

# Complete Fistula of the second Branchial cleft: Report of a case with discussion on investigation and treatment aspects.

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## Abstract

**Objective:** This is the report of a case of complete second branchial cleft fistula. The main objective of this report is to highlight the use of fistulogram for the diagnosis and to suggest the use of rigid guide wire like the tonsil snare wire for the excision. **Case report:** A 12-year-old girl who presented with an intermittent mucoid discharge from the external opening in the neck on the right side was diagnosed to have a second branchial cleft fistula. A preoperative fistulogram revealed the tract up to the tonsillar fossa. Complete excision of the tract was done by a two step neck incision using tonsillar snare wire as the guide. **Conclusion:** Though second branchial fistulae are common, complete fistulae are rare and this merits the publication of this report. The report also stresses on the need to perform a preoperative fistulogram and the advantage of using the tonsil snare wire for excision.

## INTRODUCTION

Congenital cervical cysts, sinuses, and fistulae must be considered in the diagnosis of head and neck masses in children and adults. Anomalies of the second branchial cleft account for 90% of the developmental abnormalities of the branchial apparatus. Majority of these have an external opening in the neck along the anterior border of sternomastoid at the junction of upper 2/3<sup>rd</sup> with lower 1/3<sup>rd</sup>. The internal opening may not always extend up to the posterior pillar of the tonsil as described in the literature. This is the report of a case of complete second branchial cleft fistula which was excised using tonsillar snare wire as the guide.

## CASE REPORT

A 12-year-old Indian female patient presented to the ENT outpatient with the history of a small opening in the lower part of the neck on the right side since birth and intermittent, yellowish white discharge from the opening. On examination, a small opening was seen on the right side of the neck along the anterior border of the sternomastoid at the junction of lower 1/3<sup>rd</sup> with upper 2/3<sup>rd</sup> with scanty mucous discharge on pressure. [Fig No. 1]

## Figure 1

Figure No 1: Pre operative photograph showing the external opening of the fistula



Naked eye examination of the oropharynx did not reveal any visible opening at the posterior tonsillar pillar. On the basis of clinical examination, she was diagnosed to have a second branchial cleft fistula. A fistulogram showed the tract extending from the opening in the neck until the tonsillar region; with minimal overflow on to the oropharynx. [Fig No. 2]

**Figure 2**

Figure No 2: Fistulogram showing the complete tract of the fistula



After necessary investigations to confirm the surgical fitness, excision of the tract was carried out under general anaesthesia. A tonsillar snare wire was passed through the neck opening upwards along the tract. The tract was made free from its attachments and dissected upwards keeping the snare wire as guide. A second incision was taken in the upper part of the neck at the level of the hyoid bone over the anterior border of the sternomastoid and the tract was delivered upwards through the incision and the dissection was carried out further towards the tonsillar fossa. Complete excision was possible by gentle traction on the tract and the cord like tract could be followed up to the tonsillar fossa. The tract was ligated at the point of its entry into the tonsillar fossa. The excised tract measured 7 cm in length. [Fig No. 3] It was found to lie over the carotid sheath and was not going between the internal and external carotid arteries as described in the literature.

**Figure 3**

Figure No 3: Excised specimen with snare wire



Histopathological examination confirmed the keratinized squamous epithelial lining of the tract with clusters of mucous secreting glands at places. No recurrence of symptoms is seen after 12 months of follow-up.

