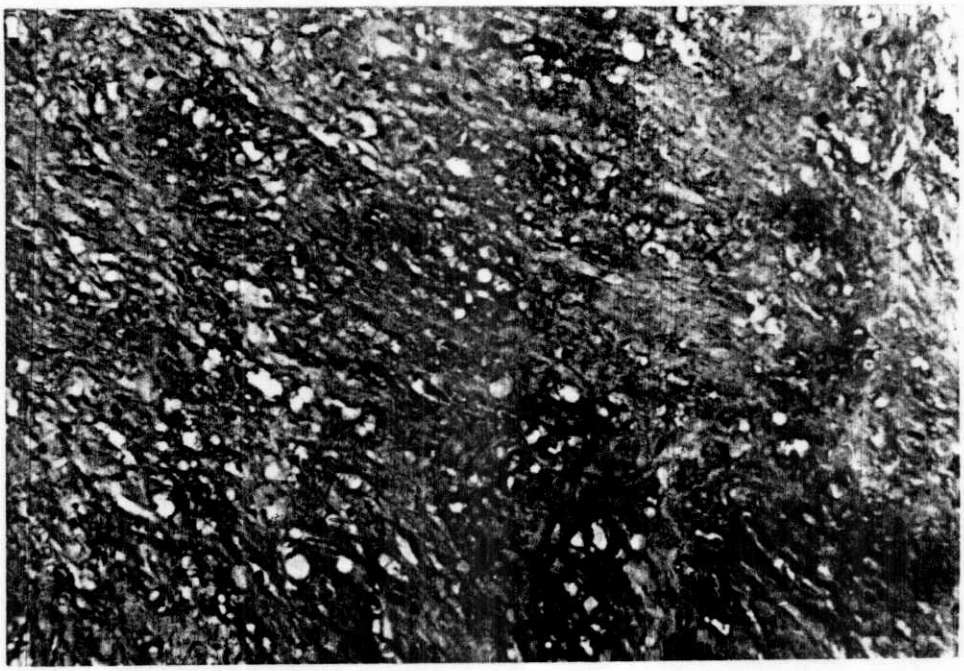
(Figure-26) : Case of well differentiated leiomayosarcoma showing reticulin fibers surrounding the individual tumor cells in fascicles and in groups (Reticulin x 200).



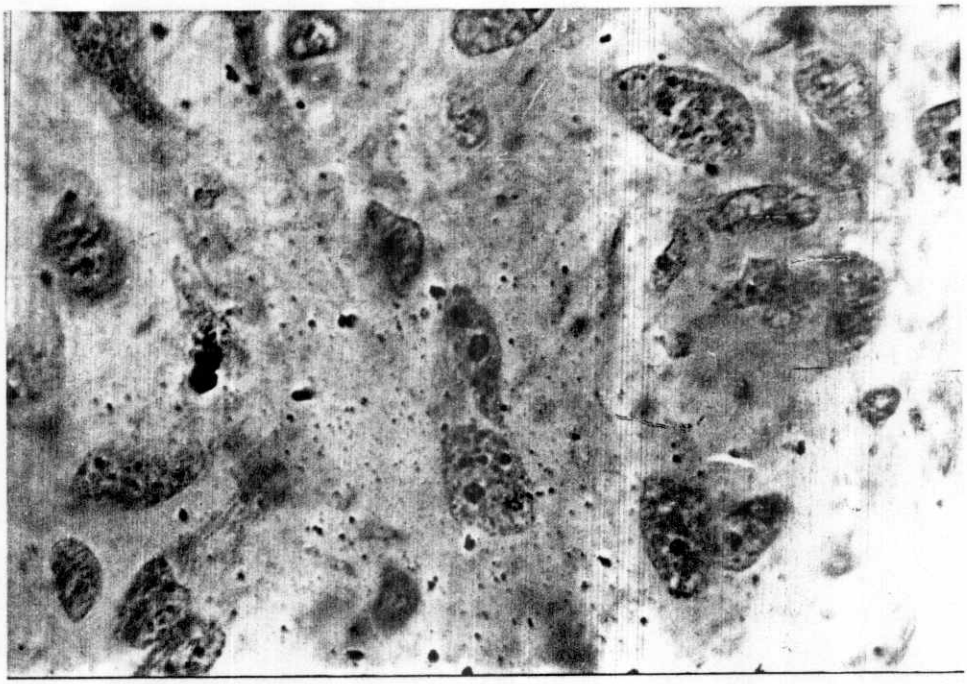
(Figure-23) : Vimentin immunostain of storiform pleomorphic M.F.H. showing diffuse cytoplasmic response of labeled cells. Some cells showing perinuclear accentuation for the stain (Vimentin x 400).



