

Evaluation of Fine Needle Aspiration Cytology and Its Correlation with Histopathological Findings in Soft Tissue Tumours

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Abstract

A total of 105 cases of soft tissue tumours were studied by fine needle aspiration cytology (FNAC). All the cases were corroborated by histological examination. Sixty five were benign, 33 were malignant and 7 cases were inconclusive. On histopathological examination, accuracy rate of benign tumours was found to be 90.6% and that of malignant tumours was 91.3%. The overall accuracy rate was 90.8%. So FNAC is to be considered as an useful cost effective procedure for the diagnosis of soft tissue tumours.

Journal of Cytology 2007; 24 (1) : 37-40

Key Words : Soft tissue tumours, FNAC.

Introduction

Soft tissue can be defined as non-epithelial extra skeletal tissue of the body exclusive of the reticuloendothelial system, glia and supporting tissue of the various parenchymal organs. It is represented by the voluntary muscles, fat and fibrous tissue along with the vessels serving these tissues. By convention it also includes the peripheral nervous system because tumours arising from nerves present as soft tissue masses and pose similar problems in differential diagnosis and therapy. Embryologically, soft tissue is derived principally from mesoderm with some contribution from neuroectoderm. Soft tissue tumours are a highly heterogeneous group of tumours that are classified on a histogenetic basis according to the adult tissue they resemble. Within the various histogenetic categories, soft tissue tumours are usually divided into benign and malignant forms.

The use of fine needle aspiration cytology (FNAC) in the primary evaluation of a mass or tumour in the soft tissues is still debated. Its main role is for detecting suspicious recurrences or metastases. Diagnosis and classification of soft tissue tumours is one of the most difficult areas in surgical pathology. The relative absence of recognizable tissue architectural pattern in cytological preparation makes

diagnosis by FNAC even more difficult. However FNAC offers several advantages –

1. It can provide a predictive diagnosis of a benign or malignant neoplasm and in many cases also of specific tumour type.
2. If the diagnosis is of a benign neoplasm, surgery can be avoided in the elderly or other patients who are of poor surgical risk.
3. In case of a high grade malignancy or of recurrent cancers, a cytological diagnosis allows the administration of a palliative treatment.

FNAC is an out patient department procedure, necessitating neither patient preparation nor general anesthesia. It is safe, almost painless and cost effective.

In the present study, FNAC was done as an OPD procedure and its histopathological correlation was done for evaluation.

Materials and Methods

The study included 105 cases and was carried out in the Department of Pathology, IPGME&R, Kolkata. Patients with soft tissue tumours attending the surgical out patient department were selected for the study. Aspiration was carried out using a 21 gauge disposable needle and a 20 cc disposable syringe capable of producing good suction. No local

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Received : 13.03.2006; **Accepted :** 10.06.2006

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Table 1 : Age distribution of benign soft tissue tumours on FNAC

Benign soft tissue tumours	No.	0-10 years	10-20 years	20-40 years	>40 years
Lipoma	24	Nil	Nil	5 (20.83%)	19 (79.16%)
Neurofibroma	18	Nil	Nil	2 (11.11%)	16 (88.88%)
Hemangioma	6	4 (66.66%)	1 (16.66%)	1 (66.66%)	Nil
Leiomyoma	5	1 (20%)	1 (20%)	1 (20%)	2 (40%)
Benign mesenchymal lesion (could not be specified)	12	2 (17%)	3 (25%)	3 (25%)	4 (33%)
Total	65				

Table 2 : Age distribution of malignant soft tissue tumours on FNAC

Malignant soft tissue tumours	No.	0-10 years	10-20 years	20-40 years	>40 years
Rhabdomyosarcoma	6	3 (50%)	2 (33%)	1 (17%)	Nil
Fibrosarcoma	5	Nil	1 (20%)	3 (60%)	1 (20%)
Malignant fibrous histiocytoma	5	1 (20%)	1 (20%)	1 (20%)	2 (40%)
Small round cell tumour	4	2 (50%)	1 (25%)	1 (25%)	Nil
Liposarcoma	3	1 (33%)	Nil	1 (33%)	1 (33%)
Malignant mesenchymal lesion (could not be specified)	10	2 (20%)	4 (25%)	2 (20%)	2 (20%)
Total	33				

anesthesia was used. A proper histopathological examination was done in all the cases after FNAC. The FNAC report was then correlated with the histopathological report and the diagnostic accuracy of FNAC was expressed as a percentage in relation to histopathological diagnosis. Leishman-Giemsa (LG) and Papanicolaou (Pap) stains were used for the aspiration smears while hematoxylin-eosin (H&E) was used for the histopathological studies supported in some cases by periodic acid schiff (PAS) and reticulin stains.

Observations

A total of 105 cases were included in the study of which 65 (61.9%) were found to be benign soft tissue tumours, 33 (31.4%) were malignant and 7 (6.7%) cases were inconclusive on FNAC.

The age distribution of the soft tissue tumours as diagnosed by FNAC (Table 1 and Table 2) showed benign tumours were relatively common above third decade of life, while soft tissue sarcomas occurred in patients of all ages.

Male patients outnumbered the female patients in both benign and malignant categories (Table 3).

Benign tumours were roughly equally distributed across all parts of the body with a slight predilection for the upper parts, in the head and neck and the trunk region especially for the lipomas. The commonest site of involvement of the malignant tumours was the trunk (Table 4).

