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CYTOMORPHOLOGICAL SPECTRUM OF SOFT TISSUE TUMORS IN NORTH EAST INDIA – A HOSPITAL BASED STUDY

Pathology

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ABSTRACT

BACKGROUND: Soft tissue tumors (STT) are heterogenous group of neoplasms and initial cytological diagnosis and subtyping of STT helps in primary workup and treatment planning. Fine needle aspiration is a valuable tool for diagnosis of superficial soft tissue tumors which is cost effective rapid outdoor procedure. Objective of study is to evaluate the cytological spectrum of STT in north eastern region of India. **MATERIALS AND METHODS:** It was hospital based cross-sectional study of one year duration which included 258 cases of all age groups with clinically presenting with soft tissue swelling. Fine needle aspiration cytology was performed and smears were stained with May Grunwald Giemsa(MGG) and Papanicolaou(PAP) stain and cytological detail of STT were studied. **RESULT:** Total 258 STT tumors were studied out which 96.51% benign and 3.48% malignant. Lipoma(82.3%) was most common benign tumor and small round cell tumor(SRCT) was the most common malignant tumor(44.44%). Soft tissue tumors were common in trunk(34.4%) followed by upper extremities (29.0%). Males are more commonly affected than females M:F= 1.2. Histopathological correlation was available in 56 cases and diagnostic accuracy was 96.5%. **CONCLUSION:** Fine needle aspiration cytology(FNAC) is a valuable tool in early diagnosis of soft tissue tumors. Exact subtyping may not be possible in all cases however treatment can be planned after initial cytological diagnosis. Efficacy of FNAC can be increased by using immunocytochemistry.

KEYWORDS

Soft tissue tumors, Fine needle aspiration cytology

INTRODUCTION –

Soft tissue tumors(STT) are heterogenous group of tumors which are classified according to histogenetic basis. Benign tumors are more common than malignant tumors by ratio of about 100:1. Annual incidence is 300 per 100000 population. Soft tissue sarcomas account for about 0.8%- 1% of all cancers and 2% of all cancer death.[1]

Fine needle aspiration cytology(FNAC) is considered as one of the first investigative procedure for diagnosis of soft tissue tumors and planning treatment options. Fine needle aspiration cytology is a quick, easy and cost effective outdoor procedure without any major complications with high sensitivity and specificity. For accurate diagnosis good aspirate and well prepared smears with good quality of staining is very essential. However, missing of the representative area may occur during aspiration due to cystic, necrotic and haemorrhagic nature of the masses. Moreover besides neoplastic cells admixture of local host tissue aspiration may lead to error of interpretation. Sometime reactive and reparative growth of connective tissue may mimic neoplastic lesions. Therefore there is overlapping features of nonneoplastic and neoplastic conditions and many times nonneoplastic lesion may mimic neoplastic condition. Thorough knowledge about different types of soft tissue lesions and involvement of different cell lines along with drawbacks of FNAC are very much required to achieve high diagnostic accuracy.[2]

Present study was aimed to see the frequency and pattern of soft tissue tumors in patients attending a tertiary care center in north east India.

MATERIALS AND METHODS :

This is a cross-sectional study of one year from February 2019 to January 2020 conducted in the department of Pathology of Gauhati Medical college and Hospital. The study included 258 cases of all age groups clinically presenting with soft tissue swelling. All clinically suspected cases of STT occurring in all age groups were included in the study. Metastatic soft tissue tumors were excluded from the study. Inconclusive smears and tumors of skin and adnexal lesions were also excluded from the study. Statistical analysis was done using MS-Excel spread sheet.

FNAC was performed using a 22-27 gauge needle fitted to a 20 ml disposable syringe and staining was done using May Grunwald Geimsa (MGG) and Papanicolaou(PAP) stain. Detailed cytological examination of stained smears were carried out. Cellularity, arrangement of cells, type of cell groups, cytoplasm, nuclei and nucleolar characteristics, mitotic activity and necrosis were noted. The cytological details of all tumors were studied and broadly classify in to inconclusive/inadequate, benign, suspicious for malignant and malignant. Cytological typing was also done in to six categories of lipomatous, myxoid, pleomorphic, round cell, spindle cell and epithelioid cells. Cytomorphological subtyping was done whenever possible. Cytological grading was done using standardized protocol for cytological grading of soft tissue sarcomas.[3,4] Cytological findings were correlated with the histopathological findings whenever available.

