IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 7 Ser.2 (July. 2020), PP 36-39
www.iosrjournals.org

Cystic Neck Lesions: A Clinico-Anatomical Study

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Abstract:
Background: *Cystic lesions of neck include a wide range of congenital & acquired lesions which reflect abnormal embryogenesis in the head and neck development . A thorough knowledge of embryology and anatomy is critical in the diagnosis and treatment of these lesions.*
Materials and Methods: *Studywas conducted in the Deptt.of Otolaryngology, Tezpur Medical College in collaboration with the Deptt. of Anatomy of the same institute. A total of 25 cases were studied over a period of six months (January, 2019 to July,2019). Patients were assessed clinically and were investigated with USG& CT scans of the neck apart from routine investigations.*
Aims and Objectives:*To study the percentage prevalence, age distribution and sex incidences of cystic neck lesions in all age groups (birth to 60 years taken into account).*
Results and Observations:*Cystic neck lesions were found to occur in all age groups. Thyroglossal duct cyst and epidermoidcyst constituted the most common variants amongst all the cystic neck lesions in the congenital and the acquired groups respectively.*
Discussion:*Results obtained in the study were compared with the available established findings of other workers to draw a definite conclusion.*
Conclusion *: Cystic lesions of neck of different etiologies are quite common in day-to-day clinical practice. These lesions affect both sexes in all age groups. Adequate knowledge of development and surgical anatomy of these cystic lesions along with proper clinical evaluation and radiological investigation aids in planning judicious management strategies.*
Key Word*: Neck lesions, Cystic, Thyroglossal, Branchial, Cyst.*

Date of Submission: 19-06-2020 Date of Acceptance: 06-07-2020

I. Introduction

'Cyst' refers to a swelling consisting of a collection of fluid in a sac lined by epithelium. Cystic (congenital) neck lesions reflect abnormal embryogenesis in the head and neck development. Commonly found congenital cysts of the neck are thyroglossal duct cyst, branchial cyst, cystic hygroma, etc. Acquired cysts of the neck are basically inflammatory or neoplastic in nature. Epidermoid cyst, salivary gland cyst, etc. are acquired cysts.Thyroglossal duct cyst and branchial cleft anomalies are residual phenomena from abnormal migration of thyroid gland or resorption of branchial apparatus in utero. Cystic hygromas are lymphatic malformations resulting from local lymphatic network that fails to drain into the venous system. Although cystic hygroma may occur anywhere, most (>75%) involve lymphatic jugular sac in the posterior neck. Early diagnosis and surgical excision reduce the potential for infection and expansion of anomalies and enhance the likelihood of a successful non-recurrent outcome[1]. Cysts in the salivary glands are not unusual[2]. Plunging ranula results from extravasation of mucus below the mylohyoid muscle and presents as a painless non-mobile neck swelling. Giant ranula significantly involves parapharyngeal space besides submandibular space[3]. Therefore, a thorough knowledge of embryology and anatomy is critical in the diagnosis and treatment of these lesions.

II. Materials And Methods

Study was conducted in the Deptt.of Otorhinolaryngology, Tezpur Medical College in collaboration with the Deptt. of Anatomy of the same institute. A total of 25 cases of cystic neck lesions (excluding thyroid swellings) were studied over a period of six months (January, 2019 to July,2019). Cases were selected between the age range from birth to 60 years. All patients were asked about history related to neck swelling and relevant questions to the etiological cause, present, past and family history. Patients were assessed clinically and were investigated with USG and CT scans of the neck apart from routine investigations, followed by surgical excision ofcyst and itshistopathological examination. All the patients under study belonged to Sonitpur District of Assam.

Study design: Prospective observational study .
Study duration: January,2019 to June,2019.

Study location: This was a tertiary care teaching hospital based study done in the Department of E.N.T in collaboration with the Department of Anatomy, at Tezpur Medical College& Hospital, Tezpur, District Sonitpur, Assam.
Sample size: A total of 25 cases were studied during a period of 6 months. Both male and female cases were included in the study.
Exclusion criteria: Swellings suspected to be arising from thyroid gland were not included in the study.

III. Aims And Objectives:

To study the percentage prevalence, age-distribution and sex-incidences of cystic neck lesions in the age group between birth to 60 years of age attending tertiary health care centre in the Sonitpur District of Assam, India.

