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Fine Needle Aspiration Cytology Versus Histopathology In Head And Neck Masses In Children

Dr Sumeet Mahajan, Dr Sunil Kotwal, Dr KC Goswami

Abstract: *This prospective study includes 60 patients (33 males and 27 females) of head and neck masses under 14 years of age. The aspiration cytology was carried out in all the cases and histopathology was carried out in 52 cases only. The overall sensitivity, specificity and accuracy of FNAC in the diagnosis of head and neck masses in children was found to be 96.15%, 95.6% and 95.9% respectively. The cases where surgery was not done were 3 cases of colloid goiter with hypothyroidism, 2 cases of chronic lymphocytic thyroiditis , 2 cases of chronic parotitis and one case of sternocleidomastoid tumour.*
Keywords: *FNAC, HPE, Neck masses*

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I. Introduction

Fine needle Aspiration Cytology as a diagnostic procedure was introduced in 1930 by Martin and Ellis as a substitute of excisional biopsy with the opinion that the disadvantages of surgical biopsy like dissemination, fungation of tumour, surgical risks, mental and physical discomfort, time consumption and expenses to the patient were negligible in aspiration cytology, although biopsy is universal and established procedure for confirming the diagnosis.

FNAC has been show to be extremely helpful in evaluation of neck masses (M-Jain et al 1999) it is sensitive and minimally invasive first line investigation in the diagnosis of head and neck masses in children. It is highly accurate in isolating and determining potentially neoplastic lesions thus guiding the way for cases which truly require excision biopsy. Fine needle cytology is a procedure which provides material for definitive cytological diagnosis without the disadvantages of open surgical biopsy. Aspiration cytology because of its simplicity, early availability of result, minimal trauma and minimal chances of dissemination is now considered as a valuable diagnostic tool for benign lesions, lymphomas and metastatic carcinomas (Aslam et al, 2000). FNAC is of particular relevance in head and neck region because of the easy accessibility of target sites . In the hands of a skilled and commited cytologist accuracy exceeds 92% with a few false negatives and very occasionally a false positive report (Stell and Maran, 2000).

Fine needle aspiration cytology can be performed under local anaesthesia. There is no evidence of spread of tumour through the skin track caused by the fine hypodermic needle used with this technique.It is both diagnostic and therapeutic in a cystic swelling (Ahmad et al,2008).

II. Aims And Objectives

- To evaluate the role of FNAC as a diagnostic tool in head and neck masses in children with subsequent correlation with histology wherever possible.

III. Materials And Methods

This prospective study was conducted on 60 patients upto 14 years of age presented with head and neck masses in the Department of otorhinolaryngology, Head and Neck surgery, SMGS hospital; Govt. Medical College Jammu for a period of one year from November 2011 to October 2012.

Children of this age group presenting with preauricular sinus, preauricular fistula, postauricular fistula, postauricular abscess, branchial fistula and traumatic head and neck swellings were excluded from the study.

All such patients with head and neck masses were subjected to detailed clinical, hematological, radiological examinations and fine needle aspiration cytology (FNAC) .

In all cases, FNAC was done using a 23-guage needle fitted to a 10 ml disposable syringe. The aspirated material was smeared on glass slides, immediately fixed in 95% ethanol and stained with Leishman-Giemsa, hematoxylin and eosin and Papaniculaou stain. In all cases, where there was suspicion of tuberculosis, modified Zeihl- Neelsen staining was performed to look for the presence of acid-fast bacilli.

Surgically excised specimens were available in 52 cases which were routinely processed and stained with hematoxylin and eosin .These histopathology slides were reviewed and compared with FNAC to check the sensitivity, specificity and diagnostic accuracy of FNAC. The cases where surgery was not done were 3 cases of colloid goiter with hypothyroidism, 2 cases of chronic lymphocytic thyroiditis, 2 cases of chronic parotitis and 1 case of sternocleidomastoid tumour.