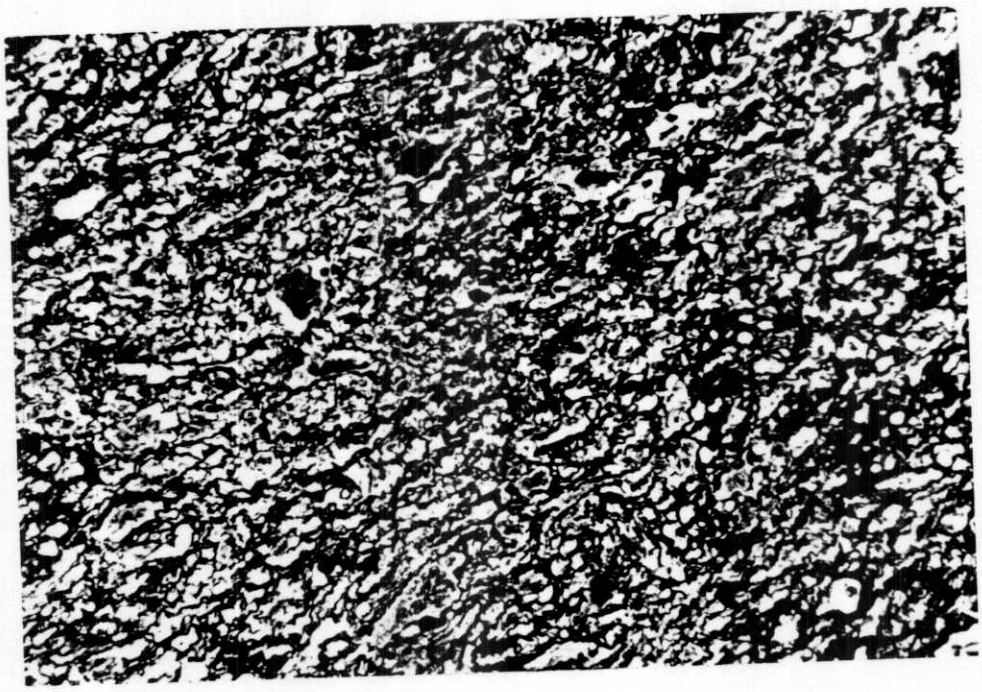
(Figure-24) : Alpha-1- antitrypsin immunostain of storifrom pleomorphic M.F.H. showing diffuse cytoplasmic response of labeled cells (Alpha-1- antitrypsin x 1000).



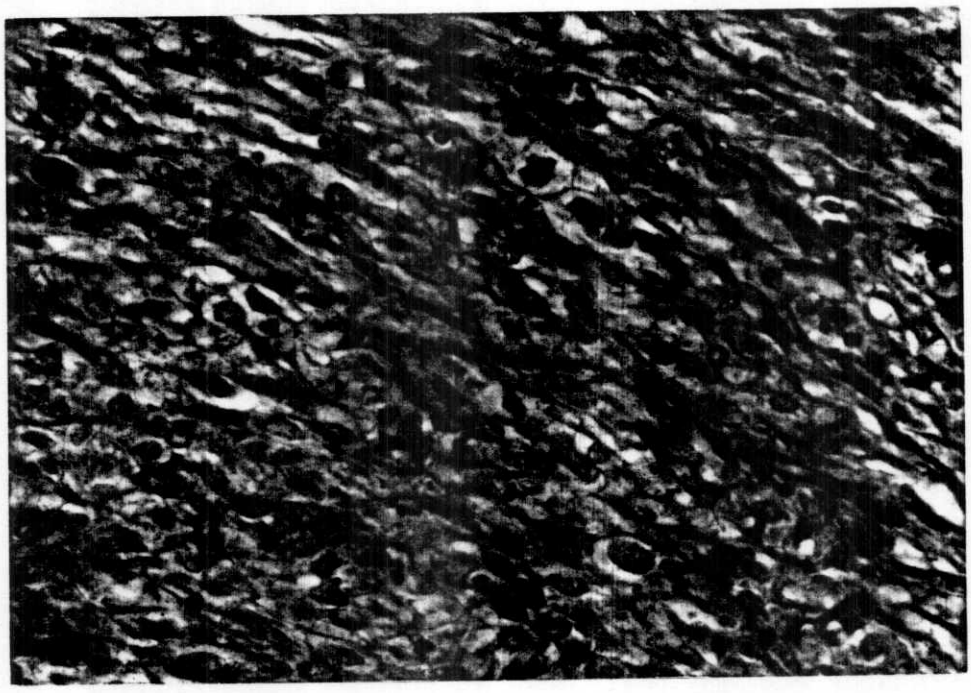
(Figure-21) : Case of myxoid M.F.H. showing myxoid area (Alcian blue stain x 200).



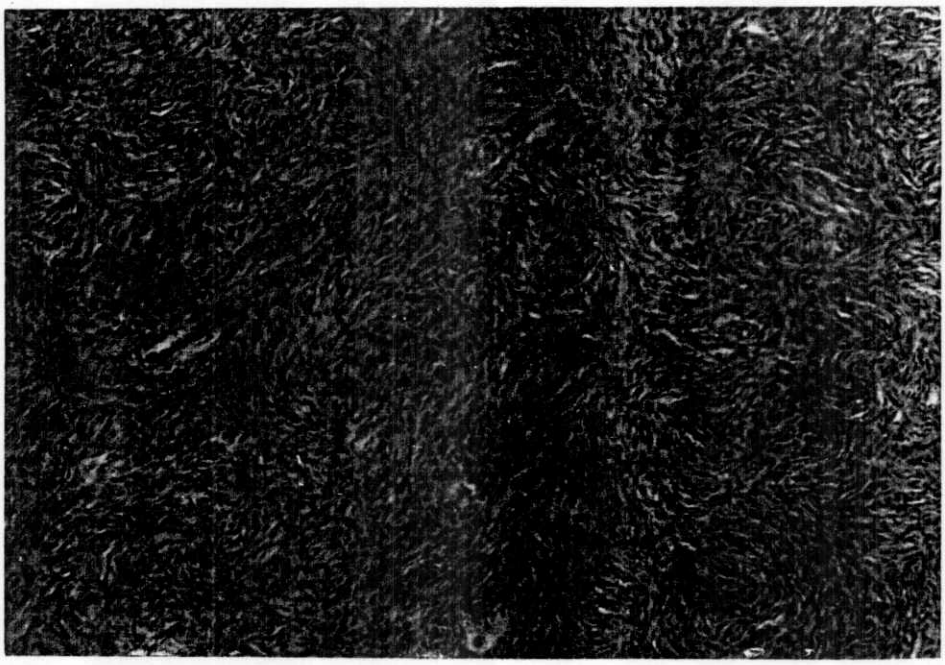
(Figure-22) : Case of intermediate grade of M.F.H. showing intranucleolar small and large and irregular black dots the majority of them arranged in clusters and some dispersed in nucleoplasm (AgNOR stain x 1000) .



