



## CONGENITAL MIDLINE NECK MASSES IN SOUTH INDIAN CHILDREN: A CLINICAL AND DEMOGRAPHIC ANALYSIS


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### ABSTRACT

**Background:** Midline congenital neck masses are a relatively common presentation in paediatric patients attending Otorhinolaryngology and Paediatric Surgery departments. Despite their frequency, there is limited literature on this condition, particularly in the Indian context. **Objective:** This study aims to explore the incidence of midline congenital neck masses and highlight the importance of early diagnosis and timely intervention. **Methods:** A cross-sectional retrospective study was conducted at the Sri lakshminarayana Institute of medical sciences, Puducherry, India. Medical records of children under 18 years of age presenting with congenital neck masses were analysed. Data included patient demographics, types of masses, their locations, and the diagnostic investigations performed. Findings were summarised using tables, diagrams, and pie charts. **Results:** A total of 67 cases of congenital neck masses were reviewed. The most prevalent condition was thyroglossal duct anomalies (37 cases, 55.2%), followed by dermoid cysts (16 cases, 23.9%), lymphangiomas (7 cases, 10.45%), and haemangiomas (4 cases, 5.9%). Rare presentations included cervical teratoma, ectopic thyroid, and giant congenital hamartoma, with one case each. **Conclusion:** Congenital midline neck masses are an under-recognised yet clinically significant condition that poses diagnostic and therapeutic challenges. Effective management requires a thorough understanding of these masses and appropriate surgical skills. Early diagnosis and timely intervention are essential to improving patient outcomes.

**Keywords:** Midline congenital neck masses, thyroglossal duct anomalies, dermoid cysts, paediatric surgery, early diagnosis.

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### INTRODUCTION

Neck masses are a common presentation among children seeking care in paediatric surgical centres [1, 2]. These masses can be categorised based on their aetiology into congenital/developmental, inflammatory/reactive, or neoplastic types [3]. Congenital neck masses represent a significant proportion of these cases and commonly include thyroglossal duct cysts, branchial cleft anomalies, dermoid cysts, and vascular malformations. Additionally, rarer lesions such as cervical teratomas, ectopic thyroid, and midline cervical clefts are occasionally encountered [4].

Thyroglossal duct cysts are the most frequently observed congenital neck mass, accounting for approximately 70% of all congenital neck anomalies [5, 6]. Proper diagnosis and effective surgical management, including complete excision, are essential to ensure optimal outcomes and to minimise the risk of recurrence. This requires a thorough understanding of the clinical and pathological features of these masses.

This study aims to investigate the prevalence of different types of congenital midline neck masses in children, explore their age and gender distribution, and evaluate the outcomes of surgical management with a particular focus on recurrence rates.

By enhancing the understanding of these conditions, the findings of this study seek to contribute to improved diagnosis and management strategies in paediatric surgical practice.

## MATERIAL AND METHODS

A retrospective study was conducted to analyze midline congenital neck masses in paediatric age group in our institute. Records of patients for detailed history and examination were retrieved from Department of paediatric and Sri lakshminarayana Institute of medical sciences, Puducherry, India, and were analyzed and statistical analysis was done.

## RESULTS:

Within 10 year period, total 67 cases of midline neck masses were found. Out of these, most frequent were thyroglossal duct anomalies 37 (55.2%) followed by dermoid cysts 16 (23.9%), haemangiomas 4 (5.9%) and lymphangiomas 7 (10.45%). Other rare swellings included cervical teratoma, ectopic thyroid and giant congenital hamartoma with one case each (Fig. 1).

Age of presentation varied from 4 days to 15 yrs, majority of them lying in 4 to 6 years group closely followed by 0 to 2 yrs age group. There was a male preponderance with 42 males and 25 females giving M:F ratio of 1.68:1 (Fig.No. 2).

Out of 37 cases of thyroglossal duct anomalies, 19 cases (51.35%) were of thyroglossal fistula (Fig.4a) and 18 cases (48.65%) were of thyroglossal cyst (Fig.4b). All cases of thyroglossal fistula were iatrogenic in origin i.e. due to inadvertent incision and drainage of thyroglossal cyst abscess. Thyroglossal duct anomalies were more common in males with 25 cases (67.6%) as compared to 12 female cases (32.4%) with sex ratio of 2.1:1. Predominant position was infrahyoid (59.4%) in 22 cases followed by suprahyoid (29.7%) in 11 cases, juxtahyoid (8.1%) in 3 cases and suprasternal (2.7%) in

1 case. Mean age of the patients with thyroglossal duct anomalies was 7.15 years (Table 1).

