Clinicopathological profile of cervicofacial masses in pediatric patients

Showkat A. Showkat · Mohammad Lateef · Asif A. Wani · Shafqat A. Lone · Kanwaljeet Singh · Iffat Yousuf

Abstract Four hundred pediatric patients (0–12 years of age) who presented with cervicofacial masses were evaluated clinically and pathologically. Inflammatory lesions were the commonest (48%) followed by congenital and developmental malformations (26%). In inflammatory lesions, reactive lymphadenopathy was the commonest (16%) followed by tubercular lymphadenitis (11.5%). In congenital and developmental malformations hemangiomas were the commonest (12%) followed by TG cyst (6.5%). Cystic lesions (non-developmental) constituted 19%, benign neoplastic lesions 7% and malignant neoplastic lesions 2% of the cases. Males predominated the series (53.5%) and commonest age group involved was 10–12 years (20.5%). FNAB was performed in 93% of cases and HPE was available in 51.5% of cases. Sensitivity of FNAB in our series was 87.4%.

Keywords Cervicofacial masses · Lymphadenopathy · FNAB · HPE · Developmental malformations · Cystic lesions

Introduction

In the changing pattern of specialty it is essential that every ENT, Head and Neck surgeon should be familiar with the clinicopathological profile, diagnosis and subsequent management of cervicofacial masses as mass lesions in this particular anatomical region are of common cause of concern.

The etiology of cervicofacial masses range from a simple lymphadenitis [10, 11] to metastatic deposit of underlying malignancy.

Since diagnostic spectrum varies with age, sex, location, duration of symptoms, shape and size an orderly approach including detailed history, thorough clinical examination and tissue diagnosis are mandatory [10]. The knowledge that a mass may be malignant creates an obvious sense of urgency, however the evaluation should be performed in a logical and sequential fashion. The present study was designed to analyse these factors to overcome the diagnostic dilemma in the pediatric patients presenting with a cervicofacial masses.

Materials and methods

The present study was conducted in the Postgraduate Department of ENT, Head & Neck Surgery and Department of Pathology, Government Medical College, Srinagar over a period of five years (2001–2006).

Four hundred patients up to the age of 12 years who presented with cervicofacial masses were evaluated. Clinical data collected in each case included a detailed case history, general physical examination, detailed ENT examination, routine and specific investigations, FNAB and HPE (in operated cases). Final diagnosis was reached either by FNAB or HPE.

Observations

Males (53.5%) dominated the series as compared to females (46.5%). The majority of patients were between 10 and 12

S. A. Showkat (✉) · M. Lateef · A. A. Wani · S. A. Lone · K. Singh · I. Yousuf

Department of ENT, Head & Neck Surgery,
Government Medical College,
Srinagar - 190 010, India

E-mail: drshowkatent@yahoo.com

years of age (20.5%) followed by age group of 4–6 years and 8–10 years (19.5%) each.

All patients presented with a swelling or palpable mass. Associated symptoms found were fever (32.5%), pain (13.5%), sore throat (2%), discharge (1.5%) and nasal obstruction (1%).

The size of mass ranged from 1 × 1 cm to 20 × 15 cm with 57.5% of masses having a size of 2 × 4 cms at presentation.

Swelling was non-tender in majority (72.5%) with firm consistency in 40.5%, soft in 30.5% and cystic in 27%. The lesions were divided in four main groups:

- Inflammatory lesions
- Congenital and developmental malformations
- Cystic lesions other than developmental
- Neoplastic lesions

The distribution according to final diagnosis is shown in Table 1.

Most common site involved was the submandibular (34%) while as midline neck mass was seen in 8%. Site-wise distribution of cervicofacial masses is shown in Table 2. In present series 93% of patients were found to have benign cervicofacial lesions where as in rest 7%, the lesion was neoplastic. Inflammatory lesions were the commonest (48%); reactive hyperplasia of lymph nodes (16%) being the leading lesion followed by abscess (12.5%) while tubercular lymphadenitis comprised 11.5%. Congenital and developmental malformations constituted 26% of cases with hemangioma being the commonest (12%) followed by TG cyst (6.5%). Among cystic lesions (19%) of series epidermal inclusion cyst was found to be the commonest lesion (12.5%). Neoplastic lesions constituted 7% of cases, comprising 5% benign and 2% malignant lesions. FNAB was performed in 372 cases (93%). Out of 372 cases surgical intervention was done in 278 (74.7%), out of which incision and drainage was done in 46 (16.5%). The tissue for HPE was available in 206 cases. In 26 patients, FNAB did not correlate with the HPE. Sensitivity of FNAB in our series was found to be 87.4%. The mode of management in our series is shown in Table 3. Postoperative pain and edema were the complications noted in our series.

