

The Role of Fine Needle Aspiration Cytology in Diagnosis of Soft Subcutaneous Swelling

¹Dr. Archana Kumari, Tutor, Department of Pathology, B.M.I.M.S. Pawapuri, Nalanda, Bihar, India

²Dr. Juli, Tutor, Department of Pathology, B.M.I.M.S. Pawapuri, Nalanda, Bihar, India

³Dr. Dharendra Kumar, Assistant Professor, Department of Pathology, B.M.I.M.S. Pawapuri, Nalanda, Bihar, India

⁴Dr. Imtiaz Ahmad, HOD & Professor, Department of Pathology, B.M.I.M.S. Pawapuri, Nalanda, Bihar, India

⁵Dr. Rajendra Singh, HOD & Professor, Department of Surgery, B.M.I.M.S. Pawapuri, Nalanda, Bihar, India

Corresponding Author: Dr. Archana Kumari, Tutor, Department of Pathology, B.M.I.M.S. Pawapuri, Nalanda, Bihar, India.

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Abstract

Introduction: Soft subcutaneous swellings are very common benign lesions, and can occur at any site of the body. Fine needle aspiration cytology is very simple and used as primary diagnostic tool.

Aim: To study the accuracy of FNAC in diagnosis of soft subcutaneous swellings.

Method: 2-year retrospective study of clinically diagnosed soft subcutaneous swelling presenting at Pathology Department of BhagwanMahavir Institute of Medical Sciences, Pawapuri, Nalanda from June 2022 to May 2024 for FNAC. Fine needle aspirations were done. The dry and wet smears were stained by Leishman, Giemsa and Papanicolaou stain. Then, cytological and histopathological evaluation was done.

Result: 530 cases of soft subcutaneous swelling showed higher male proportion of 296 (55.85%) and female proportion was 236 (44.15%).

The most common soft subcutaneous swelling was lipoma 42.26%, followed by epidermal inclusion cyst 33.60%.

Conclusion: The diagnostic accuracy of FNAC for soft subcutaneous swelling differentiating between benign and malignant lesions is very high. However, histopathology plays very important role in diagnosing these cases.

Keywords: FNAC, Soft Subcutaneous Swelling, Histopathology, Diagnostic Accuracy

Introduction

Patients with soft subcutaneous swellings are frequently presented in various outdoor patient departments. Soft

subcutaneous swellings are the most common benign lesion. Soft subcutaneous lesions can occur at different sites of the body, although some soft subcutaneous lesions have preference for particular sites of human body. Fine needle aspiration cytology is very simple diagnostic tool in diagnosis of soft subcutaneous swelling. FNAC is a diagnostic technique which is safe, simple and cost-effective¹. It is the sampling of swelling by means of fine needle, with negative pressure applied by an attached syringe. It is an interventional cytological procedure and the purpose is to obtain diagnostic material for cytological study from the swelling. The clinical value of FNAC is not limited to neoplastic conditions only, but it is also valuable in diagnosis of infectious and inflammatory conditions. Proper history taking, assessment of sign and symptoms, and local clinical examination followed by FNAC, helps in diagnosis of cases. Some cases need histological confirmation². Ultrasound guided FNAC improves the diagnostic accuracy. The common soft subcutaneous swellings are lipoma, epidermal inclusion cysts, benign vascular lesions, cystic lesions and inflammatory conditions. Hemangiomas are common benign vascular soft swelling, derived from blood vessel cells, and often present in childhood. Thyroglossal cyst and branchial cysts are congenital anomalies. Thyroglossal cyst is mid-line neck swelling which may present at any age, whereas majority of branchial cyst swellings present in childhood. The objective of study was to know the accuracy of fine needle aspiration cytology in diagnosis of soft subcutaneous swelling and its correlation with age, sex and frequency of occurrence.

Material and Methods

This is the retrospective two-year study of all soft subcutaneous swelling referred from various

departments, such as surgery department, ENT departments, dermatology department, obstetrics and gynaecology department, medicine, paediatrics department, all other departments to pathology department of BhagwanMahavir Institute of Medical Sciences, Pawapuri, Nalanda, Bihar, India.

Duration of Study

The study was conducted for a period of two years from June 2022 to May 2024.

Inclusion Criteria

- All clinically diagnosed soft subcutaneous swelling in any part of the body of any age group.
- Adequate cellularity in aspiration

Exclusion Criteria

- Scant cellularity in aspiration
- Clinically diagnosed firm, hard, deep intramuscular and ulcerated swelling.