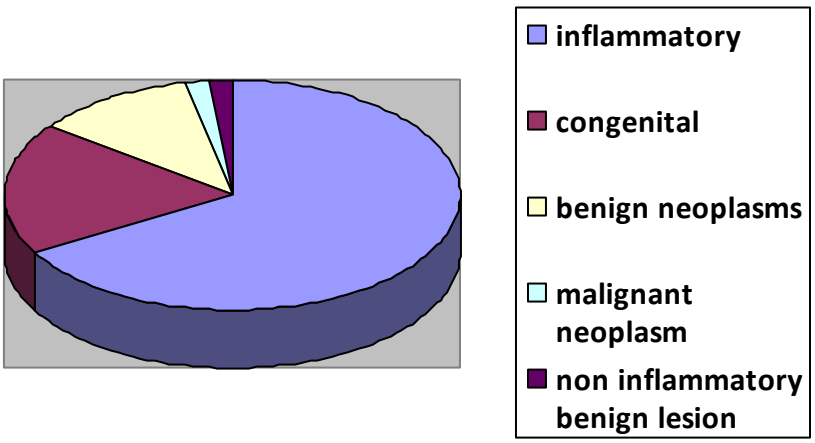
IV. Observations

Frequency of occurrence of various head and neck masses

Table 1 showing the frequency of occurrence of various head and neck masses in children based on cyto/histopathology

Type of swelling	No. of cases	Percentage(%)
Inflammatory	40	66.6
Congenital	11	18.3
Benign neoplasm	7	11.7
Malignant neoplasm	1	1.7
Non-inflammatory benign lesion	1	1.7
Total	**60**	**100**

In our study, the Inflammatory swellings formed the largest group accounting for 40 (66.6%) cases. Out of 40 inflammatory lesions, Reactive lymph nodes were the commonest forming 22 (55%) cases followed by tubercular lymph nodes forming 11 (27.5%) cases, chronic sialadenitis forming 5 (12.5%) cases and chronic lymphocytic thyroiditis forming 2 (5%) cases. Next in frequency were the congenital lesions (18.3%), benign neoplasms (11.7%), malignant neoplasms (1.7%) and non inflammatory benign lesion (1.7%) respectively.



Pie chart Showing frequency of swellings according to the cyto/histopathology.

FNAC versus histopathology:

Fine needle aspiration cytology was done in all patients where as histopathology was done in 52 cases only. In all these cases histopathology report was same as that of FNAC except in two cases , one in which the FNAC diagnosis was Non Hodgkin's lymphoma and histopathology report showed it to be tubercular lymphadenitis and the second, where FNAC diagnosis was hemangioma and histopathology report showed it to be simple cyst. Thus there was one case of false negative for tubercular lymphadenitis and one case of false positive for hemangioma.

These are shown in table 5.

The cases in which histopathology could be done were 33 cases of lymphadenitis, 3 cases of submandibular sialadenitis, 3 cases of lymphangiomas, 3 cases of dermoid, 3 cases of colloid goiter, 2 cases of hemangiomas, 2 cases of thyroglossal cysts, one case of branchial cyst, one case of aneurysmal bone cyst and one case of Rhabdomyosarcoma.

Table 2 shows FNAC and Histopathology Reporting

Tissue	No. of cases	FNAC	Histopathology
Lymph node	33	22- reactive 10- tubercular 1- Non Hodgkin lymphoma	22- reactive 11- tubercular
Thyroid swellings	3	Colloid goiter	Colloid goiter
Salivary glands	3	Submandibular sialadenitis	Submandibular sialadenitis
Swelling neck and face	3	lymphangioma	lymphangioma
Swelling pre and postauricular	3	Dermoid	Dermoid
Swelling cheek	2	Hemangioma	1-hemangioma 1- simple cyst
Swelling midline neck	2	Thyroglossal cyst	Thyroglossal cyst
Swelling Rt. Upper neck	1	Branchial cyst	Branchial cyst
Swelling chin	1	Aneurysmal bone cyst	Aneurysmal bone cyst
Swelling nose and cheek	1	Rhabdomyosarcoma	Rhabdomyosarcoma

One case was diagnosed as Non Hodgkin lymphoma on FNAC and HPE reported it as tubercular lymphadenitis and the second case was diagnosed as hemangioma on FNAC and HPE reported it as simple cyst. In all other cases, FNAC report matched with histopathology. Thus there was one case of false negative for tubercular lymphadenitis and one case of false positive for hemangioma.

The overall sensitivity,specificity and accuracy of FNAC to diagnose head and neck masses in children thus calculated are 96.5%, 95.6% and 96.15% respectively.