Discussion

The swellings in the cervicofacial region merit a detailed clinicopathological evaluation because of two main reasons, one being the cosmetic aspect and the other possibility of a lesion being malignant.

The lesions of cervicofacial region are visible to the patient and others and cause a constant trouble to the patient and parents.

Some of the swellings can attain a large size to be a cause of cosmetic concern. For a clinician any cervicofacial lesion may be a sign of deep seated pathology which nobody

can afford to over look. As seen in the present study, 7% of masses proved to be neoplastic in nature.

Tubercular cervical lymphadenitis constituted 46 cases (11.5%) of the total cervicofacial masses. All patients were

Table 1 Distribution of cervicofacial masses according to final diagnosis

S. No.	Lesion	No. of cases	Percentage (%)
A.	Inflammatory lesions	192	48.0
	Abscess	50	12.5
	Tubercular abscess	6	1.5
	Reactive hyperplasia of the lymph node	64	16.0
	Tubercular lymphadenitis	46	11.5
	Chronic sialadenitis	16	4.0
	Foreign body granuloma	4	1.0
	Pyogenic granuloma	4	1.0
	Dacrocystocele	2	0.5
B.	Congenital and developmental malformations	104	26.0
	Haemangiomas	48	12.0
	Thyroglossal cyst	26	6.5
	Sternomastoid tumor	8	2.0
	Lymphangioma	6	1.5
	Cystic hygroma	4	1.0
	Dermoid cyst	4	1.0
	Branchial cyst	4	1.0
	Accessory auricle	4	1.0
C.	Cysts other than developmental	76	19.0
	Epidermal inclusion cyst	50	12.5
	Sebaceous cyst/pilomatrisoma	16	4.0
	Pseudocyst of pinna	4	1.0
	Retention cyst	4	1.0
	Bone cyst	2	0.5
D.	Neoplastic lesions	28	7.0
(i)	Benign lesions	20	5.0
	Lipoma	8	2.0
	Pleomorphic adenoma	4	1.0
	Fibrous dysplasia	4	1.0
	Paraganglioma	2	0.5
	Papilloma	2	0.5
(ii)	Malignant lesions	8	2.0
	Secondary deposits	4	1.0
	Hodgkins disease	2	0.5
	Non-Hodgkins lymphoma	2	0.5

Table 2 Anatomical sites of cervicofacial masses

S. No.	Site	No. of cases	Percentage (%)
1.	Submandibular	136	34.0
2.	Submental	52	13.0
3.	Posterior triangle of the neck	36	9.0
4.	Midline neck	32	8.0
5.	Parotid	22	5.5
6.	Preauricular	22	5.5
7.	Postauricular	22	5.5
8.	Multiple neck	10	2.5
9.	Infra-auricular	8	2.0
10.	Sternomastoid	8	2.0
11.	Anterior triangle of the neck	6	1.5

Table 3 Mode of intervention

S. No.	Lesion	No. of cases	Percentage (%)
1.	Wait and watch	24	6.0
2.	Purely medical	62	15.5
	(i) Antibiotics		
	(ii) Antitubercular	36	9.0
3.	Surgical	194	48.5
	(i) Excision		
	(ii) Incision + drainage	46	11.5
	(iii) Sclerotherapy	14	3.5
	(iv) Aspiration	8	2.0
	(v) Intralesional steroids	4	1.0
	(vi) Curratage	4	1.0
4.	Radiotherapy/chemotherapy	4	1.0
	(i) Radiotherapy		
	(ii) Chemotherapy	2	0.5
	(iii) Debulking + chemotherapy	2	0.5

put on antitubercular drugs for a period of 9 months. No relapse occurred, and no further surgery was required. Similar findings were noticed by Russel and Gregory [16].