(Figure-19) : Case of storiform pleomorphic M.F.H. showing reticulin fibers surrounding the individual cells and giant cells (Reticulin x 200).

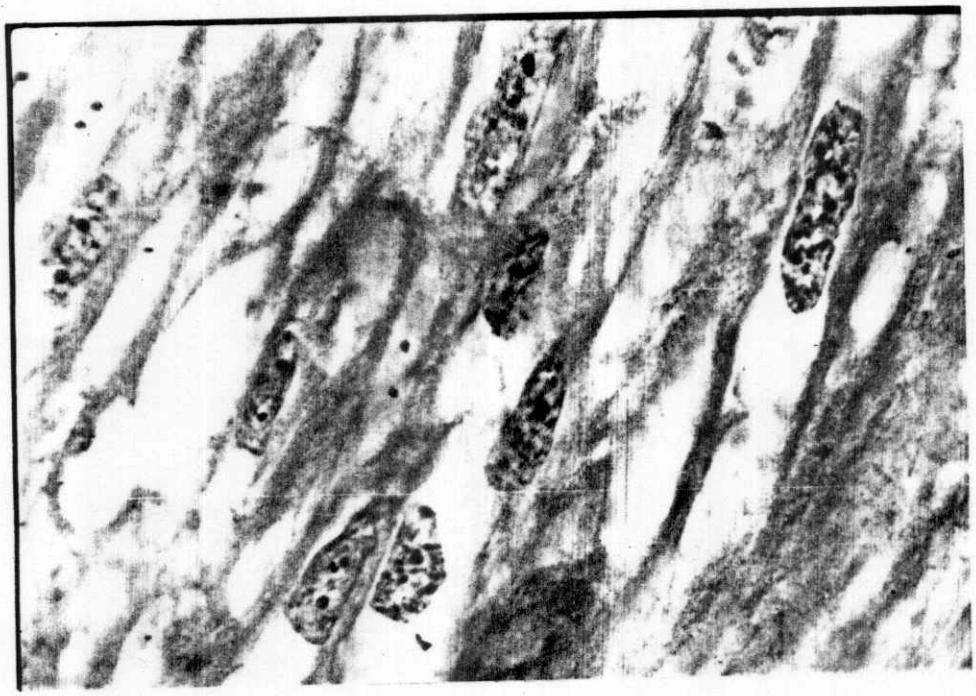


(Figure-20) : Case of storiform pleomorphic M.F.H. showing delicate collagen fibers separating the tumor cells (Masson trichrome x 200) .

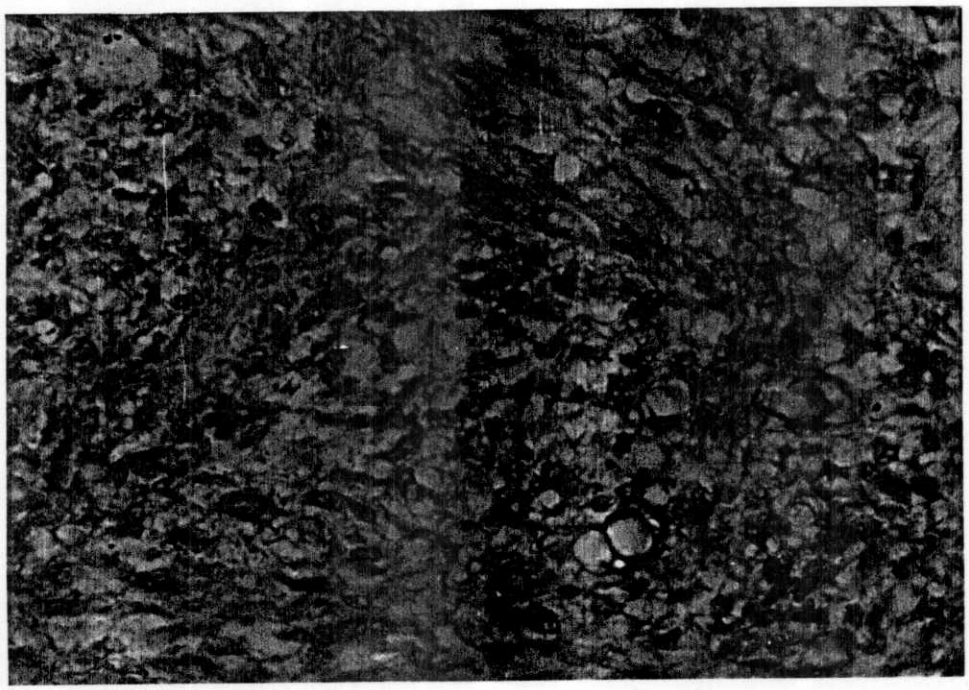


(Figure-17) : Case of M.F.H. showing a cart-weal pattern (H & E x 100).