RESULTS: (Tables 1,2 and 3)

There were 258 cases of STT out of which (96.5%) cases were benign and (3.48%) cases were malignant. Benign tumors are most common in 21-30 years(26.5%) age group.

Table1: Age and sex distribution of soft tissue tumors

Age in years	M	F	Total	Percentage
0-10	03	06	09	3.4%
11-20	09	09	18	6.9%
21-30	44	23	67	25.9%
31-40	29	34	63	24.4%
41-50	29	25	54	20.9%
51-60	17	12	29	11.2%
61-70	08	06	14	5.4%
71-80	04	00	04	1.5%
Total	143	115	258	100%

P= 0.16

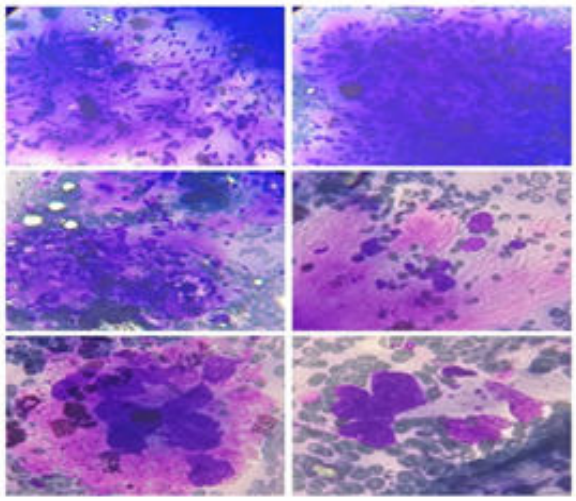

Fig 1 Pleomorphic Sarcoma (MGG stain,Low & high power view)

Table 2: Clinical and Pathological characteristics of STT

Site of swelling	Numbers	Percentage
Head and neck	56	21.7%
Trunk	89	34.4%
Upper extrimities	75	29.0%
Lower extrimities	38	14.7%
Type of tumors		
Benign	249	96.5%
Malignant	09	3.4%
Duration of swelling		
< 1year	52	20.1%
>1 year	206	79.8%
Cytomorphological category	Numbers	Percentage
Myxoid	01	0.3%
Pleomorphic	02	0.7%
Spindle cell	45	17.4%
Epithelioid/ Polygonal	01	0.3%
Round cell tumor	04	1.5%
Lipomatous	205	79.4%
Total	258	100%

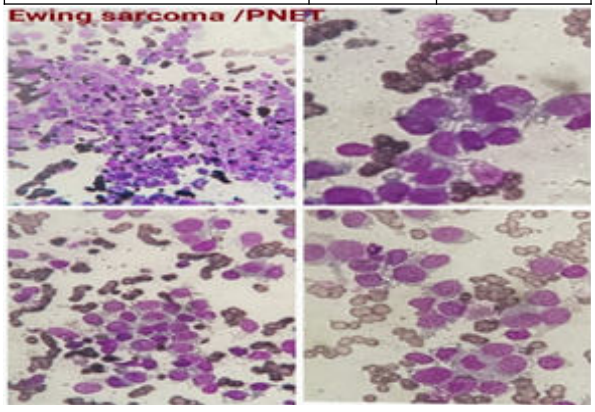

Fig 2: Small round cell tumor (Ewing's Sarcoma) (MGG stain, Low &High power view)

Table 3: Subtyping of various benign and malignant STT

Cytological type	Subtyping Benign tumors	Subtyping Malignant tumors
Lipomatous	Lipoma (202)	
	Angiolipoma(02)	
	Hibernoma(01)	
Spindle cell tumors	BenignFibrous histiocytoma(21)	Angiosarcoma(01)
	Haemangioma(02)	
	Neurofibroma(08)	
	Schowannoma(01)	
	Giant cell tumors of tendon seath(09)	
	Lymphangioma(02)	
	Superficial angiomyxoma(01)	
Myxoid tumor		Myxoid liposarcoma(01)
Round cell tumors		Rhabdomyosarcoma(embryonal)(01)
		Ewings sarcoma(02)
		Neuroblastoma(01)
Pleomophic		Pleomorphic sarcoma(02)
Epithelioid/ Polygonal		Epithelioid sarcoma(01)
Total	249	09

