

Original Research Article

Clinicopathological study of pediatric neck masses

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ABSTRACT

Background: Pediatric neck masses are a reason for anxiety for both patients and doctor as there can be chances of malignancy. There are few established guidelines for evaluation. The etiology is varied so a thorough knowledge of clinical presentation is essential.

Methods: A clinicopathological analysis of 150 cases of neck masses in children upto 12 years of age attending the outpatient clinic between Jan 2015 to June 2016 were included.

Results: Maximum cases of reactive lymphadenopathy were found in our study 81 (20.7%), 23 (14.7%) thyroglossal cyst, 22 (14.7%) suppurative lymphadenopathy, mycobacterial lymphadenitis 20 (13.3%), dermoid cyst 17 (11.3%), branchial cyst 15 (10%), tubercular abscess 10 (6.7%), 3 cases (2%) each of Hodgkins lymphoma, lipoma, non-Hodgkins lymphoma were seen. FNAC was conclusive in 140 cases (93.4%).

Conclusions: Percentage wise inflammatory etiology was the commonest (55.4%) followed by congenital (38.6%) and last was neoplastic (6 %). An orderly and sequential approach is needed to manage pediatric masses.

Keywords: Pediatric neck masses, Etiology, Diagnosis, FNAC

INTRODUCTION

Neck masses are a common complaint in children worldwide and constitute major indication for surgical consultation in many pediatric surgical centres.^{1,2} It is a cause for anxiety as chances of malignancy are there.³ Etiology is divided into three groups– inflammatory or infectious, abnormal embryonic development and neoplastic.⁴ Fortunately benign masses are more frequently encountered which are reaction to the upper airway infection.⁵⁻⁷

Problems related to precise diagnosis and proper management of a child with head and neck mass is challenging for both the surgeon and the pathologist. Lesions found in these regions can be indicative of more extensive disorder such as haemopoietic malignancy or can be a manifestations of a locally invasive and destructive process. At times it may become difficult to

distinguish between neoplastic disease and benign causes of masses in the neck. So compulsorily a comprehensive and organized work-up which consists of complete history, ear, nose, throat and head and neck examination including areas such as larynx, nasopharynx and laboratory studies as per requirement should be done before biopsy and histopathological examination. This study was done to evaluate the prevalence and incidence of neck masses in children upto 12 years of age. The secondary objective was to evaluate incidence of malignant neck masses in this age group.

METHODS

The study was conducted among the children upto 12 years of age, attending the outpatient department of ENT and pediatric departments of Mahatma Gandhi Medical College and Hospital from Jan 2015 to June 2016.

A total of 150 patients were included in the study. Inclusion criteria were children upto 12 years of age with neck masses in both sexes and without any debilitating condition. Children with chronic diseases such as diabetes, epilepsy, bleeding diathesis, asthma, HIV and neck masses of vascular origin were excluded from the study.

Patients who satisfied the above criteria, the consent was taken from their parents for inclusion in the study. Selected patients were subjected to clinical examination and laboratory investigations. These included routine hemogram, sonography of neck, FNAC of mass. Where needed X-ray chest, tuberculin test and CT scan were done

Treatment was planned according to the provisional diagnosis of the mass. Excision, excisional biopsy, incision and drainage with curettage was done. The tissue retrieved by surgery was sent for histopathological examination. Patients with reactive lymphadenopathy were managed conservatively, while those with tubercular etiology were put on ATT for 6-9 months after taking opinion from Chest and TB physicians. Chemotherapy alone or a combination of CT and RT was given in cases of Hodgkins and non-Hodgkins lymphoma. Patients were followed up after 7 days, 1 month and 6 months after discharge.

Statistical analysis was done using averages and mean.

RESULTS

Maximum cases of reactive lymphadenopathy were found in our study 81 (20.7%), 23 (14.7%) thyroglossal cyst, 22 (14.7%) suppurative lymphadenopathy, mycobacterial lymphadenitis 20 (13.3%), dermoid cyst 17 (11.3%), branchial cyst 15 (10%), tubercular abscess 10 (6.7%), 3 cases (2%) each of Hodgkins lymphoma, lipoma, non-Hodgkins lymphoma were seen (Table 1).

Table 1: Etiology of neck masses in the study.

S. no.	Etiology	No.	Percentage (%)
1.	Branchial cyst	15	10
2	Cystic hygroma	3	2
3	Dermoid cyst	17	11.3
4	Hodgkins lymphoma	3	2
5	Lipoma	3	2
6	Mycobacterial lymphadenitis	20	13.3
7	Non Hodgkins lymphoma	3	2
8	Reactive lymphadenopathy	31	20.7
9	Suppurative lymphadenopathy	22	14.7
10	Thyroglossal cyst	23	15.3
11	Tubercular abscess	10	6.7
	Total	150	

Maximum patients were between the age group of 5-8 years i.e. 46.67% (70 children), followed by 9-12 years 30% (45 children).