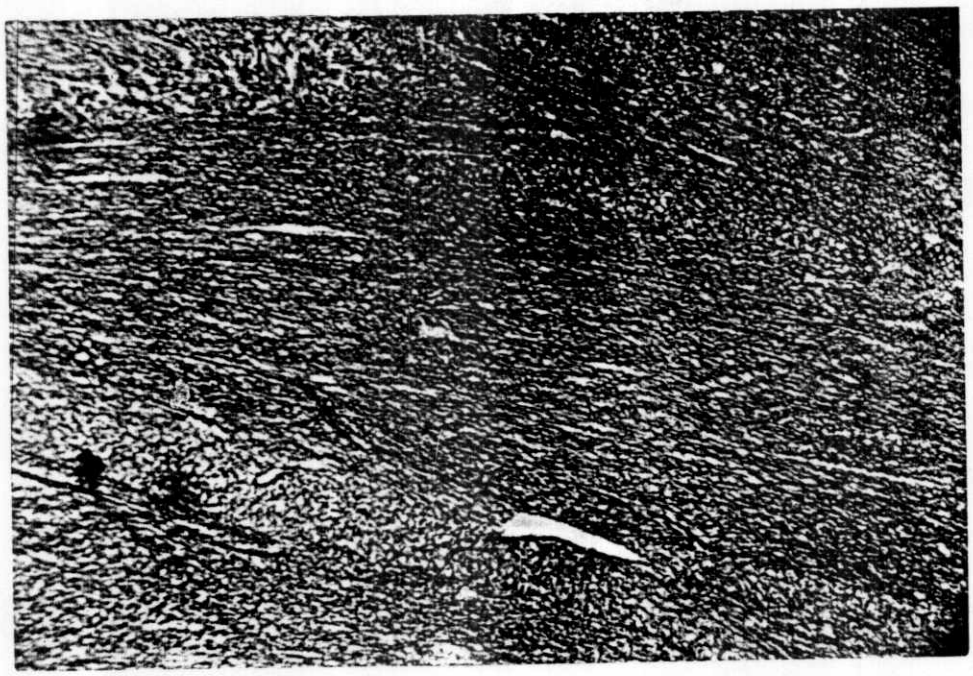
(Figure-18) : Case of M.F.H. showing pleomorphic areas arranged haphazardly, marked degree of anaplasia, giant cells and frequent mitosis (H & E x 200).



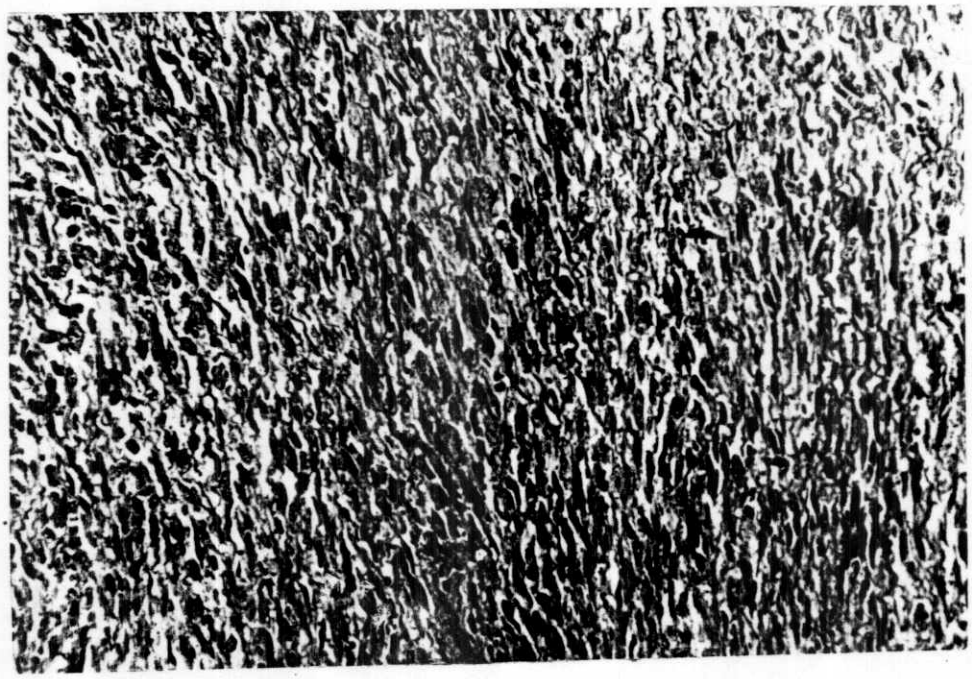
(Figure-15) : Case of high grade fibrosarcoma showing intranucleolar small and large and irregular black dots . Some dots are arranged at nuclear membrane and others are dispersed in nucleoplasm (AgNOR stain x 1000).