In present series, 16 cases of dermoid cyst were reported (Fig 4c). Majority were in age group of 4 to 6 years with equivocal sex distribution with 8 cases each (Table 2).

Congenital midline vascular swelling also was not a rare entity in our study. 4 cases of haemangioma (Fig.3d) were reported with 2 cases each in 0-2 year and 2 -4 year age group with no gender predilection. Major presenting complaint was ulceration and bleeding in 75% cases. 7 cases of lymphangioma were reported out of which 2 cases showed cervico-mediastinal extension. Cysts were infected in 3 cases (Fig.4a) and non-infected (Fig.4b) in remaining 4 cases. Sex ratio was 2.5:1 and presenting age group was 0-2 years in all cases.

One case each of ectopic thyroid (8 yr male), cervical teratoma (4 day female) (Fig.4c) and giant congenital hamartoma (Fig.4d) was also reported.

Diagnosis was mainly clinical though ultrasonography and Fine Needle Aspiration Cytology (FNAC) was done to confirm the diagnosis. FNAC was particularly relevant to rule out ectopic thyroid, as misdiagnosed excision can lead to permanent hypothyroidism. CT scan provides additional information regarding extent and inner composition of mass. Chest X-ray is important in cases of cystic hygroma to rule out the mediastinal extension. All the patients diagnosed with Thyroglossal cyst/fistula underwent Sistrunk procedure under general anaesthesia. In this procedure, cyst was removed along with central portion of hyoid bone with meticulous excision of persistent thyroid duct upto foramen caecum. In patients of dermoid cysts, haemangioma, lymphangioma and others, simple surgical excision was done.

Regular follow up was done monthly for 1 year for any recurrence or fistula formation. 3 cases of recurrent Thyroglossal fistula were recorded who were re-operated after 1 year.

**Table 1: Age distribution of Thyroglossal duct anomalies:**

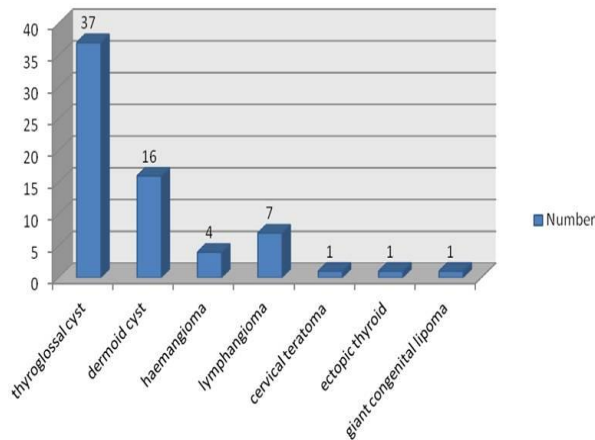
Age group (in years)	No of cases
0-2	2
2-4	6
4-6	6
6-8	5
8-10	7
10-12	6
12-14	4
14-16	1

**Table-2 Age distribution of Dermoid cysts.**

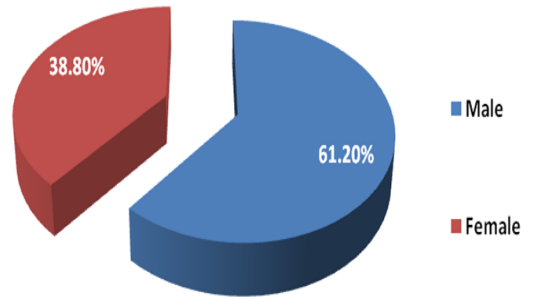
Age group(in years)	No of cases
0-2	0
2-4	3

4-6	7
6-8	2
8-10	2
10-12	2
12-14	0

**Figure 1: Different types of congenital midline neck swellings. The above table shows thyroglossal cyst to be commonest swelling (55.2%) followed by dermoid cyst (23.9%).**



**Figure 2: Sex distribution of patients with congenital neck swellings**



**Figure 3: a) thyroglossal fistula, b) thyroglossal cyst, c) dermoid, d) haemangioma**



**Figure 4: a) midline cystic hygroma (infected), b) midline cystic hygroma (non-infected), c) cervical teratoma, d) congenital giant hamartoma**



**DISCUSSION:**

Congenital neck masses are the most common non-inflammatory neck swellings. Nothing significant is documented in the literature till date regarding midline congenital neck swellings. Thus we compared our results with the data on congenital neck swellings in toto.