There were 64 cases (16%) of cervical lymphadenitis out of which 54 responded to conservative management, which included antibiotics and serotiopeptidase. Only 10 patients needed surgical excision. This is not in accordance with most of the authors [2]. High percentage of cure rates with conservative treatment can be attributed to seratiopeptidase which allows good penetration of antibiotics into the affected nodes.

There were 16 cases (4%) of chronic saliadenitis, out of which excision was done in 12 cases and 4 were managed conservatively. These findings do not confer with most au-

thors [1, 7, 8, 13, 14]. This percentage of chronic saliadenitis can be attributed to poor orodental hygiene.

There were 8 cases of granulomas which included 4 pyogenic granulomas and 4 foreign body granulomas. Four cases of foreign body granulomas and 2 cases of pyogenic granuloma were treated by excision and the remaining 2 pyogenic granuloma were managed conservatively. Most of the authors did not report granulomas in the pediatric age group [1, 13, 14].

There were two cases of dacrocystoceles which were managed conservatively by aspiration which was repeated twice. Ronald et al. reported a case of congenital dacrocystocele which was excised.

Congenital and developmental malformations

These lesions constituted 104 cases (26%) of all cervicofacial masses. This is in approximation with the findings of Rajesh et al. [13] where these lesions constituted 30% of all head and neck masses.

Hemangiomas constituted 48 cases (12%) of all 400 cervicofacial masses, out of which 18 were in the submandibular region, 8 in the submental region, 4 in the posterior triangle, 4 on the upper lip and two each in the supraclavicular, supraorbital, temporal, parotid, chin, preauricular and lower lip region. Females were more commonly involved than males in the ratio of 1.4:1. Out of 48 cases, 26 were treated by sclerotherapy and intralesional steroids and only 22 needed excision. Fishman and Mulliken [17] reported hemangiomas more frequently in females than males, in a ratio of 3:1, accounting for up to 12% of cervicofacial masses in infants. These observations were consistent with the present study. High incidence (12%) can be attributed to high rate of low birth weight infants (< 2500 grams) and heredity.

Lymphangiomas and cystic hygromas constituted 6 (1.5%) and 4 (1%) cases of all cervicofacial masses respectively in the present study. Four cases of lymphangiomas were in the submandibular region and 2 cases in the neck and face region. Female to male ratio was 2:1. Lymphangiomas were managed surgically. There were four cases of cystic hygromas both in the submandibular region in the present study, with a male to female ratio of 1:1. Low incidence 1.2 to 2.8/1000 has been reported by Thomas et al. [18]. Thomas et al. [18] reported a much higher rate in the male population, although the male to female ratio appears to be equal in most reports [4].

There were 26 cases (6.5%) of thyroglossal cysts in the present study, with a male to female ratio of 1.1:1. All cases were managed surgically (Sistrunk's operation) without any recurrence. Rajesh et al. [13] usually did not report any case of thyroglossal cyst in their study of head and neck masses in children, while as Connolly and Mackenzie reported 13% of cervicofacial masses in children as thyroglossal cysts [1]. The incidence of male to female ratio found in present study

Fig. 1 Lymphangioma in a 4-year-old child (preoperative)

Fig. 2 Postoperative photograph of the same patient

is consistent with other studies. Srman and Rangeesft reported 5% recurrence.

There were 4 cases (1%) of dermoid cysts, both females, in the present study, both were excised surgically. Rajesh et al. [13] reported 4% of cervicofacial masses in children as dermoids whereas Connolly and Meckenzie [1] reported 9% of cervicofacial masses as dermoids.

There were 4 (1%) cases of accessory auricles in the present study, all females and both managed surgically without complications.

In present study branchial cyst lesions constituted 3.8% of congenital and developmental malformations and both patients were males, one presented with right sided lesion and other as left sided lesion. Both were managed surgically. Rajesh et al. [13] reported incidence of branchial cyst/fistula of 4% in their study of 50 cases of cervicofacial masses in children. Connolly and Meckenzie [1], reported 25 cases (9%) of branchial remanant lesions in the histopathology of non-lymphadenomatous benign lesions 7 ($n = 64$).