## DISCUSSION

Anomalies of the second branchial cleft account for 90% of the developmental abnormalities of the branchial apparatus.<sup>1,2</sup> However, complete second arch fistulae are rare and comprise 2% of all branchial anomalies. The fistula is more commonly seen in males (60%) and can range from 1 to 8 cm in length.<sup>3</sup> It can present at any age, more commonly in the first and second decade of life. Two to ten percent (2-10%) of them can be bilateral. When unilateral, 70% of them occur on the right side. 39% are complete fistulae, 50% are external draining sinuses and 11% have internal opening alone.<sup>3</sup> 35% of the patients with complete fistula can have a family history of branchial anomalies.<sup>3</sup> Branchial cysts are more common (80.8%) than branchial fistulae.<sup>4</sup>

Anatomically, a typical second cleft fistula has its external opening at the anterior border of sternomastoid at the junction of middle and lower 1/3<sup>rd</sup>. Second arch anomalies are classified into four types. Type I lesions lie anterior to the sternocleidomastoid muscle (SCM) and do not come in contact with the carotid sheath. Type II lesions are the most common and pass deep to the SCM and either anterior or posterior to the carotid sheath. Type III lesions pass between the internal and external carotid arteries and are adjacent to the pharynx. Type IV lesions lie medial to the carotid sheath close to the pharynx adjacent to the tonsillar fossa.<sup>5</sup> Our case had the type II pattern. In the upper part, the tract may end in the upper half of the posterior tonsillar pillar, the supratonsillar fossa or directly onto the tonsillar surface.<sup>3</sup>

The fistulae are almost always present at birth with a small pinpoint external opening which may go unnoticed. Some patients may also have conductive or sensory neural deafness as well as other anomalies of the first and second arch derivatives.<sup>3</sup>

Symptoms consist of intermittent or continuous mucous discharge and recurrent attacks of inflammation following an attack of upper respiratory tract infection. Frank cellulitis or abscess formation may occur requiring an incision and drainage. The external opening may be seen to move upwards with deglutition. Probing the tract may sometimes produce symptoms of cough, palpitation, pallor and vomiting because of the tract's proximity to the vagus nerve.<sup>3</sup> Pathologically, the fistula lining consists of squamous epithelium.

A fistulogram may be obtained to confirm the clinical diagnosis and is useful to show the length and the location of the tract and possible presence of associated cyst.<sup>3</sup>

Radiographs reveal a smoothly marginated tract of variable width following the anatomical path as described earlier. In contrast, the walls of a tuberculous fistula are very irregular.<sup>3</sup> According to another study; a routine preoperative fistulogram may not be required in all cases.<sup>4</sup>

Surgery is usually not indicated if the fistula is asymptomatic. However, most are symptomatic and the surgical excision is carried out to avoid the risk of recurrent infection and for cosmetic reasons. Sclerosing agents are seldom used today due to the associated inflammatory reaction and the risk of necrosis with perforation into the pharynx.<sup>1</sup>

Incisions for the excision could be hockey stick type<sup>6</sup> or step ladder incision (Bailey). A similar technique involving two separate transverse incisions is now recommended for the removal of the branchial fistulae.<sup>1</sup> Another variation, pull through branchial fistulectomy has been described by Talaat in 1992.<sup>1</sup> In this technique, the infrahyoid portion of the fistula is dissected through one or two (stepped) neck incisions. Dissection of the Para pharyngeal segment is done via the mouth, and is continued to the level of the hyoid bone. Tonsillectomy is then performed; after which the fistula is withdrawn through the mouth. The stripping

method was described by Taylor and Bicknell in 1977. But, this has not been widely used due to the greater risk of damage to the adjacent structures.<sup>3</sup>

Complications of the surgery include recurrence, which could be 3% in fresh cases to up to 20% in second surgical attempts. Other complications include secondary infection, injury to facial, hypoglossal, glossopharyngeal, spinal accessory nerves, injury to internal jugular vein, bad scar and hematoma formation.<sup>6</sup>

## KEY POINTS

This is the report of a common congenital anomaly of the branchial apparatus.

The points which make this worth reporting are

- The presence of a complete tract,
- Demonstration of the complete tract using fistulogram
- The use of tonsillar snare wire as a guide during the surgery which facilitated gentle traction on the tract
- Complete excision could be done without the need of tonsillectomy and without any damage to the surrounding structures.

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