Sample Size: 530 cases

Method

Detailed history of patients was taken, such as age, sex, onset of symptoms. On clinical examination, findings are noted, such as location, shape, size and consistency. Under strict aseptic precautions, lump was fixed and 22 to 24 gauge disposable needle inserted into the swelling. Then needle was moved to-and-fro in different directions. 5 ml to 10 ml disposable syringe was used for suction. Both alcohol fixed and dry smears were prepared and stained by Leishman, Giemsa and Papanicolaou stain and reporting was done.

Result

Total 530 cases of soft subcutaneous swelling were included in the study from June 2022 to May 2024. Number of male patients was 296 (55.85%) and female was 234 (44.15%). Male-female ratio was 1.26. Age of patients ranged from 1 year to 86 years. Patients were

categorized into five groups based on their age: 0-20 years, 21-40 years, 41-60 years, 61-80 years and >80 years. Maximum 202 cases (38.11%) belonged to 21-40 year age group, followed by 148 (27.92%) cases in 1-20 year age group, 125 cases (23.58%) in 41-60 year age group, 47 cases (8.86%) in 61-80 year age group and 8 cases (1.50%) in >80 year age group. Most common sites of soft subcutaneous swelling were upper limb (44.15%), followed by trunk (31.69%). Most common soft subcutaneous swelling was lipomas (42.26%), followed by epidermal inclusion cyst (33.60%), inflammatory lesion (3.96%), non-diagnostic (3.4%), benign vascular lesion (3.21%), thyroglossal cyst (0.94%) and branchial cyst (0.94%).

Figure 1:

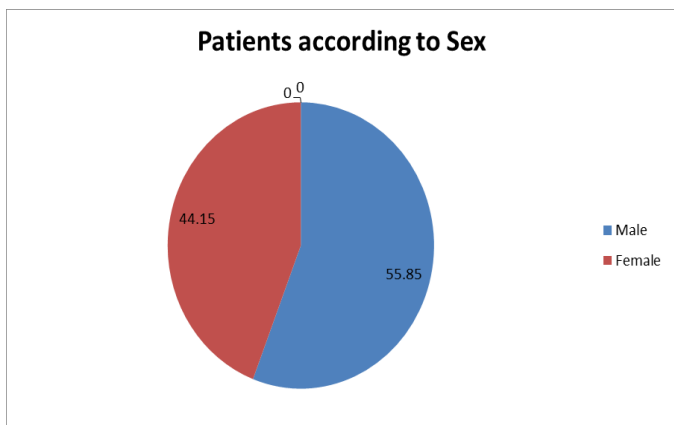


Figure 2:

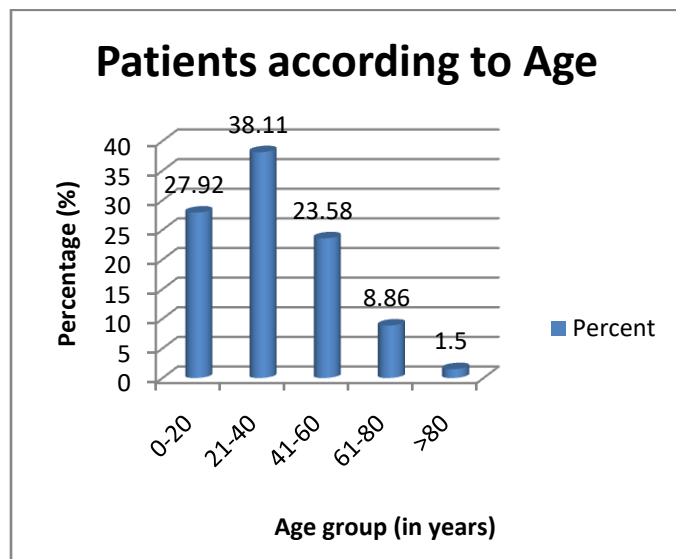


Figure 3:

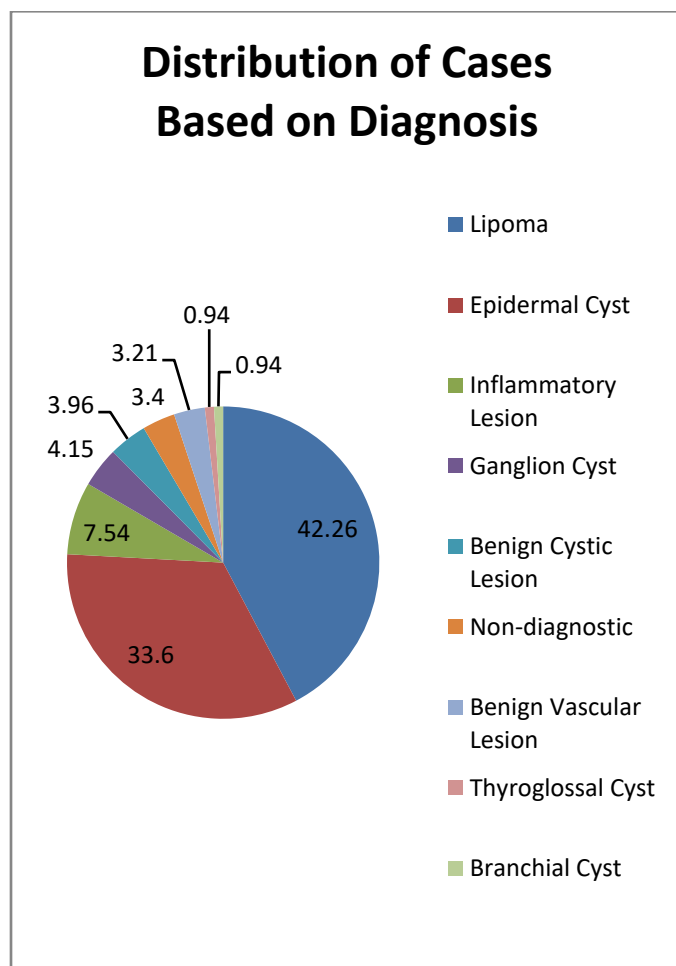


Table 1: Distribution of Lesions

Types of Lesion	Upper Limb	Lower Limb	Trunk	Head & Neck	Total
Lipoma	104	16	82	22	224
Epidermal Inclusion Cyst	80	12	68	18	178
Inflammatory Lesion	11	8	5	16	40
Ganglion Cyst	14	8	-	-	22
Benign Cystic Lesion	11	2	5	3	21
Non-diagnostic	5	2	7	4	18
Benign Vascular Lesion	9	4	1	3	17
Thyroglossal Cyst	-	-	-	5	5
Branchial Cyst	-	-	-	5	5
Total	234 (44.15%)	52 (9.81%)	168 (31.69%)	76 (14.33%)	530

Table 2: Comparison of FNAC with Histopathological Diagnosis

Number of Cases	FNAC Diagnosis	Number of Cases	Histological Diagnosis
224	Lipoma	21	Lipoma, Fibrolipoma
178	EIC	14	Epidermal inclusion cyst, Dermoid cyst, sebaceous cyst
22	Ganglion	2	Ganglion, Epidermal Inclusion Cyst
21	Benign Cystic Lesion	5	Ganglion, Mucocele
17	Benign Vascular Lesion	2	Hemangioma
5	Thyroglossal Cyst	1	Thyroglossal Cyst

Discussion

In our study subcutaneous swelling affects mostly middle age groups. The range of age was from one year to more than eighty years. Similar study was conducted by A Siddiquaet al³. Our study showed lipomas were the most common soft subcutaneous swelling with 224 cases (42.26%), similar to studies of Orellet al⁴ and Beg et al⁵. Lipoma is a benign tumour made up of fat tissues. It is small, soft, rubbery, painless swelling, located just beneath the skin. Epidermal inclusion cyst (EIC) with 178 cases (33.60%) were the second most common soft subcutaneous swelling, outof which 12 cases (6.74%) showed giant cell reaction, that resembled the study

done by Nigam et al⁶9% of the cases. Numerous synonyms for EIC exist, such as, epidermoid cyst, infundibular cyst and keratin cyst. These cysts can occur anywhere on the body. These soft subcutaneous swellings often have a central punctum. Mostly EICs are clinically diagnosed as sebaceous cysts, and must be confirmed histopathologically^[7,8,9,10].

