

**Case report:**

**Endoscopic Chemocauterization Of Congenital Piriform Fossa Sinus Tract In Children**

*Ali AH<sup>1</sup>, Ismail H<sup>2</sup>, Hamid SAA<sup>3</sup>*

**Keyword:** piriform fossa; piriform sinus; branchial cleft; chemical; cautery

*Bangladesh Journal of Medical Science Vol. 17 No. 03 July'18. Page : 507-510  
DOI: <http://dx.doi.org/10.3329/bjms.v17i3.37010>*

**Introduction**

At the fourth week of gestation, the branchial apparatus which consist of 6 pairs of arches, clefts and pouches are formed. Externally, the cleft is lined by ectoderm and internally the pouches is lined by endoderm with mesoderm in between.<sup>1</sup>

Abnormal development of the branchial apparatus will result in the formation of the fistulae, sinuses and lateral cervical cyst. Branchial cyst will retain secretion due to no visceral or external opening. On the other hand, branchial sinuses will communicate either with the pharyngeal lumen or the skin and brachial fistulas will form tract connecting the skin and pharynx.<sup>2</sup>

There are only about 1-4% incidence of fourth branchial anomaly reported in the literature, which carries about less than 100 cases of all branchial arch anomalies. The fourth branchial arch anomalies usually presented with acute suppurative thyroiditis (45%) and recurrent neck abscess (42%) with the left side predominant (94%).<sup>2</sup>

The left sided predominance is probably due to its more complex and extended pathway of the fourth branchial arch tract as compared to the right side. It might also due to absence or involution of the ultimobranchial body on the right side.<sup>2</sup>

We present a case of congenital piriform fossa sinus tract that was managed by endoscopic

chemocauterization using silver nitrite 20% and trichloroacetone 20% solution.

**Case report**

An eight years old boy was referred to our clinic for persistant anterior neck discharge since four years ago. The discharge was serous in nature and was unrelated to feeding. Otherwise there was no thyroid symptoms.

Further history revealed that he had painful neck swelling at the age of two and three years old and incision and drainage was done for both episodes. Subsequently patient had persistant discharge from the sinus opening at the previous incision site.

On examination, there was a sinus opening at the anterolateral part of neck at the thyroid level (Figure 1). The other ENT examination was unremarkable.

CT scan fistulogram was done by injecting the contrast through the cannulated sinus from the neck. The result showed that there was fistula track connecting from the opening at the neck through the left piriform fossa (Figure 2).

The opening of the sinus was confirmed by direct laryngoscopy and proceeded with endoscopic chemocauterization. The piriform fossa sinus tract was initially cannulated with branula size 24 gauge (Figure 3), followed by a branula size 20 gauge attached to Storz injection canula (Figure 4). Silver nitrate 20% solution injected into the fistula and the

1. Ahmad Hafiz Ali, Department of Otorhinolaryngology-Head & Neck Surgery, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kota Bharu, Kelantan.
2. Hashimah Ismail, Department of Otorhinolaryngology-Head & Neck Surgery, Hospital Raja Perempuan Zainab II, 15000 Kota Bharu, Kelantan, Malaysia.
3. Suzina Shiekh Ab Hamid Department of Otorhinolaryngology-Head & Neck Surgery, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kota Bharu, Kelantan.

**Correspondence to:** Ahmad Hafiz Ali, Department of Otorhinolaryngology-Head & Neck Surgery, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia. Email: [matkurt@gmail.com](mailto:matkurt@gmail.com)

injection was discontinued when the leakage of the solution was seen. The cricopharyngeus was packed with ribbon gauze prior to the procedure to prevent the mucosal injury caused by excessive silver nitrite leakage.

During follow up, the discharge from the sinus had reduced. Examination under anaesthesia one month after the first chemocauterization of the fistula, however the piriform fossa sinus tract was still patent. We proceeded with cannulation of the fistula, however Trichloroacetone 20% solution was then used.

During the subsequent follow up, there was no discharge noted from the fistula opening over the neck. Examination under general anaesthesia revealed that the sinus over the piriform fossa was completely obliterated with normal overlying mucosa (Figure 5).