IV. Results And Observations

Our study included 25 cases of cystic neck lesions between birth to 60 years of age, presented as painless neck mass. Out of these 25 cases, 44%were male and 56% were female; M: F ratio being 1:1.3. Maximum incidence of these lesions (80%) were found to occur in cases below 30 years,11 years to 20 years showing the peak occurence of lesions (32%).In remaining 20% of cases, lesions occurred between 31 years to 60 years of age .Thyroglossal duct cyst (TGDC) occurence (28%) was found to be the commonest of all lesions affecting 16 % of female and 12% of male cases. Incidence of epidermoid cyst (20%) was also noted to be more in females (12%) in comparison to males (8%). In addition to these, lymphangioma constituted 16%,branchial cyst 12%, salivary gland cyst 12%, cystic hygroma 8% and plunging ranula 4% of all cases.

Among 7 cases of TGDC, 6 cases (24%) were found to occur in 1-30 years of age group and only 1 case (4%) in 31-60 years of age group. In case of epidermoidcyst, 3 cases (12%) occurred in the age range of 1-30 years and remaining 2 cases (8%) were in 31-60 years of age group. Results of the study are tabulatedas follows:

Table No. I: Percentage Prevalence Of Cystic Neck Lesions

Disease	No. Of cases	Percentage
Thyroglossal Duct Cyst	7	28%
Epidermoid Cyst	5	20%
Lymphangioma	4	16%
Branchial Cyst	3	12%
Salivary Gland Cyst	3	12%
Cystic Hygroma	2	8%
Plunging Ranula	1	4%

Table No. II: Age Distribution Of Cases Presenting With Cystic Neck Lesions

Age (years)	No.of cases
0-10	6
11-20	8
21-30	6
31-40	2
41-50	1
51-60	2

Table No. III: Percentage Prevalence Against Age Distribution

Type of lesion	0-30 years	31-60 years
Thyroglossal Duct Cyst	6 cases (24%)	1 case (4%)
Epidermoid Cyst	3 cases (12%)	2 cases (8%)
Lymphangioma	4 cases (16%)	0 case (0%)
Branchial Cyst	3 cases (12%)	0 case (0%)
Salivary Gland Cyst	2 cases (8%)	1 case (4%)
Cystic Hygroma	2 cases (8%)	0 case (0%)
Plunging Ranula	0 case (0%)	1 case (4%)

Table No. IV: Sex-Incidence(Total Case Lesions)

Male(M)	Female(F)
11	14

Table No. V: Sex-Incidence (Individual Case Lesions)

Type Of Lesion	Male (M)		Female (F)	
	Number	Percentage (%)	Number	Percentage(%)
Thyroglossal Duct Cyst	3	12%	4	16%
Epidermoid Cyst	2	8%	3	12%
Lymphangioma	2	8%	2	8%
Branchial Cyst	2	8%	1	4%

Salivary Gland Cyst	1	4%	2	8%
Cystic Hygroma	0	0%	2	8%
Plunging Ranula	1	4%	0	0%

V. Discussion

Any cystic lesion in the head and neck region isof great concern to the surgeondue to their diagnostic dilemma. Any patient presenting with cystic neck lesion has to be examined clinically as well as through proper radiological investigations and pathological tests. In our present study, different data were obtained regarding percentage prevalence, age incidence and sex preponderance of these lesions. The results so obtained in the present study were compared with different studies by other workers.

In our study, the majority of lesions presented as painless neck mass similar as compared to Al-Khateeb TH *et al*., study[4]. Male to female ratio was observed to be 1:1.3 in our study (Table No.IV) similar to his study (1:1.2), with most lesions affecting female. In contrast, study by Yi-Yueh Hsieh *et al*.,[5] revealed a M:F ratio of 1:6 . In our study, maximum incidence of these lesions were observed in the age range between 0-30 years, mean age of presentation being 16 years showing maximum no of cases (32% in our study, refer Table No. II). Thesefindings are similar to those as reported by Al-Khateeb TH *et al*[4]., and other previous reporters[6].