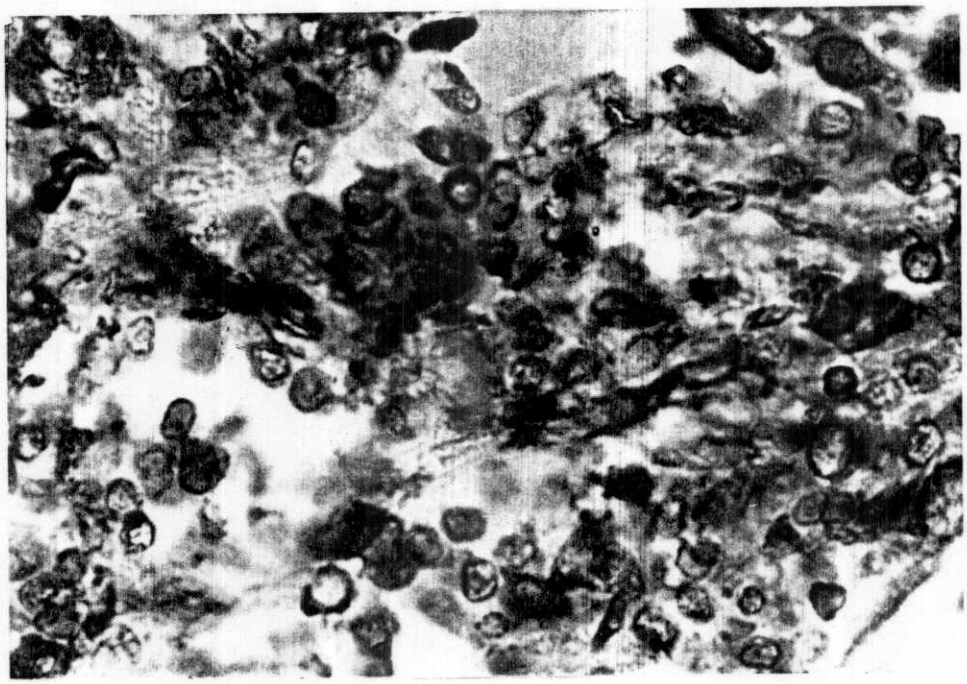
(Figure-16) : Vimentin immunostain of well differentiated fibrosarcoma showing diffuse cytoplasmic response of labeled cells (Vimentin x 400).



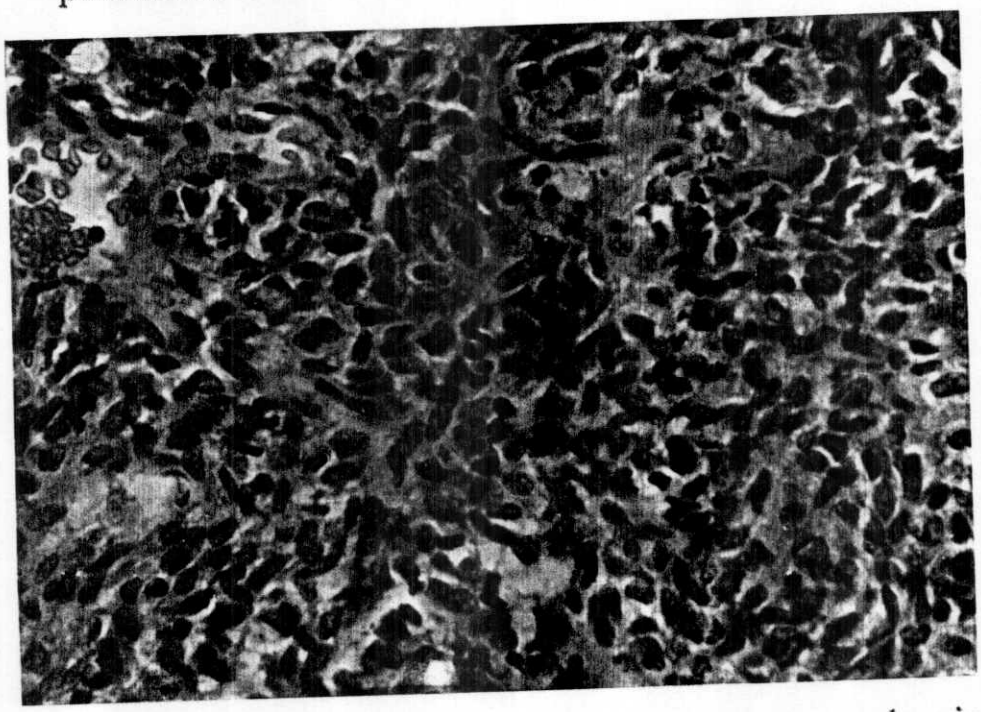
(Figure-13) : Case of well differentiated fibrosarcoma showing moderate amount of reticulin separating neoplastic cells (Reticulin x 200).