V. Discussion

The present study was done to evaluate the role of FNAC in diagnosing head and neck masses in children. The study comprised of 60 cases with head and neck swellings who attended the ENT department of SMGS Hospital, Jammu during the period November 2011 to October 2012. All the cases were subjected to detailed history and complete ENT examination, general physical examination, hematological and radiological examinations.. All the cases were subjected to FNAC. Among 60 cases, excisional biopsy was done in 52 cases only.

In the present study, Inflammatory lesions formed the largest group accounting for 40 (66.6%) cases. Out of 40 Inflammatory lesions, Reactive lymph nodes were the commonest forming 22 (55%) cases, followed by tubercular lymph nodes forming 11 (27.5%) cases, chronic sialadenitis forming 5 (12.5%) cases and chronic lymphocytic thyroiditis forming 2 (5%) cases.

Next in frequency were the congenital lesions forming 11 (18.3%) cases which includes 3 cases of lymphangiomas (27.3%), 3 cases of dermoid cysts (27.3%), 2 cases of hemangioma (18.2%), 2 cases of thyroglossal cysts (18.2%) and 1 case of branchial cyst (9%).

Benign neoplasms constitute 7 (11.7%) of the total cases. These includes 6 cases (85.7%) of colloid goiter and 1 case of aneurysmal bone cyst (14.3%).

Non inflammatory benign lesion constitute one case (1.7%) of sternocleidomastoid tumor.

There was only one case (1.7%) of malignant neoplasm and that was Rhabdomyosarcoma.

In the present study, histopathology was done in 52 patients and malignancy was found only in one case (1.9%) and rest 51 (98.1%) cases were found benign which is in accordance with the literature.

Jain et al (1991), in their study on pediatric head and neck lesions in 748 children (age 0 to 12 years), found 1.5% cases as malignant and 98.5% cases as benign**. Liu et al (2001),** in their study on 40 children with head and neck masses (3months to 18 years of age) found 92.5% as benign and 7.5% as malignant**. Annam v et al (2009),** in their study on 336 children (1 month to 12 years) with significant cervical lymphadenopathy found 95.5% cases as benign and 4.5% cases as malignant. **Dhingra et al (2010),** in their study on 270 patients (0 to 14 years) found 88.5% as benign and 11.5% as malignant.

Author(s)	Malignant	Benign
Jain et al (1991)	1.5%	98.5%
Liu et al (2001)	7.5%	92.5%
Annam v et al(2009)	4.5%	95.5%
Dhingra et al (2010)	11.5%	88.5%
Present study (2012)	1.9%	98.1%

FNAC as a diagnostic tool

In the present study, out of 60 cases in which FNAC was done, histopathological examination was done in 52 patients only. In all these, FNAC diagnosis matched histopathology except two cases, the one in which FNAC report was Non Hodgkin lymphoma but the histopathology reported it as tubercular lymphadenitis and the other case in which FNAC report was hemangioma but histopathology reported it to be a simple cyst. Thus

there was one false negative case for tubercular lymphadenitis and one false positive case for hemangioma. Thus the overall sensitivity, specificity and accuracy of FNAC in diagnosing head and neck swellings in children was found to be 96.15%, 95.6% and 95.9% respectively which was in accordance with other studies reported in the literature.

Jain et al (1991), found an accuracy of 80.7 – 100% in diagnosing head and neck swellings by FNAC**. Mahrous et al (2007),** in a study of 42 cases with head and neck swellings reported a sensitivity and specificity of FNAC to be 69% and 80% for the diagnosis of head and neck swellings. **Rapkiewicz et al (2007),** in a study of 85 children under 18 years with head and neck masses reported a sensitivity and specificity of FNAC to be 100% and 93% respectively**.**

Alam et al (2009), in a study on 128 children with head and neck tumors reported sensitivity and specificity of FNAC to be 93.3% and 95.6% respectively. **Dhingra et al (2010),** in a study on 270 children upto 14 years of age with palpable head and neck lymph nodes reported sensitivity, specificity and diagnostic accuracy of FNAC to be 91.3%, 99.1% and 98.89% respectively.