In our study, incidences of TGDC was 28%, epidermoid cyst 20%, lymphangioma 16%, branchial cyst 12%, salivary gland cyst 12%, cystic hygroma 8% and plunging ranula 4% (Table No.I). In the study by Al-Khateeb TH *et al*.,[4]the most frequent mass reported was TGDC (53%), followed by branchial cyst (22%), dermoid cyst (11%), haemangioma (7%) and lymphangioma (6%). In the study by Yi-Yueh Hsieh *et al*.,[5], TGDC accounted for 54.68% of all cases followed by cystic hygroma (25.08%) and branchial cyst (16.31%).

In our present study, the TGDC constituted the most common congenital cystic mass of neck, involving 16% female and 12% male (Table No.V). Out of 7 cases of TGDC, 1 was supra-hyoid in location and remaining 6 were infra-hyoid in location. They were noted during first decade of life as soft tissue mass located on the midline of neck. Sistrunk operation was done in 3 patients and excision was done in remaining 4 patients. Post operativehistopathological examination revealed all of them to be TGDCs. No recurrence were noted in any of the masses during the last one year period.

Branchial cleft anomalies represent a variety of congenital defects that arise from aberrations in the embryonic development of the branchial apparatus, which gives rise to the ear and mesodermal structures of the head & neck[7]. They do not demonstrate a gender predilection and most often present in individuals between 10 and 40 years of age[8]. Branchial cleft anomalies can present as cysts, sinuses, fistulas, or a combination thereof, with cysts being the most common[9]. Four branchial cleft anomalies have been described in the literature, with the second branchial cleft cyst being the most common[7,8,10]. Subclassification of second branchial cleft cysts was originally described in 1929 by Bailey with four subcategories based on location[11]. The type II branchial cleft cyst is the most common located posterior to the submandibular gland, lateral to the carotid sheath, and medial to the sternocleidomastoid muscle[8-11]. In our present study, 12% cases of the total cases presented with branchial cyst, 8% male and 4% female. One of the cases presented with secondary abscess formation. These cystic lesions were found to occur along the anterior border of sternocleidomastoid muscle. Median age of presentation of branchial cyst was 13 years in our study(Table No.II) as compared to Yi-Yueh Hsieh *et al*.,[5] , where it was reported to be 11 years.

Cystic hygromas are thought to arise from a failure of the lymphatic system to communicate with the venous system in the neck and is most frequently found in the lateral cervical region. Complete excision is the only treatment, which guarantees no recurrence or minimal recurrence (3%)[12]. Yi-Yueh Hsieh *et al*.,[5] reported the occurence of 25% of cases of cystic hygroma in his study which was the second most common paediatric cystic lesion of neck. This study reported an incidence of 8% cases of cystic hygroma, all seen in female.

In addition to congenital development, lymphangioma can be acquired; which can arise from trauma(including surgery), inflammation or destruction of lymphatic drainage pathway. Surgery is indicated at whatever age the patient presents, esp. whenever there is an increase in the cyst size, haemorrhage or infection[13]. In our study, we encountered 4 cases, all in the left side of the neck. All patients underwent successful excision.

Amongst the acquired group of cystic neck lesions, epidermoid cysts constituted the most common variant accounting for 20% of total number of cases(8% male, 12% female). All patients underwent complete surgical excision.

In our study, one case of plunging ranula involving submandibular space was encountered. Pre-operative assessment of its extension was done by CT scan and treated by excision of sublingual gland via external approach. Along with it, there were 3 cases of salivary gland cysts- 1 parotid & 2 submandibular gland cysts. Excision of gland along with cyst was carried out.

VI. Conclusion:

Cystic neck lesions of different etiologies are quite common in day-to-day clinical practice. A wide spectrum of lesions can present as cystic neck mass which need to be diagnosed and treated carefully. Thyroglossal duct cyst and epidermoid cyst were found to be the most common variant of cystic neck lesions amongst congenital and acquired group respectively in our study. Since each type of cyst has its unique location in the neck and is highly associated with its embryonic origin, complete and precise clinical information is a prerequisite in order to make an accurate diagnosis of these lesions. Knowledge of embryology, surgical anatomy and pathology along with proper clinical evaluation followed by radiological investigation aids in planning judicious management strategies. This study may be helpful in some way to the otolaryngologists and head & neck surgeons who quite often encounter these type of lesions in their day-to-day clinical practice.

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Dr. Malabika Debi, et. al. "Cystic Neck Lesions: A Clinico-Anatomical Study." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(7), 2020, pp. 36-39.