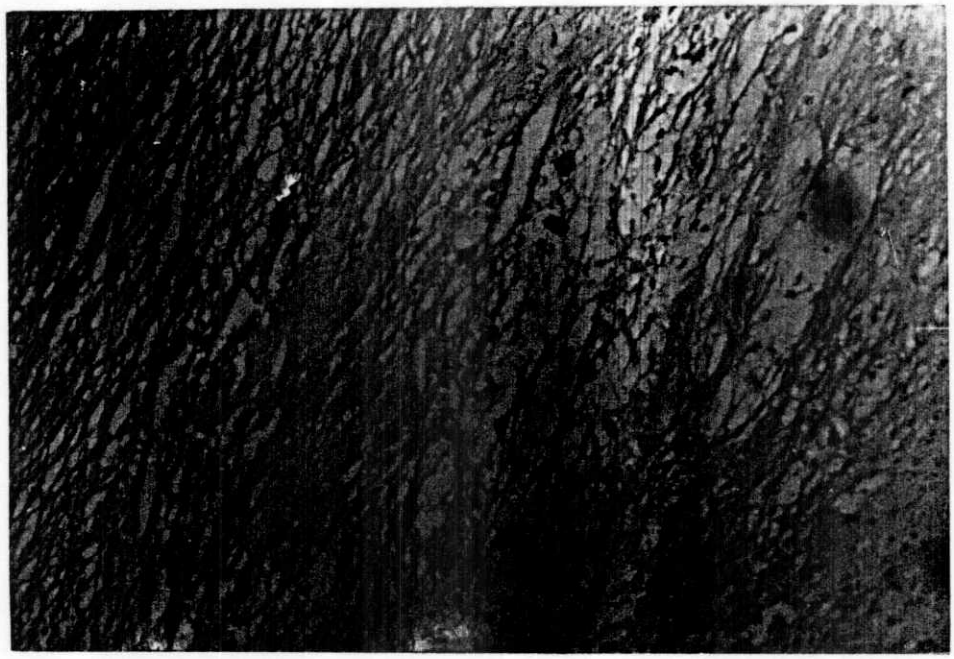
(Figure-14) : Case of intermediate differentiated fibrosarcoma showing collagen fibers separating the tumor cells (masson trichrome x 200).



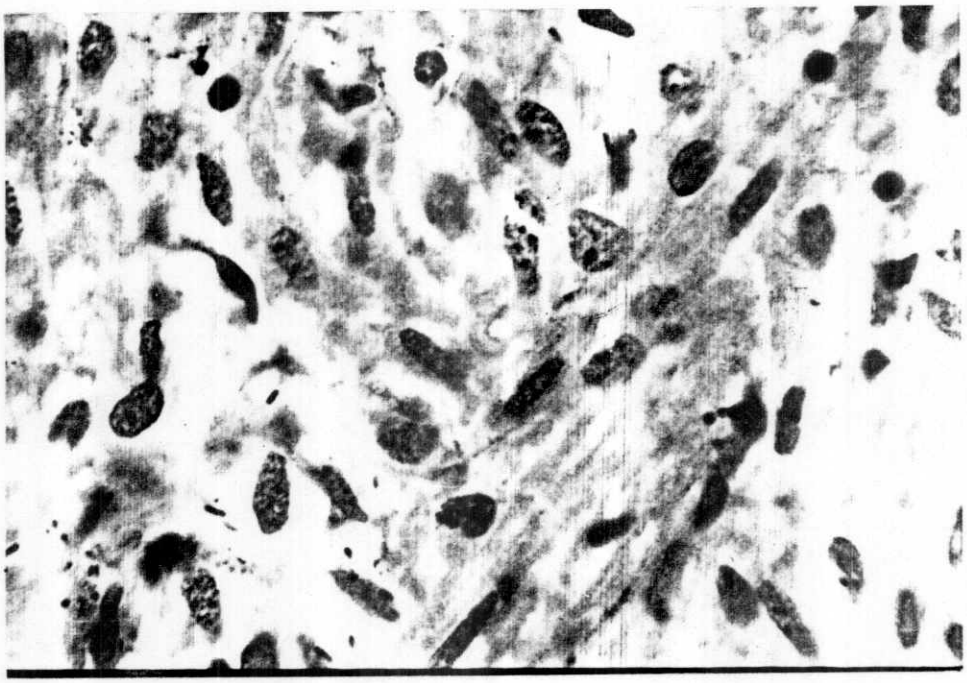
(Figure-11) : Vimentin immunostain of liposarcoma (Round cell) showing diffuse cytoplasmic response of labeled cell with perinuclear accentuation for the stain (vimentin x 1000).



(Figure-12) : Case of intermediate differentiated fibrosarcoma showing moderate degree of differentiation (herring bone) fashion in few areas, rounded nuclei and high mitotic index (H & E x 200) .

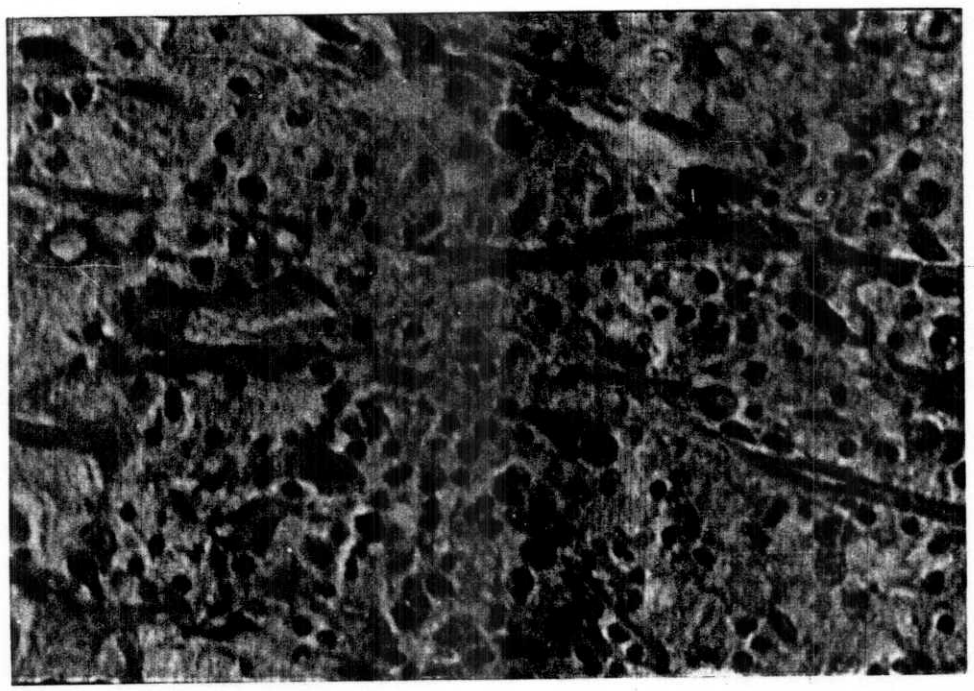


(Figure-9) : Case of myxoid liposarcoma showing mucinous matrix (Alcian blue stain x 100).