### **Discussion**

A branchial pouch anomaly is embryologically defined by its origin and clinically categorized by the site of its internal opening<sup>3</sup>. There is confusion in determining the diagnosis of third and fourth pouch anomalies as they both arise in the piriform sinus. After it was first described by Tucker<sup>4</sup>, there were few other fourth branchial pouch origin sinus were reported<sup>5-6</sup>. The term "piriform sinus fistula" was used because of the undiscriminated origin between third and fourth branchial pouch and also it was clinically worthless to differentiate the origin. The fistula usually originates from the apex of the piriform sinus, penetrates the cricopharynx or cricothyroid muscles, runs anteroinferiorly, and then ends next to or enters a lobe of the thyroid<sup>7</sup>.

Piriform sinus fistula has been reported virtually always occur on the left side of the neck in over 90% of cases and often presents with repeated neck swelling, suppurative thyroiditis, or on rare occasion, deep neck infection<sup>2</sup>. However, our patient presented with persistent discharge from the previous incision and drainage scar. It was never been reported in any literature and yet it still possible that the previous neck abscess was the infected piriform sinus tract.

In the early days, barium swallow was the main diagnostic tool<sup>8</sup> as an effective means of demonstrating the presence of an anomalous tract originating from the left piriform sinus. However, with the availability of CT scan and MRI, the diagnosis of piriform sinus tract has been much more improved in which the path can be delineated<sup>7</sup>.

In the recently published systematic review by Lachance and Chadha<sup>9</sup>, electrocautery was the

most commonly used technique for obliterating the piriform fossa sinus tract, used in 46.4% of the identified cases. Other techniques were laser, 22.6%; trichloroacetic acid 22.6%; silver nitrate, 4.8%, combination of silver nitrate and laser 2.4% and fibrin glue 1.2%. The study also showed that silver nitrite used alone is 100% successfully, meaning its a very successful procedure as compared to others. However, limited patient were included in the study. In our case, after the diagnosis was confirmed by the means of direct laryngoscopy, the piriform fossa sinus tract was cauterized using silver nitrite 20%. A repeat procedure was done, however, trichloroacetone 20% solution was used this time. It was the first ever case that use combination of both silver nitrite and trichloroacetone solution. Previous study only used the combination of CO<sup>2</sup> laser and silver nitrite solution and only 77.8% successful rate with single procedure. The rest of the case need revision procedure and had 100% obliteration after second operation. No complication was observed from the trichloroacetic acid cauterization in which it caused temporary vocal cord immobility that occurred in about 2.4% of the cases<sup>9</sup>.

### **Conclusion**

Piriform fossa sinus tract should be suspected if children presented with recurrent neck abscess as it is quite common disease than previously believed. Endoscopic chemocauterization of congenital piriform fissa sinus tract is seems to be more feasible and minimally invasive without any known complication so far. However, more study should be conducted in the future.



Figure 1: Sinus opening at the previous incision and drainage scar.

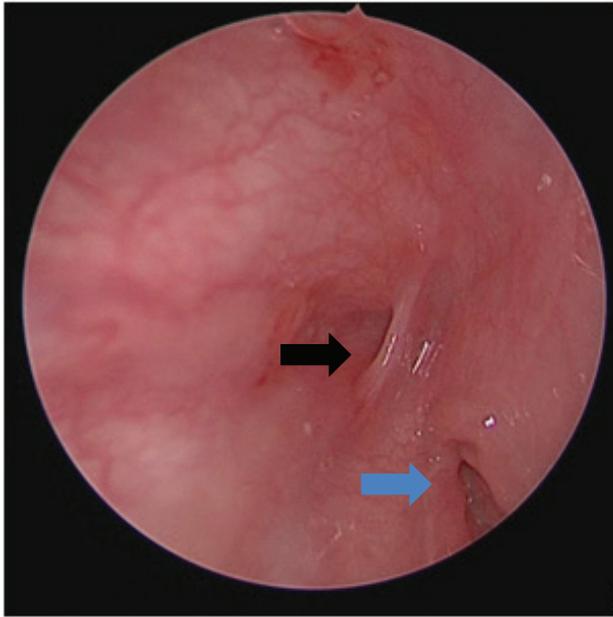


Figure 2 : The piriform fossa sinus tract (black arrow) and cricopharyngeus (blue arrow).