After the cytological diagnosis, every case was followed up to get them operated and the histological examination of the lesion was done. Table 5 and Table 6 show the histological diagnosis of the cases.

A comparative analysis of the cases diagnosed both by FNAC and histological examination was done (Table 7).

Table 3 : Sex distribution of soft tissue tumours on FNAC

Soft Tissue Tumours	Total No. of cases	No. of males	No. of females
Benign	65	40 (61.53%)	25 (38.46%)
Malignant	33	21 (63.63%)	12 (36.36%)
Inconclusive	7	5 (71.4%)	2 (28.57%)

Table 4 : Anatomical distribution of different soft tissue tumours diagnosed by FNAC

Soft tissue tumours	No. of cases	Head & neck region	Trunk	Superior extremity	Inferior extremity
Benign	65	17 (26.1%)	21 (32.3%)	16 (24.6%)	11 (16.9%)
Malignant	33	5 (15.15%)	18 (54.5%)	4 (12.12%)	6 (18.18%)
Inconclusive	7	2 (28.6%)	4 (57.1%)	Nil	1 (14.3%)

Discussion

A total of 105 cases were studied by FNAC of which 7 cases were inconclusive (6.7%). Sixty five (61.9%) were found to be benign soft tissue tumour and 33

Table 5 : Types of benign tumours diagnosed histologically

Diagnosis	Number
Lipoma	22
Neurofibroma	16
Hemangioma	10
Leiomyoma	4
Nodular fasciitis	4
Dermatofibroma	4
Benign fibrous histiocyoma	6
Schwannoma	4
Total	70

Table 6 : Types of malignant tumours diagnosed histologically

Diagnosis	Number
Rhabdomyosarcoma	5
Fibrosarcoma	4
Malignant fibrous histiocyoma	7
Small round cell tumour	4
Liposarcoma	5
MPNST	4
Leiomyosarcoma	2
Angiosarcoma	4
Total	35

(31.4%) were malignant. Out of 7 inconclusive FNAC cases, 5 were found to be benign and 2 were malignant on histopathological examination. The probable causes may be excessive fibrosis or necrotic/cystic change in the tumour. Akerman et al¹ reported in their series of 517 cases, the aspirated material was insufficient for diagnosis in 6% cases. Lindell MM Jr. et al² and Zornoza J et al³ found ultrasonography; computed tomography or magnetic resonance imaging to be helpful in finding viable tissue in extensively necrotic or cystic tumours.

Out of 65 benign soft tissue tumours diagnosed on FNAC, 12 (18.5%) were labeled as benign mesenchymal lesion as they could not be specified to a definite group. On histopathological examination, 9 cases were found to be dermatofibroma and benign fibrous histiocyoma (BFH); rest were schwannoma and hemangioma.

Thirty three cases were diagnosed as malignant soft tissue tumour on FNAC, of which 10 (30.3%) cases could not be specified to any particular group. Majority were angiosarcoma and malignant peripheral nerve sheath tumor (MPNST) on histopathology. Rest were malignant fibrous histiocyoma (MFH) and liposarcoma.

Akerman et al¹ found an erroneous cytological diagnosis in 5% of adequate smears.

Considering the 65 benign soft tissue tumours diagnosed by FNAC, specific diagnosis was made in 53 cases. Forty eight of them were confirmed by histopathology, but 5 cases showed different

Table 7 : Comparative analysis of FNAC and histological diagnosis

Concordance between in FNAC and histopathology			Discordance between in FNAC and histopathology			
Nature	Diagnosis	Number	FNAC Diagnosis	H/P Diagnosis		
Benign	Lipoma	22	Lipoma	2	Nodular fasciitis	2
	Neurofibroma	16	Neurofibroma	2	Schwannoma	2
	Leiomyoma	4	Leiomyoma	1	BFH	1
	Hemangioma	6	Benign mesenchymal lesion (could not be specified)	12	Hemangioma	1
				Dermatofibroma	4	
				BFH	5	
				Schwannoma	2	
Malignant	Rhabdomyosarcoma	5	Rhabdomyosarcoma	1	MFH	1
	Fibrosarcoma	4	Fibrosarcoma		Leiomyosarcoma	1
	Small round cell tumour	4	Malignant mesenchymal lesion (could not be specified)	10	MFH	1
	Liposarcoma	3	Inconclusive	7	Liposarcoma	2
					MPNST	3
				Angiosarcoma	4	
				Hemangioma	3	
				Nodular fasciitis	2	
				MPNST	1	
				Leiomyosarcoma	1	

BFH - benign fibrohistiocyoma, H/P - histopathology

diagnosis on histopathological examination. The accuracy rate was 90.6%.

In case of malignant lesions, out of 33 cases diagnosed by FNAC, 23 were of specific diagnosis. Twenty one cases showed similar diagnosis and 2 cases showed different diagnosis on histopathological examination. The accuracy rate came to 91.3%.

The overall accuracy rate was 90.8% considering both benign and malignant conditions.

In the study of Akerman et al¹ 85% of the benign tumours were reported as benign and 89% of the sarcomas were classified as malignant soft tissue tumours. The results of Brosjo et al⁴ are also similar. Wakely et al⁵ found 96% accuracy rate in FNAC.

From the above observations, we can conclude that FNAC evaluation of soft tissue tumours is an useful

procedure, quite safe, cost effective and accuracy rate of our study is at par with the available alternative.

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