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A Clinical Study on Second Branchial Cleft Anomalies

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Abstract: ***Objective: To study second branchial cleft anomalies in respect of its age and sex distribution and clinical presentation. Study design: Prospective study. Setting: Department of ENT, Burdwan Medical College & Hospital, Burdwan & NRS Medical College, Kolkata, West Bengal. Method: 30 patients with second branchial cleft anomalies, presented in the Department of ENT of two state medical collegesfrom March 2017 and February 2019, were evaluated and treated surgically. Conclusion: The most common branchial arch anomaly occurs with second arch. Branchial cyst are more frequently seen than sinuses and fistula, but fistulae are not so rare. There is no gender predilection. Its tend to occur more often on the right side. The majority of patients (approximately 60%) were diagnosed and treated during their childhood. Complete surgical excision was done to prevent recurrences.***

Keywords: second branchial cleft anomalies, branchial fistulae, branchial cysts, branchial sinus,

1. Introduction

The term branchial cyst was first coined by Ascherson in 1832.He suggested that these cyst were results of impaired obliteration of branchial clefts[1].

By the end of the 4th week of embryonic life, the branchial arches and the mesenchyma are easily recognizable. Five pairs of ectodermal clefts (grooves) and five endodermal branchial pouches separate the six arches, with a closing membrane located at the interface between the pouches and the clefts[2,3].

Anomalies of branchial derivation should always be considered in the differential diagnosis of a mass in the neck, particularly in children but also in adults. This is the second most common masses of congenital origin in mid line of neck. Most common being thyroglossal cyst. But they are the most common congenital masses presenting in the lateral neck[4]. These anomalies can manifest anywhere from the auricular region to the supraclavicular fossa & most commonly located in the anterior neck, lateral to the midline & medial to the sternocleidomastoid muscle. Branchial cleft anomalies are bilateral in about 1% of the cases, without any proclivity to one side (right or left) in which they develop[5].

It can present as a cyst, sinus, or fistula. The differential diagnosis of branchial cysts includes dermoid cysts & lymphatic vascular malformations. Infected branchial cysts can mimic suppurative cervical lymphadenitis. Cystic malignant metastases must be ruled out in adults. The physical presence of a cutaneous sinus or fistula tract strengthens this diagnosis.

The surgical management varies depending on the cleft or pouch of origin & whether the anomaly is a cyst, sinus, or fistula (Figure - 1, 2, 3). A detailed knowledge of the embryology of these lesions is therefore necessary for both definitive diagnosis & proper therapeutic intervention.

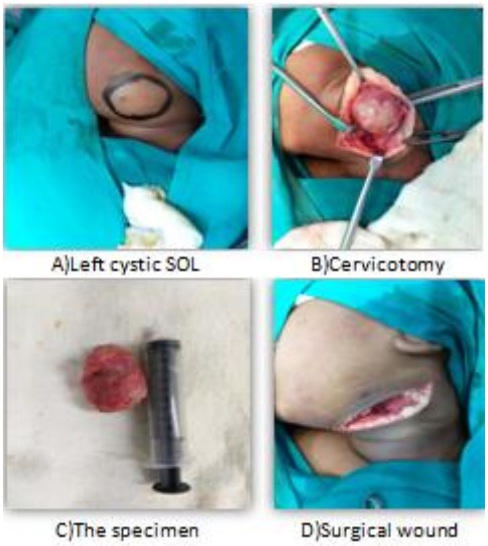

Figure 1: Surgical steps of second branchial cyst

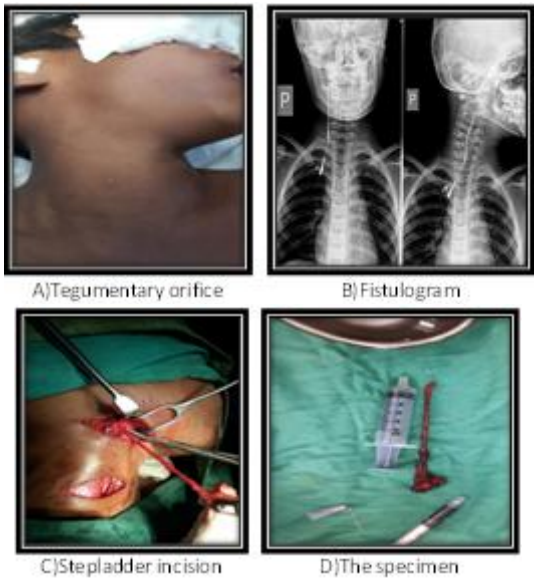

Figure 2: Surgical steps of second branchial sinus

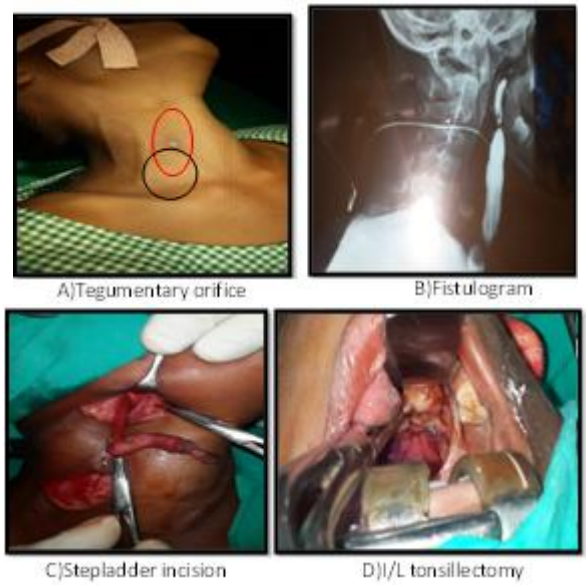

Figure 3: Surgical steps of branchial fistulae tract

2. Materials and Methods

We conducted this study in the Department of ENT of two state medical colleges of West Bengal, namely NRS Medical college, Kolkata and Burdwan Medical College, Burdwan. It comprises of 30 patients with second branchial cleft anomaly successfully managed in two years, between March2017 to February2019.

