Left complete second branchial arch fistula in a 9 years old boy
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Abstract

Anomaly of 2nd arch is the commonest among branchial arches anomalies and manifests as branchial sinus in majority of cases while branchial fistula is seldom to occur. We present a case of left branchial fistula in a 9 years old boy, which was confirmed by a fistulogram. The tract was completely excised by combined surgical approach with excellent outcome.

Keywords: Arch, branchial, cleft, complete branchial fistula, fistula, sinus, Anbar

Introduction

It is necessary to understand the embryology and anatomy of the cervical region in order to discuss the abnormalities of branchial apparatus [1]. During the 2nd to the 6th weeks of the intrauterine life, the branchial apparatus develops in the central part of the neck from an arches of a hollow tube. Branchial arches develop into the muscles, bones and vascular structures of the head and neck.

The inner thinner parts between the arches called pouches, while the thicker external parts between arches are known as clefts. The structures of the middle ear, palatine tonsils, thymus and parathyroid glands are developed from branchial pouches. The external ear canal develops from the first branchial cleft. The 2nd to 4th branchial clefts unite to form the sinus of His, which will normally have degenerated. When the branchial cleft is not accurately degenerated, a branchial cleft cyst occurs.

If both branchial cleft and pouch are not degenerated, a fistula happens between the skin and the pharynx. Branchial clefts anomalies can be presented into 4 closely related diseases, cysts, external sinuses, internal sinuses, and complete fistulas. The abnormalities of the 2nd branchial cleft forms 95% of all branchial abnormalities, which mostly found along the anterior border of the upper 1/3rd of the sternocleidomastoid muscle. The lowest incidence among them is the complete branchial fistula with very few cases are reported in previous literature [2, 3].

We report a rare case of complete 2nd branchial arch fistula in a 9-year-old boy, which was treated surgically.

Case Report

A 9-year-old boy presented with recurrent mucopurulent discharge from an opening in the left anterior triangle of neck along the
anterior border of the sternocleidomastoid, on and off since 4 years of age. The discharge only occurs with eating or drinking. The child gave a history of multiple attacks of tender swelling at the site of the opening and fever which responds well to aspiration of the swelling under coverage of antibiotic. Physical examination shows tinny sized opening at the anterior border of the junction of lower and middle third of left sternocleidomastoid Fig.1. Mucoid discharge comes through the opening when the child attempt to drink water. Clinically the condition was diagnosed as branchial fistula. Preoperative pharyngoscopy was performed and looks normal. A fistulogram was done by injecting a gastrografin into the external opening, which established the diagnosis of 2nd branchial arch fistula through the observation of the internal opening in the left supratonsillar fossa Fig. 2.

The treatment of a child surgically was decided in ante Trendelenburg position under general anaesthesia. An elliptical flap including the opening was incised. Elevation of the flap was raised in subplatysmal plane. A polyethylene tube was inserted into the external opening as a guide to the dissection of the fistulous tract. The fistulous tract was dissected along the carotid sheath, then it turns medially between the external and internal carotid arteries. Left tonsillectomy was performed by cold snare technique. The tract was excised and removed through the mouth. The excised specimen was shown in Fig. 3. Closure of the wound was done in layers without drain. Postoperative recovery of the child was smooth. No recurrence was occurred in the period of three years’ postoperative follow-up.

Discussion

Anomalies of the branchial arches account around 20% of the congenital head and neck diseases in children [4]. The vast majority (95%) of these anomalies affects the second branchial arches. Fistula or sinus of the second branchial arch resulting from failure of branchial arch tract to obliterate. The second arch branchial fistula usually presented in the first two decades of life. Females are slightly affected more than
The patient usually suffers from recurrent mucopurulent discharge from an external opening in the anterior triangle of the neck along the anterior border of the sternocleidomastoid between its middle and lower thirds. Despite bilateral branchial fistulas have been reported in literature, fistulas on the right side are most commonly seen [2, 5].

Injecting gastrograffin fistulogram is an important preoperative tool in confirmation of the diagnosis of branchial fistula. Fistulogram can delineate the fistula tract up to internal opening in palatine tonsil. Also fistulogram can avoid the need for another imaging tools [6]. Histologically, the fistula tract mostly shows ciliated pseudostratified columnar epithelium with submucosal lymphatic tissue. Although squamous cell lining, mixed cell lining, and branchiogenic carcinoma have also been reported but its occurrence is extremely rare [7].

Branchial sinus or fistula should be differentiated from tuberculosis sinus. The best option for the treatment of branchial fistula is complete excision of the fistulous tract. Tow surgical approaches were used: the stripping and stepladder methods [8]. Although tow incisions are used in stepladder method but it gives good exposure with minimum tissue dissection. In order to avoid recurrence, the whole fistulous tract must be excised with its internal opening [9]. The recurrence rate of 3% has been documented in literature with external approach only, because of incomplete excision of the internal opening in the tonsil [6]. So it's essential to approach branchial fistula internally and externally with the aid of a probe inside the fistula tract in order to prevent the recurrence of a fistula [10]. No recurrences have been reported with this surgical combined method.

In infants with uncomplicated branchial fistula surgical treatment can be postponed till 3 years of age. Also surgery is postponed in case of an infective episode of the fistula, in such case treatment with antibiotic is an essential step before surgery. In a recent study from Chinese, endoscopic approach was used for treatment of second branchial fistula in 9 patients without recurrence in all patients after 6 months of follow-up. Endoscopic approach is easy, minimally invasive, simple and can achieve complete excision of the fistulous tract [11].

In conclusion, we presented a case of 2nd branchial arch fistula in a 9-year-old boy which was confirmed by fistula gram. Complete surgical excision of the fistula was performed with free symptoms during the three years’ postoperative follow-up.

Competing interests

The authors declare that there is no conflict of interest.

Author Contributions

All authors wrote, read and approved the final manuscript.

References