(Figure-10) : Case of low grade liposarcoma showing intranucleolar , multiple, small and large and irregular. Some arranged at the nucleolar membrane, others are dispersed in nucleoplasm (AgNOR stain x 1000).

(Figure-7) : Case of myxoid liposarcoma showing fibrillary reticulin meshwork warp the vascular channels (Reticulin x 400).



(Figure-8) : Case of round cell liposarcoma showing little capillary basement membrane (PAS x 400) .

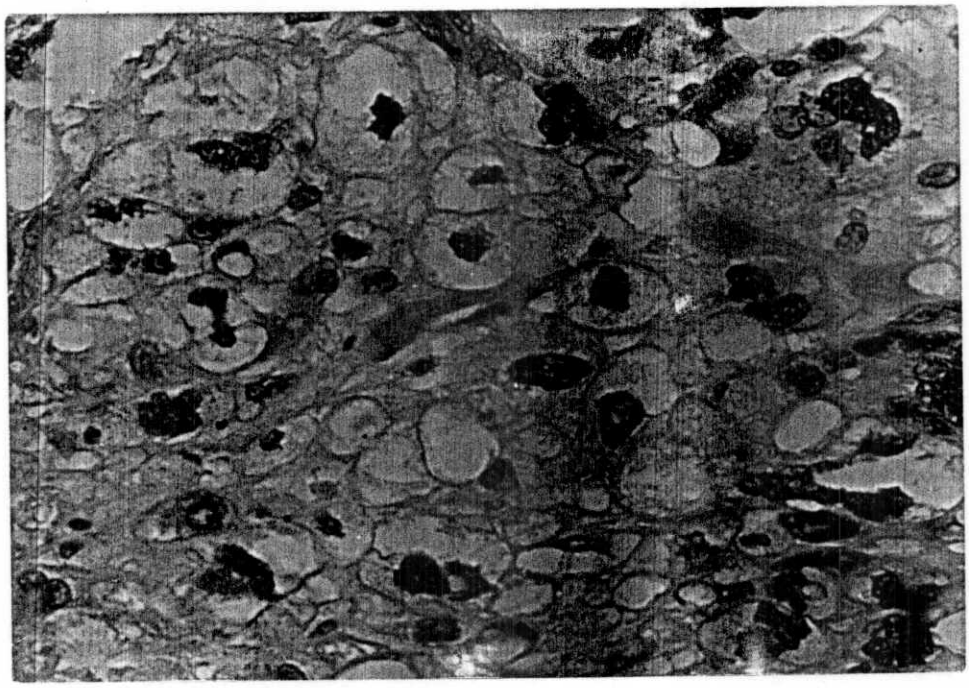
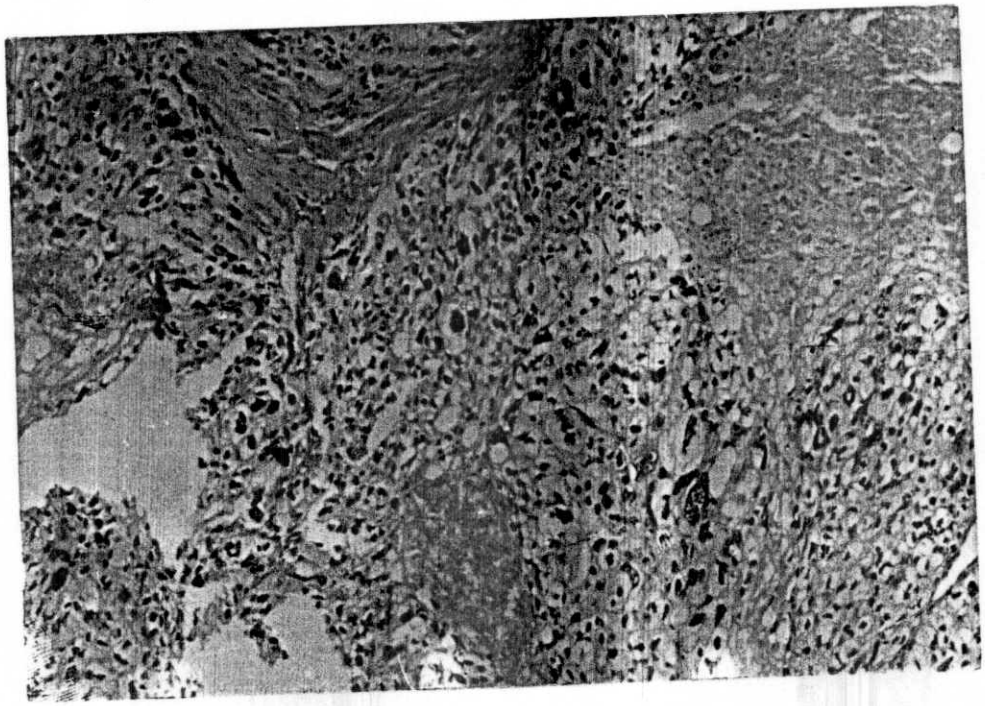


Figure-5) : Case of pleomorphic liposarcoma showing large vacuolated cells, bizarre lipoblast , signet ring lipoblast (H & E x 1000).



