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Complete Branchial Fistula

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Complete branchial fistula with internal and external opening is rare. We are reporting a case of complete branchial fistula in a ten year old child. We excised the complete branchial fistula by using combined (transcervical and transoral) approach under general anaesthesia.

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Although the branchial apparatus was first described by VonBaer, anomalies in its development were credited by von Ascheron[1]. Branchial arches and their corresponding pouches develop from mesodermal condensations in the side wall of the embryonic pharynx. Branchial fistulas are uncommon anomalies of embryonic development of branchial apparatus. Second branchial arch and pouch anomalies are common anomalies of branchial apparatus[2]. During embryonic development, the second arch grows caudally, envelop the third, fourth and sixth arches and form the cervical sinus by fusing with the skin caudal to these arches. The edges of cervical sinus fuse and the ectoderm within the fused tube disappears. Persistence of ectoderm gives rise to branchial cyst. The branchial fistula results from the breakdown of the endoderm, usually in the second pouch. A persistent fistula of the second branchial cleft and pouch pass from the external opening in the mid or lower neck in the line of the anterior border of the sternocleidomastoid muscle, deep to platysma along the carotid sheath, then pass medially deep between the internal and external carotid arteries after crossing over the glossopharyngeal nerve and hypoglossal nerve. Finally, it opens internally in the tonsillar fossa usually on the anterior face of the upper half of the posterior pillar of the fauces or in the intratonsillar cleft[3]. Most of times it is a simple sinus opening, that extends up the neck for a variable distance. Complete branchial fistula with internal opening into tonsillar region is rare[2]. Although branchial fistulas may occur in any age group, commonly patients present to clinicain in first and second decades of life[4]. These patients commonly present with persistent mucoid discharge from a fistula opening or infection in the lower part of neck with mucopurulent discharge[2]. The completeness of fistula can be diagnosed by a dye test or fistulogram and sometimes negative preoperative test might become positive under general anaesthesia because of muscle relaxation[3]. Occasionally the fistula tract may be blocked by thick secretions or granulation tissue[4].

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THE CASE

Ten years old male patient complained of mucopurulent discharge from an opening in left lower part of neck for one year. Patient's parents noticed an opening in lower part of left side of the neck since he was 2 years old. He was asymptomatic till one year ago. The patient noticed mucopurulent discharge from the opening with common cold. The discharge was moderate in quantity, not foul smelling. It subsided with antibiotics within 5 days. Patient had two more attacks of discharge from the opening during one year period and responded well to medical treatment. For last 3 months, there was no discharge from the opening. On physical examination, there was small punctum in the skin at the junction of anterior two third and lower one third of anterior border of left sternocleidomastoid muscle. There are no similar openings or any other congenital anomalies on the right side. Full blood count and urine examination was normal.

The patient underwent excision of branchial fistula tract using transcervical approach and transoral approach under general anaesthesia. Elliptical incision was made around the opening of the fistula. The fistula was cannulated with blind tip probe. The tract was dissected superiorly in subplatysmal plane along the carotid sheath up to the level of carotid bifurcation. Around 1.5 to 2 cm upper incision was made at the level of the carotid bifurcation. The tract was separated from the surrounding soft tissues superiorly beneath the stylohyoid muscle and digastric muscle. The tract was going medially in the parapharyngeal space towards the tonsillar fossa between the internal carotid artery and external carotid artery after crossing the loop of hypoglossal nerve.

Using the Boyle-Davis mouth gag, the probe was palpated near the lower pole of the tonsil in the tonsillar fossa. Tonsillectomy was done. Dissection was done around the fistula tract in the tonsillar fossa and parapharyngeal space. Complete fistula tract was pulled with the probe through the neck. Tonsillar fossa opening was closed with 3-0 vicryl. Haemostasis was secured. External skin incisions were closed with 3-0 catgut and 4-0 nylon. The length of the fistula tract was around 9 cm from the skin opening to the lower pole of the tonsil (Fig.1). The post-operative course was uneventful. Antibiotics, analgesics and mouth gargles with betadine and H_2O_2 (1:40 dilution) were given for 7 days. Histopathological examination showed branchial fistula tract lined with pseudostratified columnar epithelium. At 3 months follow up, the patient was asymptomatic.

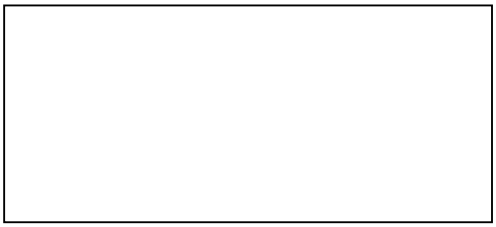

Figure 1. Showing the branchial fistula tract with tonsil

DISCUSSION

The treatment of choice for branchial fistula is surgical excision. Preoperatively, the patient should be examined for bilateral lesion and any other congenital anomaly. Surgery may be delayed in an infant with uncomplicated branchial fistula till the age of three years. If there is an infective episode, it must be allowed to subside with antibiotic treatment before surgery takes place. Imaging is of little benefit. Computed tomography scanning and magnetic resonance imaging of the neck are useful mainly in delineating the relationship of surrounding neurovascular structures to the lesion[4].

Several surgical approaches have been described for the management of a branchial fistula[1-5]. Stepladder approach with two incisions in the neck gives exposure of the fistula tract with less tissue dissection. Higher incision should be bigger than the lower one because the fistula tract is deeper in location in the vicinity of important neurovascular structures[3]. Complete excision of the fistula is never sure with external approach only. The reported incidence of recurrence rate was three percent after external approach[2] only and most probably this is due to incomplete excision of the fistula tract in the parapharyngeal space. In complete branchial fistula with a probe passing to the tonsillar region, the above procedure should be combined with oral route. Through oral route, we can identify the internal opening after tonsillectomy, separate the fistula tract from surrounding soft tissues and muscle fibres in parapharyngeal space by precise dissection around the fistula tract. Sometimes it is possible to dissect the tract with the tonsil and remove them as one specimen[1]. Till now with combined transcervical and transoral approach, there is no recurrence reported in the English literature.

CONCLUSION

Complete branchial fistula arising from second branchial arch is rare. It is not possible to excise the complete branchial fistula totally with transcervical approach only. This is a case of complete branchial fistula, which was managed through combined approach using transcervical route and transoral route. Complete branchial fistulas are better managed by otolaryngologists who are capable of performing the combined approach.

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