Out of 150 children 87 (58%) were male and 63 were female (42%). Sex ratio was 1.38:1. All diseases were more common in males except mycobacterial lymphadenopathy where females were more affected than males.

Maximum number of neck masses were seen in anterior triangle of the neck i.e. 45 cases (30%) followed by 39 cases (26%) which presented as multiple swellings in neck, 32 cases (21.3%) were seen in midline, 17 cases (11.3%) were seen in sub mandibular triangle, followed by 11 cases (7.3%) in the posterior triangle and 7 cases in the submental triangle (4.67%), (Table 2).

Table 2: Distribution of neck masses according to site.

S.no.	Neck masses	Sub mandibular	Sub mental	Post triangle	Midline	Multiple	Anterior triangle
1	Branchial cyst						15 (10)
2	Cystic hygroma			3 (2)			
3	Dermoid cyst				13 (8.6)		4 (2.67)
4	Hodgkins lymphoma			2 (1.3)			1 (0.67)
5	Lipoma	2 (1.3)					1 (0.67)
6	Mycobacterial LN	1 (0.67)	1 (0.67)	2 (1.3)		11 (7.3)	5 (3.3)
7	NHL					3 (2)	
8	Reactive LN	2 (1.3)	1 (0.67)	2 (1.3)	1 (0.67)	19 (12.7)	6 (4)
9	Suppurative LN	11 (7.3)	5 (3.3)				6 (4)
10	TG cyst				18 (12)		6 (4)
11	TB abscess	1 (0.67)		2 (1.3)		6 (4)	1 (0.67)
	Total	17 (11.3)	7 (4.7)	11 (7.3)	32 (21.3)	39 (26)	45 (30)

Table 3: Histopathology and FNAC comparison.

S. no.	Histopathology	FNAC	
		Conclusive (%)	Inconclusive (%)
1	Branchial cyst	15 (10)	0
2	Cystic hygroma	3 (2)	0
3	Dermoid cyst	16 (10.7)	1 (0.7)
4	Hodgkins lymphoma	3 (2)	0
5	Lipoma	3 (2)	0
6	Mycobacterial LN	18 (12)	2 (1.3)
7	Non Hodgkins lymphoma	3 (2)	0
8	Reactive LN	28 (18.7)	3 (2)
9	Suppurative LN	22 (14.7)	0
10	Thyroglossal cyst	21 (14)	2 (1.3)
11	Tubercular abscess	8 (5.3)	2 (1.3)
	Total	140 (93.3)	10 (6.7)

Table 4: Mode of intervention in neck masses.

S. no.	Neck masses	Surgery	Conservative	Antitubercular therapy	Spontaneous recovery	Chemotherapy radiotherapy
1	Branchial cyst	15	0	0	0	0
2	Cystic hygroma	3	0	0	0	0
3	Dermoid cyst	17	0	0	0	0
4	Hodgkins lymphoma	3	0	0	0	3
5	Lipoma	3	0	0	0	0
6	Mycobacterial LN	20	0	17	0	0
7	Non Hodgkins lymphoma	3	0	0	0	3
8	Reactive LN	0	4	0	27	0
9	Suppurative LN	22	22	0	0	0
10	Thyroglossal cyst	23	0	0	0	0
11	Tubercular abscess	10	0	10	0	0
	Total (%)	119 (79.3)	26 (17.3)	27 (18)	27 (18)	6 (4)

All cases of branchial cyst were found in anterior triangle of neck, 3 cases of cystic hygroma were located in posterior triangle of neck. Maximum number of dermoid cyst were located in midline i.e. 13 cases (76.47%) and rest 4 (23.53%) were located in anterior triangle of neck. Out of 3 cases of Hodgkins lymphoma 2 were located in posterior triangle of neck and 1 was located in anterior triangle of neck. 2 out of 3 cases of lipoma were seen in submandibular region and 1 was seen in anterior triangle of neck.

Out of the mycobacterial swellings, 11 were multiple swellings in the neck. 5 were located in anterior triangle, 2 in posterior triangle and 1 in submandibular triangle and 1 in submental triangle.

In all cases of NHL multiple swellings were seen in neck. In cases of reactive lymphadenopathy, 19 cases (61.29%) presented as multiple swellings in neck, 6 were seen in anterior triangle of neck. 2 swellings each in submandibular and posterior triangle and 1 swelling each in midline and posterior triangle of neck.

Majority of cases of suppurative lymphadenopathy were seen in submandibular triangle i.e. 11 cases, 6 were seen in anterior triangle of neck whereas 5 were seen in submental triangle. 6 cases of tubercular abscess were seen as multiple swellings in neck, 2 were seen in posterior triangle and 1 each in submandibular triangle and anterior triangle

Left sided swellings were more than right (39 cases). But there were equal number of midline swellings.