In present study, 2 cases of filariasis were initially diagnosed as inflammatory lesions, that was identical to the study conducted by Prashant Goyal et al¹¹. Inflammatory lesions were either suppurative, granulomatous or fungal abscesses. Inadequate samples are reported as non-diagnostic. It was given in 18 cases,

which was due to scant cellularity or haemorrhagic aspirates. Scant cellularity occurs due to faulty technique or nature of lesion. Ganglion cyst or a bible cyst is a benign swelling that often appears around joints in hand or foot. It is a soft subcutaneous swelling. It is not a cyst, because the collection of clear viscous fluid is contained in cavity, which is not lined by epithelium. It usually appears spontaneously, without any particular cause. One clinically diagnosed ganglion cyst was histopathologically diagnosed as epidermal inclusion cyst. Histopathological correlation of lesions showed fair degree (97.78%) of accuracy of FNAC. The study of Roy et al¹² showed diagnostic accuracy of FNAC 90.6% of benign lesions.

Advantage of the Study

Most of the lesions were diagnosed correctly in the cytology.

Conclusion

Fine needle aspiration cytology is an invaluable, minimally invasive and highly accurate procedure for assessment of patients with soft subcutaneous swelling. It is an easier, quicker and cheaper method for the diagnosis of soft subcutaneous swelling. However, lack of architecture in FNAC makes it more difficult to categorize the soft subcutaneous swelling. Histopathological evaluation is very important to confirm the diagnosis. In our study, the efficacy of FNAC in diagnosis of soft subcutaneous swelling proved as a useful cost-effective procedure. The result showed that the diagnostic accuracy of FNAC of soft subcutaneous swelling is 97.78%.

References

1. Koss LG, Diagnostic cytology and its histopathologic basis, Vol. 2, 4thed, New York, JB Lippincott, 1992, 1268-1279.

2. Gupta R, Gupta R, Dewan D, Mahajan S, Singh P. Fine needle aspiration cytology as a diagnostic tool in nodular skin lesions. *Int J Med Sci Public Health*. 2016;5(6):1229-32.
3. Siddiqua A, Akhtar N, Khondaker L, Islam MA, Rahaman MM, Babar ZUM, et al. Evaluation of fine needle aspiration cytology (FNAC) in diagnosis of papulo-nodular skin lesion. *North Int Med Coll J*. 2015;5(2):342-4.
4. Orell SR, Domanski H. Skin and subcutis. In: Orell SR, Strett GF, Whitaker D, editors. *Fine Needle Aspiration Cytology*. Churchill Livingstone, Elsevier; 2005. P. 393-408.
5. Vasenwala S, Ahmad S, Khan MA, Beg S, Haider N, Maheshwari V. A comparison of cytological and histopathological findings and the role of immunostains in the diagnosis of soft tissue tumors. *J Cytol*. 2012;29(2):125-30.
6. Nigam JS, Bharti JN, Nair V, Gargade CB, Deshpande AH, Dey B, Singh A. Epidermal Cysts- A Clinopathological Analysis with Emphasis on Unusual Findings. *Int J Trichology*. 2017 Jul-Sep;9(3)108-112. doi: 10.4103/ijt.ijt_16_17 [Crossref] [PubMed] [Google Scholar]
7. Kamyab K, Kianfar N, Dasdar S, Salehpour Z, Nasimi M. Cutaneous Cysts- a clinicopathologic analysis of 2,438 cases. *Int J Dermatol*. 2020 Apr;59(4)457-462. doi: 10.1111/ijd.14808 [Crossref] [PubMed] [Google Scholar]
8. Al-Khateeb TH, Al-Masri NM, Al-Zoubi F. Cutaneous cysts of the head and neck. *J Oral Maxillofac Surg*. 2009 Jan;67(1)52-7. doi: 10.1016/j.joms.2007.05.023 [Crossref] [PubMed] [Google Scholar]

9. Golden BA, Zide MF. Cutaneous cysts of the head and neck. *J Oral Maxillofac Surg.* 2005 Nov; 63(11):1613-9. Doi: 10.1016/j.joms.2005.08.002 [Crossref] [PubMed] [Google Scholar]
10. Ramaswamy AS, Manjunatha HK, Sunilkumar B, Arunkumar SP, Morphological spectrum of pilar cysts. *N Am J Med Sci.* 2013 Feb;5(2):124-8. doi: 10.4103/1947-2714.107532 [Crossref] [PubMed] [Google Scholar]
11. Goyal P, Sehgal S, Ghosh S, Mittal D, Kumar A, Singh S. A Cytological Study of Palpable Superficial Nodules of Parasitic Origin: A Study of 41 Cases. *Pathol Res Int.* 2014;doi:10.1155/2014/373472.
12. Manna AK, Pathak S, Guha D, Roy S. Evaluation of fine needle aspiration cytology and its correlation with histopathological findings in soft tissue tumors. *J Cytol.* 2007;24(1):37-40.