Thorough clinical history and careful examination was done in all the patients after admission.

Parameters assessed included not only age, sex, and side, but also the clinical data, surgical procedures and postoperative evaluation as well as the histopathological examination of the excised pieces.

3. Results

Thirty patients received treatment for second branchial cleft anomalies from March2017 to February2019. The majority of second branchial cleft anomaly patients presented with branchial cyst (18 patients/60%). Nine patients (30%) presented with branchial sinuses. Only three cases (10%) came with branchial fistula (Table-1).Second arch branchial fistulae are not so much rare.

Twenty (66.6%) of the 30 patients were right sided and 10 (33.3%) were left sided; (Table 2).

Fifteen (50%) of the 30 patients were women and 15 (50%) were men; (Table 3)

The age decades in which second branchial cleft anomalies most common that is first decade. In decreasing order of frequency, 0-10 years (18 patients, 60%), 11-20 (5 patients, 16.6%), and 21-30 (4patients, 13.3%) and 31-40 (3 patients, 10%); (Table 4).

Table 1: Clinical and paraclinical context in 30 patients as cyst, sinus and fistulae

Context	Number of cases	%
Second branchial arch cysts	18	60
Second branchial arch sinuses	09	30
Second branchial arch fistulae	03	10
Total	30	100

Table 2: Distribution of 30 cases with second branchial anomalies according to side involved

Side involved	Number of cases	%
Right side	20	66.6
Left side	10	33.3
Total	30	100

Table 3: Distribution of 30 cases with second branchial anomalies according to the gender

Gender	Number of cases	%
Women	15	50
Men	15	50
Total	30	100

Table 4: Age distribution of 30 second branchial cleft anomaly patients

Age	Number of cases	%
0-10	18	60
11-20	05	16.7
21-30	04	13.3
31-40	03	10
>40	00	00
Total	30	100

After excision, the specimens were sent for histological examination to establish the diagnosis in all the cases.

4. Discussions

Congenital abnormalities of the branchial apparatus can result in various abnormal conditions in theneck, including cyst, sinus or a fistula.

Bailey H[6] classified second branchial cleft cysts into four types. The type I cyst is the most superficial and lies along the anterior border of the sternocleidomastoid muscle, just deep to the platysma muscle. Type II cyst is the commonest and found in the “classic” location for these cysts: along the anterior surface of the sternocleidomastoid muscle, lateral to the carotid space, and posterior to the submandibular gland. The type III cyst extends medially betweenthe bifurcation of the internal and external carotid arteries to the lateral pharyngeal wall. The type IV cyst lies in the pharyngeal mucosal space and is lined with columnar epithelium.

Ninety-five percent of abnormalities of the branchial anomalies arise from the second cleft. At least 75% of all second branchial cleft abnormalities are cysts[7], which typically present when an individual is between 10 and 40-years-old. Second branchial cleft fistulas and sinuses are less common and usually present during the first decade of life[8,9]. No gender predilection has been reported[10].

In our study, 60% patient had branchial cysts, contradicting slightlywith the specialty literature data, that show a greater incidence of branchial cysts (75%) than branchial sinuses and fistulae, where fistulae is rare.

Telander R. L. et al[7] described that, most of the patients (75%) belonged to the second, third and fourth decade of live. But in our study most of the patients (60%) belonged to first decade of life.Branchial cleft anomaly was in the right side in 66.6% patients in our study. The rest of the results we obtained are similar to those in the literature:as there was no gender proclivity.

A careful history and complete physical examination searching for associated systemic congenital anomalies is essential. There may be other craniofacial abnormalitiesor branchio-oto-renal (Melnick-Fraser) syndrome. We have found a case of Melnick- Fraser syndrome.

Generally ultrasonography and fistulgram are done to ascertain the extent of lesion. Second arch branchial cysts have variable sonographic appearances, which may be confused by the inexperienced radiologist. CT scan and MRI are very helpful to demonstrate the anatomical extensions of branchialanomalies. The histopathological examination establishes final diagnosis.

Management of second branchial cleft anomalies is surgical excision[11] under general anaesthesia, and we have followed it in every cases.

An early surgical excision is recommended because of the high incidence of secondary infection. Few patient presented with acute infection on the lesion. Proper antibiotic therapy, with incision and drainage of any abscess were done to control infection. Definitive surgical excision was delayed till the inflammation subsided.

5. Conclusions

Branchial cysts should always be considered in the differential diagnosis of swellings in the lateral part of the neck that may be painful or painless. Most of the patients presented with cystic lesion.

Second branchial anomalies are frequently diagnosed in persons belonging to the first and second decades of life in our study. There is equal incidence in both male and female.

The definite treatment for second branchial anomalies is a complete surgical excision of the lesion.

Correct and complete surgical excision will not allow a recurrence of the branchialanomaly.

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