Siddique et al studied 36 patients and showed thyroglossal cyst (58.33%) to be the commonest midline neck swelling followed by branchial cysts (19.44%), haemangiomas (8.33%), lymphangiomas (8.33%) and dermoid cysts (5.55%) [7]. Another study by Al Khateeb et al on 252 cases also revealed thyroglossal cyst (53%)

as the most frequent swelling followed by branchial cysts (22%), dermoid cysts (11%), haemangiomas (7%) and lymphangiomas (6%) [8]. Results of our study were found to be consistent with previous studies in terms of thyroglossal cyst. However, second most common midline swelling was dermoid cyst in our study in contrast to branchial cyst which was second most common swelling in all other studies [7-9].

Patients varied in age from 4 days to 15 yrs, majority of them lying in 4 to 6 years group in our study. Siddique et al [7] reported this to be 6 to 8 years while Ayugi et al [10] found it to be 0-2 years. Our study showed a male preponderance with M:F ratio of 1.58:1 which is in agreement with Siddique et al ratio of 1.11:1. However Al Khateeb et al [8] found out a female predilection with a ratio of 1:1.2 while Ayugi et al [10] had an equivocal distribution (M:F=1:1).

Thyroglossal cyst represents most common congenital midline neck swelling. It arises from persistent thyroglossal duct. Thyroglossal fistulae on the other hand are acquired following rupture or incision of infected thyroglossal cyst. Thyroglossal duct anomalies were more common in males with 25 cases (67.6%) as compared to 12 female cases (32.4%) with sex ratio of 2.1:1. In other published series, sex ratio was 1.1:1 [7] and 1:1 [11, 12].

Mean age of the patients with thyroglossal duct anomalies was 7.15 years as compared to 7.8 years, 37.6 years and 15.4 years in studies by Ayugi et al [10], Tarcoveanu E et al [13] and Al Salem et al [14], respectively. Predominant position was infrahyoid (59.4%) in 22 cases followed by suprahyoid (29.7%) in 11 cases, juxtahyoid (8.1%) in 3 cases and suprasternal (2.7%) in 1 case. These findings were similar to Siddique et al [7] and Shih-Tsang L et al [12]. Thyroglossal cyst frequently gets infected leading to iatrogenic fistula formation. Thus in authors opinion, thyroglossal cyst should be excised as early as possible.

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Dermoid cysts are slow growing benign tumors which may occur in midline of the neck. In the neck, dermoid cysts are usually firm lumps attached to the overlying skin. In present series, 16 cases of dermoid cyst were reported. Majority were in age group of 4 to 6 years. This is contrary to Shih-Tsang et al [12] study which states that dermoid usually presents in second and third decade. There was no gender predilection.

Congenital midline vascular swelling also was not a rare entity in our study. Haemangioma being the commonest benign tumor of infancy, affects head and neck in 14 – 20% of cases. Lymphangiomas are degenerative lesions arising from lymphatics and can be classified as simple lymphangiomas, cavernous lymphangiomas and cystic hygromas. A cystic hygroma is the most common form of lymphangioma and constitutes about 5% of all benign tumors of infancy and childhood and is thought to arise from an early sequestration of embryonic lymphatic channels [11]. All cases were in age group of 0 to 4 years equally presenting in both the sexes. Siddique et al showed that 66.67% cases reported at time of birth and the remaining in second decade with M:F= 2:1 [7]. According to Krol et al, infantile haemangioma typically appears in first few weeks of life and proliferates for weeks to several months [15]. In our opinion haemangioma of neck should also be excised as early as possible since all these cases present with bleeding and ulceration

## CONCLUSION

Congenital midline neck masses constitute less talked about but important clinical entity. These masses pose diagnostic, therapeutic and surgical challenges to many clinicians. Hence, sound knowledge of these masses, timely intervention and adequate surgical skills will not only ensure proper management but also improve the final outcome as well as prognosis. This will go a long way in improving the expectancy and quality of life in these cases.

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