(Figure-6) : Case of pleomorphic liposarcoma showing areas of necroses, [illegible] lipoblast (H & E x 100) .

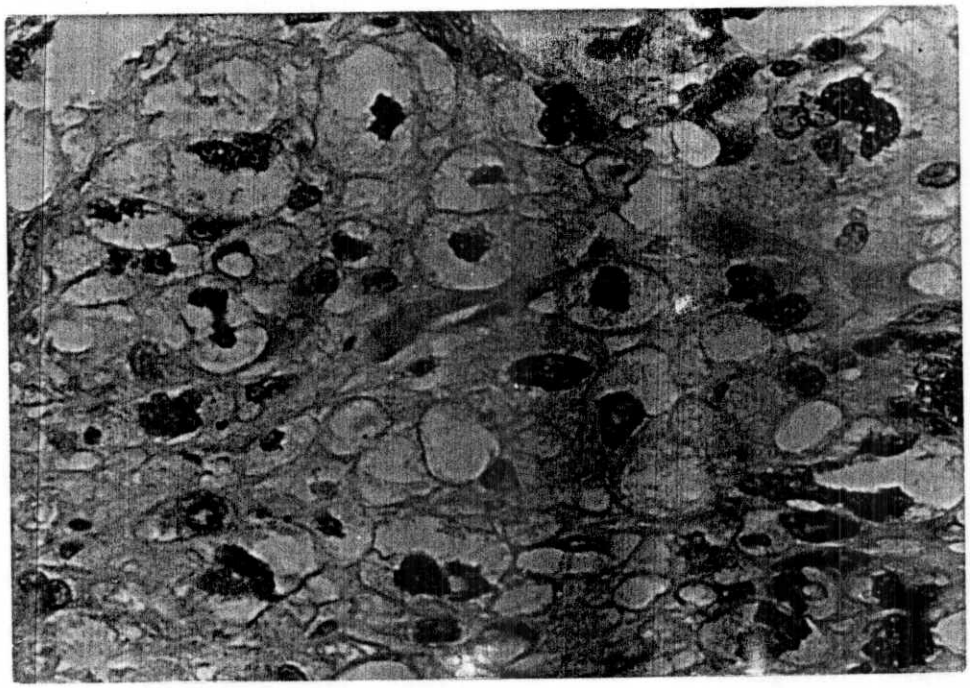
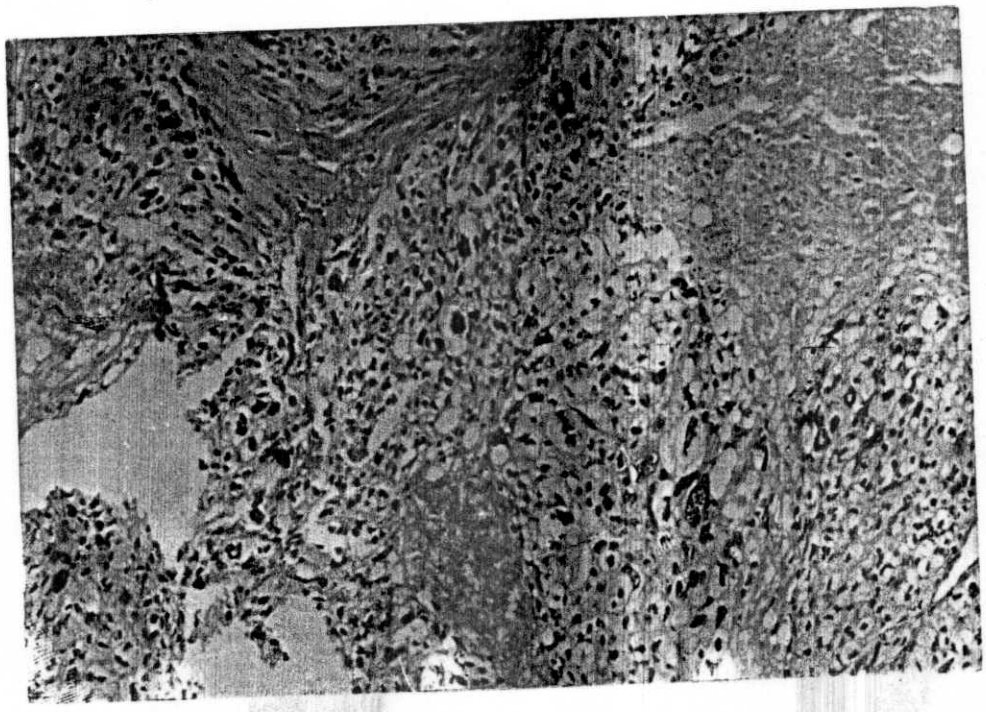


Figure-5) : Case of pleomorphic liposarcoma showing large vacuolated cells, bizarre lipoblast , signet ring lipoblast (H & E x 1000).



(Figure-6) : Case of pleomorphic liposarcoma showing areas of necroses, frequent giant cells and lipoblast (H & E x 100) .