Most of the swellings were slowly progressive in nature 91 cases (60%). Rapidly growing neck masses were seen in Hodgkins lymphoma, NHL, reactive and suppurative lymphadenopathy.

Fever was the most common symptom in our study 45 cases (30%), followed by pain and loss of weight. All cases of NHL had loss of weight and some cases of tubercular etiology had loss of weight.

Maximum swellings smooth surface i.e. 86 cases (57.33%) whereas 61 cases (40.67%) were nodular and 3 cases (2%) had variable surface.

Maximum were having cystic consistency 58 cases (38.67%), 46 cases (30.67%) were firm. 35 cases (25.33%) were soft and rubbery/matted were seen in 11 cases (7.33%).

Out of 31 cases of reactive lymphadenopathy, upper respiratory tract infection was seen in 13 cases (41.93%) whereas in suppurative lymphadenopathy out of 22 cases upper respiratory tract infection was seen in 8 cases (36.36%).

On ultrasonography 92 swellings (61.33%) were solid which included reactive lymphadenopathy, suppurative lymphadenopathy, tubercular abscess, Hodgkins lymphoma, NHL.

58 swellings (38.67%) were cystic in nature which included branchial cyst, cystic hygroma, dermoid cyst, thyroglossal cyst.

FNAC was conclusive in 140 cases (93.33%), The FNAC findings are described in Table 3.

Intervention- The interventions done on these patients for managing the masses is shown in Table 4. In all cases of branchial cyst, cystic hygroma, dermoid cyst and lipoma surgical excision was done. Excision biopsy was done in all 20 cases of mycobacterial lymphadenitis and ATT was given. Excisional biopsy was done in 3 cases of Hodgkinns lymphoma and chemotherapy and radiotherapy was given. Out of 31 cases of reactive lymphadenopathy, 27 resolved within 7 days without any treatment. Rest of the patients was given oral antibiotics. In suppurative lymphadenopathy, incision and drainage was done followed by antibiotics. All 23 cases of thyroglossal cyst were managed surgically by Sistrunk operation. Incision and drainage was also done in tubercular abscesses and ATT was given.

DISCUSSION

In our study of 150 children we had 3 main categories– inflammatory, congenital and neoplastic neck masses. Inflammatory masses were in majority (55.4%) and included reactive lymphadenopathy, suppurative lymphadenitis, mycobacterial lymphadenitis and tubercular abscess.

Reactive lymphadenopathy constituted 31 cases (20.7%) which presented with rapidly growing multiple bilateral neck swellings with no pain in majority. Our findings were similar to the studies by Showkat et al, Lucumay et al, Ingale et al, Al Mayoof et al, Gov-Ari et al.⁸⁻¹²

Suppurative lymphadenopathy was seen in 22 cases (14.7%). They had complaints of rapidly growing neck

mass with pain and fever. Maximum swellings were in submandibular region. Symptoms of upper respiratory tract infections were seen in 8 cases. FNAC was conclusive in all the cases. Our findings were similar to Showkat et al and Mayoof.^{8,11}

20 cases (13.3%) were of mycobacterial lymphadenopathy. Females were affected more than males. They presented with mostly bilateral, slowly growing masses with history of fever and weight loss in some. Sonography reported solid nature of swelling. Kochs chest was seen in 12 cases. Tuberculin test was positive in 17 cases. Our study findings were similar to Showkat et al.⁸

Lucumay et al and Osifo et al reported a lower incidence which could be due to different demographic distribution of study population in these studies.^{9,13}

We had 23 cases (15.3%) of thyroglossal cyst in our study. All patients had slowly growing painless neck masses mostly in midline or anterior triangle of neck. Sonography showed cystic nature. Siddique et al, Hsieh et al, Al-Zoubi et al, Nicollas et al also reported thyroglossal cyst to be the commonest congenital neck mass.¹⁴⁻¹⁷ We had 15 cases (10%) of branchial cyst presenting with complaints of slowly growing painless mass in anterior triangle of neck more on left side. Our findings were similar to those by Al-Mayoof and Gov-Ari et al.^{11,12}

Incidence of cystic hygroma and lipoma in our study was 2% which was similar to Showket et al.⁸

CONCLUSION

Although lymphnode enlargement due to various causes contribute to the majority of neck masses in children. Reactive lymphadenopathy followed by mycobacterial lymphadenitis is the major cause. Still paediatric neck masses present a challenge both to the clinician as well as the surgeon. The mass can range from simple lymphadenitis to dreadful malignancy. An orderly and sequential approach is all that is needed to manage these lesions.

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