Cysts

In the present study there were 76 cases (19%) of cystic lesions in 400 cases of cervicofacial masses with a male to female ratio of 1.5:1. All cystic lesions were managed surgically by excision. Cystic lesions included 50 (12.5%) cases of epidermal inclusion cysts, 16 (4%) cases of sebaceous/pilomatrixoma, 4 (1%) cases each of retention cyst and pseudocyst of pinna and 2 (0.5%) cases of mandibular bone cyst. In the present study epidermal inclusion cysts constituted 50 cases (65.7%) of 76 cervicofacial cystic lesions other than congenital cysts, with a male to female ratio of 1.5:1. 12 cases (24%) were in the submental region, 12 (24%) in postauricular region, 4 cases (8%) each in submandibular region, forehead, midline neck and preauricular region and 2 cases (4%) each in parotid, zygomatic, posterior triangle of neck, infra-auricular and nasal region. All 50 cases were managed surgically without any recurrence.

No case of epidermal inclusion cyst was reported by Connolly and Meckenzie [1] and Rajesh et al. [13].

Sebacious cysts/pilomatrixoma constituted 16 cases (21.05%) of 76 cervicofacial cystic masses with a male to female ratio of 1.6:1. Excision was done in all cases successfully without any recurrence. Ceylor (19125) reported similar observations as in the present study. Other cystic lesions included 4 retention cysts (5.26%) two males and two females in the ratio of 1:1. All were managed surgically. There were 4 cases (5.26%) of pseudocyst of pinna (2 males and 2 females in the ratio of 1:1) which were managed by aspiration and pressure bandage.

Neoplastic lesions

Neoplastic lesions constituted 28 cases (7%) of all cervicofacial masses of the present study, which included 20 cases

of (71.4%) benign and 8 (28.6%) of malignant lesions. The overall incidence of neoplastic lesions was more in females as compared to males in the ratio of 1.3:1.

Benign lesions included 8 (28.57%) lipomas, 4 (14.3%) pleomorphic adenomas of parotid gland, 4 (14.3%) fibrous dysplasia (both maxillary), 2 (7.14%) paraganglioma and 2 (7.14%) preauricular papilloma.

Malignant lesions included 4 cases (14.3%) of cervical secondary deposits of nasopharyngeal carcinoma, 2 (7.14%) cases of Hodgkins disease and 2 cases (7.14%) of non Hodgkins lymphoma. Nasopharyngeal carcinoma with secondary deposits were managed by radiotherapy while as Hodgkins disease and NHL were managed by chemotherapy.

Alexander et al. [3] in their study of 1007 cases of head and neck tumors of children, reported 30.6% malignant, 27.8% as benign, 17.4% as congenital and 24.2% and 24.2% as tumor-like conditions. The overall sex ratio was 1.5:1 in favor of males.

Healy [9] accounted primary malignant tumors of head and neck for 5% of the malignant tumors of childhood.

Out of 400 cases of cervicofacial masses, FNAB was performed in 372 (93%) cases, out of which histopathological examination was done in 206 (65%) cases.

Histopathological examination did not correspond to FNAB diagnosis in 26 cases (12.62%) which were 4 tubercular lymphadenitis for reactive hyperplasia of lymphnodes; epidermal inclusion cyst and lymphangioma for 4 cystic hygromas; 4 epidermal inclusion cysts for 4 dermoid cysts; 4 sebaceous cysts, 2 foreign body granuloma, 2 pleomorphic adenoma and 2 retention cyst for 10 epidermal inclusion cysts; and 2 epidermal inclusion cyst for sebaceous cyst/pilomatrixoma.

Mobley et al. [8] presented a series of 89 FNAB performed on pediatric head and neck masses. The sensitivity was 94.4% and specificity was 97.1%. These findings are consistent with present study.

Most common complications noted in the series were pain and edema, 6.6% each, followed by wound infection in 3.7% of cases. Recurrence was noted in 10 patients (3.7%) including 4 pseudocyst pinna (repeat aspiration was done in both cases), 2 dacrocystocele (repeat aspiration was needed), and 6 hemangiomas in which sclerotherapy was performed as initial treatment, (two needed repeat sclerotherapy and four were excised).