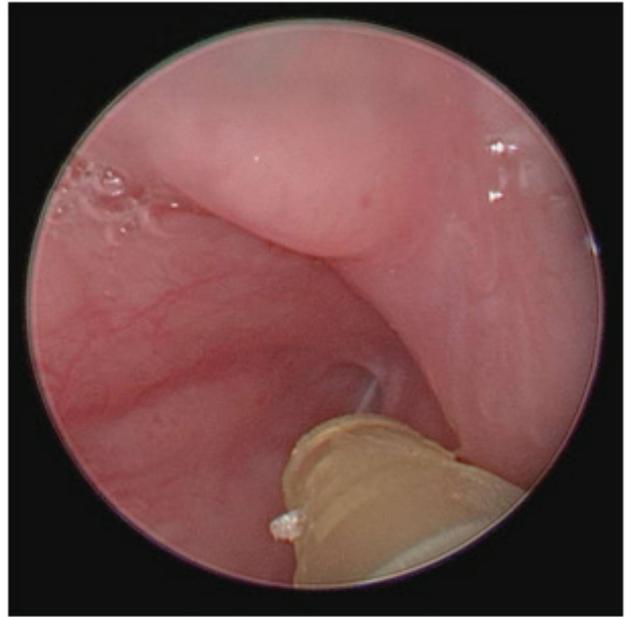


Figure 3: Branula size 24 gauge was used to cannulate the piriform fossa sinus tract.



Figure 4: A modified canula with branula size 24 gauge attached to the storz's injection canula.

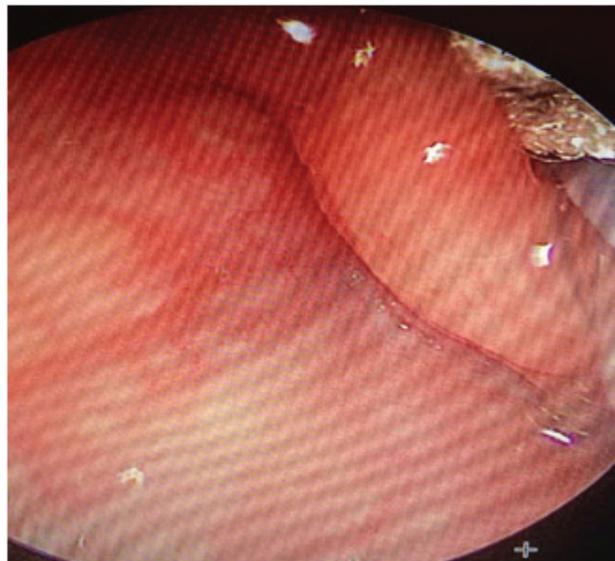


Figure 5: Complete obliteration of piriform fossa sinus tract

**References**

1. Shrime M, Kacker A, Bent J, Ward RF. Fourth branchial complex anomalies: a case series. *Int J Pediatr Otorhinolaryngol.* 2003;**67**:1227-33.
  2. Nicoucar K, Giger R, Jaecklin T, Pope HG, Dulguerov P. Management of congenital third branchial arch anomalies: a systematic review. *Otolaryngol Head Neck Surg.* 2010;**142**:21-8.
  3. Liston SL. Fourth branchial fistula. *Otolaryngol Head Neck Surg.* 1981;**89**:520-2.
  4. Tucker HM, Skolnick ML. Fourth branchial cleft (pharyngeal pouch) remnant. *Trans Am Acad Ophthalmol Otolaryngol.* 1973;**77**:ORL368-71.
  5. Rosenfeld RM, Biller HF. Fourth branchial pouch sinus: diagnosis and treatment. *Otolaryngol Head Neck Surg.* 1991;**105**:44-50.
  6. Jordan JA, Graves JE, Manning SC, McClay JE, Biavati MJ. Endoscopic cauterization for treatment of fourth branchial cleft sinuses. *Arch Otolaryngol Head Neck Surg.* 1998;**124**:1021-4.
  7. Ford GR, Balakrishnan A, Evans JN, Bailey CM. Branchial cleft and pouch anomalies. *J Laryngol Otol.* 1992;**106**:137-43.
  8. Cha W, Cho SW, Hah JH, Kwon TK, Sung MW, Kim KH. Chemocauterization of the internal opening with trichloroacetic acid as first-line treatment for pyriform sinus fistula. *Head Neck.* 2013;**35**:431-5.
  9. Lachance S, Chadha NK. Systematic Review of Endoscopic Obliteration Techniques for Managing Congenital Piriform Fossa Sinus Tracts in Children. *Otolaryngol Head Neck Surg.* 2015;**154**:241-6.
-