Author(s)	Sensitivity	Specificity	Accuracy
Jain et al (1991)	-	-	80.7 – 100%
Mahrous et al (2007)	69%	80%	-
Rapkiewicz et al (2007)	100%	93%	-
Alam et al (2009)	93.3%	95.6%	-
Dhingra et al (2010)	91.3%	99.1%	98.89%
Present study	96.5%	95.6%	96.15%

VI. Summary & Conclusion

In the present study , the overall sensitivity, specificity and accuracy of FNAC to diagnose head and neck masses in children were found to be 96.5, 95.6 and 96.15 respectively.

Bibliography

[1]. Al-Khateeb TH, Alzoubi F, congenital neck masses J oral maxillofacial surgery 2007 Nov;65(11):2242-7

[2]. Ali khalaf Mahrous , Abd. Elsalam H Hashem, Mohammed M Elsawy et al. Evaluation of fine needle aspiration cytology in the diagnosis of head and neck swellings in Bab Elsheria Hospital. The Egyptian journal of Hospital Medicine 2007; 27: 122-127.

[3]. Amy Rapkiewicz, Bich Thuy Le, Aylin Simsir et al. spectrum of head and neck lesions diagnosed by fine needle aspiration cytology in the pediatric population. Cancer Cytopathology. 2007; 111(4): 242-251.

[4]. Aslam M, Hassan SM, Hassan SA. Fine needle aspiration cytology versus histopathology in cervical lymphadenopathy. Ind J Otolaryngol Head Neck surg 2000; 52(2): 137 – 40.

[5]. Burton F.Jaffe M.D. pediatric head and neck tumors. The laryngoscope 1973 oct ; 83(10):1644-51

[6]. Dave B, Shet T, Ramadwar M et al . Cytological evaluation of head and neck tumors in children – a pattern analysis. Diagnostic Cytopathol. 2006; 34: 434 – 46.

[7]. Deepti Agarwal, Suprabha Sharma, Shyamoli Dutta et al . Evaluation of fine needle aspiration cytology as a diagnostic tool in pediatric head and neck masses. Pathology and Lab. Medicine International 2010: 2.

[8]. Dhingra Vishal, Misra V, Mishra R et al . Fine needle aspiration cytology as a diagnostic tool in pediatric lymphadenopathy. Journal of Clinical and Diagnostic Research 2010; 4(3): 2452 – 2457.

[9]. E S Liu, J M Bernstein, N Sculerati et al. Fine needle aspiration biopsy of pediatric head and neck masses. Int. J Pediatric Otorhinolaryngol 2001 Aug 20; 60(2) : 135 – 40.

[10]. Fernandes H, D' Souza C R . Role of fine needle aspiration cytology in palpable head and neck masses. Journal of clinical and Diagnostic Research. 2009 Oct; (3): 1719 – 1725.

[11]. Kiran Alam, Roobina Khan , Anshu Jain et al . the value of fine needle aspiration cytology in the evaluation of pediatric head and neck tumors. Int. J Pediatr Otorhinolaryngol 2009 Apr 16.

[12]. M.Jain, D.D. Majumdar, K. Agarwal. FNAC as diagnostic tool in head and neck lesions. Indian pediatric 1999;36:921-2

[13]. Raju Kakkar PK, Das DK and Dhingra Pl role of fine needle aspiration biopsy in head and neck tumours. J Laryngolootology 1988; 102:248-257.

[14]. Rizwan A. Khan, Shagufta Wahab, R S Chana et al . children with significant cervical lymphadenopathy; clinicopathological analysis and role of fine needle aspiration in India. J Pediatr (Rio J.) Vol. 84 no. 5 porto Alegre Sept/Oct 2008.

[15]. Schelkun P M , W.G Grundy. Fine needle aspiration biopsy of head and neck lesions. Journal of oral and Maxillofacial surgery . 1991; 49(3): 262 – 267

[16]. Subhabrata Sengupta, Ranabir Pal, Somnath Saha, S. P. Bera, Indranil Pal and Isha Preet Tuli. Journal of Indian association of pediatric surgeons 2009; 14(4):200-203.

[17]. Tariq Ahmad, Mohammad Naeem, Siddique Ahmad et al. Fine needle aspiration cytology and neck swellings in the surgical outpatient. J Ayub Med Coll Abbottabad 2008; 20(3).

[18]. Torsiglieri AJ, Tom LW, Ross AJ et al, Pediatric neck masses. Int Journal of Pediatric Otorhinolaryngology. 1988 Dec; 16(3):199-210.

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