P<0.0001

DISCUSSION:

Soft tissue tumors (STT) can easily be diagnosed pre-operatively by FNAC. Fine needle aspiration cytology is a simple, safe and cost-effective outdoor procedure in comparison to core needle or open biopsy.[5] It is a excellent diagnostic procedure in early diagnosis of soft tissue tumors.

In the present study out of 258 STT 96.5% were benign and 3.48% were malignant which is comparable to Sone et al[6] who reported 95.3% benign and 3.34% malignant STT. However Beg et al[7] and P Arul[5] found that 82.5% and 79.6% benign tumors and 17.5% and 11.8% malignant tumors respectively. In the present study it was observed that benign tumors were more common in second to fourth decades and malignant tumors are more common in fourth to sixth decade respectively, findings are similar to P Arul,[5] Soni et al[6] and Roy et al[8].

Maximum numbers of STT were found in the trunk and upper extremities. Soni et al[6] reported maximum numbers of benign tumors in upper extremities and trunk but malignant tumors were common in lower extremities.

Lipoma was the most commonly encountered soft tissue tumor and also the most common benign tumor while small round cell tumor was the most common malignant tumor. Similar findings were reported by Beg et al[7]. However, Nagira et al[9] reported that most common benign STT was spindle cell tumor followed by lipomatous tumor while the most common malignant soft tissue tumor was pleomorphic sarcoma followed by small round blue cell tumors.

Among various cytological categories 205 cases were lipomatous tumors, 45 cases were spindle cell tumors, 4 small round blue cell tumors, 2 pleomorphic type 1 epitheloid type,1 myxoid type. Cytological subtyping of STT were done both in malignant and benign tumors(P<0.0001). Out of 249 benign tumors 205 came out as lipoma, 21 benign fibrous histiocytoma, 9 giant cell tumors of tendon sheath, 5 vascular tumors(2 lymphangiomas,1 superficial angiomyxoma,2 haemangioma) 8 neurofibroma,1 schowannoma. Sub typing of malignant tumors were done in 9 cases, out which 1 myxiod liposarcoma,1 rhabdomyosarcoma,1 neuroblastoma,2 Ewings sarcoma,2 undifferentiated pleomorphic sarcoma,1 epithelioid sarcoma,1 angiosarcoma. In the present study subtypimg of sarcoma was done in 3.4% cases. Bharat et al[10] and Costa et al[11] reported 20.9% rate while Kilpatrick et al[12] reported a range of 21-74% of subtyping of sarcoma. Our findings are lesser in comparison to these studies. It may be because of small sample size. Exact subtyping can be increased by doing immunocytochemistry. Exact subtyping is very much essential in case of small round cell tumors for proper treatment. Maximum cases in which we could not give subtyping were spindle cell tumors. It was because of hypocellular smears after repeated aspirations.

Histopathological analysis were available in 56 cases out which 52 benign tumors and 04 malignant tumors. Two cases were false negative and there were no false positive case. Diagnostic accuracy was 96.5% which is comparable to P Arul et al.[5] Hence FNAC is valuable in diagnosis of STT however it is very challenging.[13,14] Hypocellular smears due to poor or inadequate aspiration may lead to inconclusive or false negative diagnosis. In all cases clinical and radiological details are very much helpful before coming to a conclusion.

CONCLUSION:

Fine needle aspiration cytology is a rapid, cost effective and easy to perform procedure and has a definitive role in diagnosis of soft tissue tumors which help in early diagnosis and planning of surgical procedure which in turn helps in management. The diagnosis can be made with confidence on cytological examination with the help of clinical and radiological information. Cytological categorization is important and helpful. Exact subtyping can be achieved in some tumors which will be easier if we go for immunocytochemistry (ICC).

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