Connley and Meckenzie [1] studied 360 pediatric neck masses and found the complications, associated with head

Fig. 3 Left mandibular bone cyst

Fig. 4 CT scan of the same patient showing expansion of the left mandible due to cystic lesion

and neck masses as recurrence 12 cases, hypertrophic scarring 14 cases, hematoma 9 cases, wound infection 4 cases, nerve palsy 3 cases and edema 1 case. These findings were consistent with the present study.

Conclusion

Cervicofacial masses in the pediatric age group present a challenge both to the clinician as well as the surgeon. The masses range from simple lymphadenitis to dreadful malignant lesions. An orderly and sequential approach is all that is needed to manage these lesions.

References

1. Connelly AAP, Mackenzie K (1997) Paediatric neck masses – a diagnostic dilemma. *J Laryngol Otol* 111:541–555
2. Rahal A, Abela A, Arcand PH, Quintal M-C, Lebel MH and Tapiero BF (2001) Nontuberculous mycobacterial adenitis of the head and neck in children: Experience from a tertiary care pediatric center. *Laryngoscope* 111:1791–1796
3. Rapidis AD, Economidis J, Goumas PD, Langdon JD, Skordalakis A, Tzortzatos F, Anagnostopoulous D and Matsaniotis N (1988) Tumours of the head and neck in children. A clinico-pathological analysis of 1,007 cases. *J Cranio-max Fac Surg* 16:279–286
4. Bill AH and Sumner DS (1965) A unified concept of lymphangioma and cystic hygroma. *Surg Gynecol Obstetrics* 79–86
5. Camacho AE, Goodman ML and Eavey RD (1989) Pathologic correlation of the unknown solid parotid mass in children. *Otolaryngol Head Neck Surg* 101(5):566–571
6. Urquhart A and Berg R (2001) Hodgkins and Non-Hodgkins lymphoma of the head and neck. *Laryngoscope* 111: 1565–1569
7. Tunkel DE, Baroody FM and Sherman ME (1995) Fine needle aspiration biopsy of cervicofacial masses in children. *Arch Otol Laryngol Head Neck Surg* 121:533–536
8. Mobley DL, Wakely PE and Frable MAS (1991) Fine needle aspiration biopsy: Application to pediatric head and neck masses. *Laryngoscope* 101:469–472
9. Healy GB (1980) Malignant tumours of the head and neck in children. Diagnosis and treatment. *Otolaryngol Clin North Am* 3(3):483–488
10. Bergman KS, Haris BH (1993) Scalp and neck masses. *Pediatr Clin North Am* 1151–1160
11. Turner L. Tumours of head and neck, (10th ed). Chap. 4. 7: 402–408
12. Luna MA, Batsakis JG and El-Naggar AK (1991) Pathology consultation, salivary gland tumours in children. *Ann Otol Rhinol Laryngol* 100:869–871
13. Rajesh KP, Channa RS, Varshney PK and Naim M (2002) Head and neck masses in children: A clinicopathological study. *Indian J Otolaryngol Head Neck Surg* 54(4):268–271
14. Schaller RT, Schaller JF, Buschmann C and Kiviat N (1983) The usefulness of percutaneous fine needle aspiration biopsy in infants and children. *J Pediatr Surg* 18(4):398–405
15. Shashy RG, Durairaj V, Holmes JM, Hohberger GG, Thompson DM and Kasperbauer JL (2003) Congenital dacrocystocele associated with intranasal cysts: Diagnosis and management. *Laryngoscope* 113:37–40
16. Ord RJ and Matz GJ (1974) Tuberculous cervical lymphadenitis. *Arch. Otolaryngol* 99:327–329
17. Fishman SJ and Mulliken JB (1993) Hemangiomas and vascular malformations of infancy and childhood. *Pediatr Surg* 40(6):1177–1200
18. Kennedy TL, Whitaker M, Pellitteri P and Wood WE (2001) Cystic hygroma/lymphangioma: A rational approach to management. *Laryngoscope* 111:1929–1937