

## Research Article

**Endoscopic Diathermy Cauterization of Piriform Fossa Sinus Tract (PFST)**Dissanayake DMAH<sup>1</sup>, Yasawardene ADKSN<sup>2</sup>, Kirihena RA<sup>2</sup><sup>1</sup> Registrar in ENT, Lady Ridgway Children's Hospital (LRH), Sri Lanka<sup>2</sup> Consultant ENT and Head & Neck Surgeon, Lady Ridgway Children's Hospital (LRH), Sri Lanka**Abstract**

## Introduction

A congenital piriform fossa sinus tract is thought to be caused by a developmental abnormality of the third or fourth pharyngeal arches. This condition is traditionally managed by an open approach, external excision of sinus tract with hemi-thyroidectomy. However, endoscopic cauterization of PFST is now recognized as a minimally invasive definitive first line therapeutic option.

## Objective

To evaluate the success of endoscopic cauterization of the PFST as a definitive first line therapeutic option.

## Method

Retrospective analysis was done on medical records of ten patients (aged 1-12y), who were diagnosed with PFST and underwent endoscopic diathermy cauterization of PFST during one-year period (2015/2016) at LRH. Data including demography, presentation, management and response to treatment were analyzed.

## Results

Median age of our case series was 8.23 years and eight out of ten patients (80%) were males. The most common presentation was recurrent thyroid abscess 60% (6/10) and the side of the disease was left in 90% (9/10). Eight out of ten (80%) patients had complete closure of the PFST after one session of endoscopic diathermy cauterization. Two out of ten (20%) patients had to undergo two sessions. Average follow up period was 17 months.

## Conclusion

We propose the endoscopic diathermy cauterization as a safe and definitive first line therapeutic option in the management of the PFST.

**Key words:** Piriform Fossa Sinus Tract (PFST), Recurrent Neck Abscesses, Endoscopic Diathermy Cauterization, Suppurative Thyroiditis

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## **Introduction**

A congenital piriform fossa sinus tract causes recurrent neck abscess specially in children. Diagnosis of this congenital sinuses are often delayed <sup>[1, 2]</sup> and most patients have undergone several sessions of incision and drainage at the time of diagnosis. <sup>[1,2,3]</sup> Reasons for the delay may be the rarity of the anomaly and the non-use of appropriate investigations. Therefore, a high degree of clinical suspicion and better investigations to detect the lesion without delay is essential.

Embryological basis for piriform-fossa sinus tracts is controversial.<sup>[1,4]</sup> One school of thought is that these are due to third or fourth branchial arch anomalies. However, according to recent literature, surgical explorations and tracing of the tracts and imaging data show that they do not follow the theoretical pathway of third or fourth arch anomalies.<sup>[1,4,5]</sup> Some recently published literature <sup>[1,4]</sup> propose that these are due to a third pouch derivative named as thymopharyngeal duct. According to them, the thymopharyngeal duct is the descending pathway of the thymus from the primitive pharynx to the neck. Failure in involution of this pathway during the embryological development causes the piriform fossa sinus tract. This sinus tract gets infected often following upper respiratory tract infection and commonly presents with an inflammation of the neck.<sup>[4,6]</sup>

Traditional management of this anomaly is complete excision of the tract with hemithyroidectomy. Most of the patients have undergone several procedures at the time of diagnosis <sup>[2,5]</sup> and open surgery is difficult with the risk of recurrent laryngeal nerve damage. Complications of this procedure are more common in children less than eight years of age.<sup>[6]</sup> Another option in the management of this disease is endoscopic diathermy cauterization of the sinus opening. According to the literature, there are several methods of obliteration the PFST.<sup>[7]</sup> They are electrocauterization, laser cauterization and chemical cauterization (Trichloro Acetic Acid/ Silver Nitrate/ Fibrin glue).

We used rigid video pharyngoscopy in all suspected patients to detect the presence of PFST. If the sinus is found, cauterization is also attempted at the same time with a monopolar diathermy. We wanted to assess the efficacy and the safety of our current practice.

## **Method**

Retrospective analysis of medical records of ten patients who were diagnosed with piriform fossa sinus tract (PFST) and underwent endoscopic monopolar diathermy cauterization during a one-year period (2015/2016), at Lady Ridgway Hospital (LRH) for children was done. Ethical approval was obtained from the local ethical review committee of LRH.

All patients who underwent endoscopic diathermy cauterization during this period were included in the study. Data including demography, clinical presentation, management, and response to treatment were collected using a data collecting sheet.

Follow up details were obtained from clinic records, patient interviewing during clinic visits telephone conversations.

### **Procedure - Rigid Video Pharyngoscopy**

A rigid video pharyngoscopy procedure is done under general anesthesia with patient in the supine position. The examiner stays at the head end of the patient and the video screen is placed at the foot end of the patient. A straight blade laryngoscope is placed and the 30 degree Hopkins rod telescope to which a camera is attached is used to obtain the magnified view of the piriform fossa. (Fig 1) If a sinus pit is located cauterization is done using an insulated monopolar diathermy probe at the same time. (Fig 2) An operating microscope is sometimes used to obtain a better view during diathermy cauterization. Extra care is taken during the use of monopolar diathermy to minimize the lateral damage.

Most of our patients were discharged in the following day morning after the procedure. Patients with active neck infection were treated with intravenous antibiotics and were kept in the ward for three to four days. Endoscopic examination was repeated in six to eight weeks in all patients.

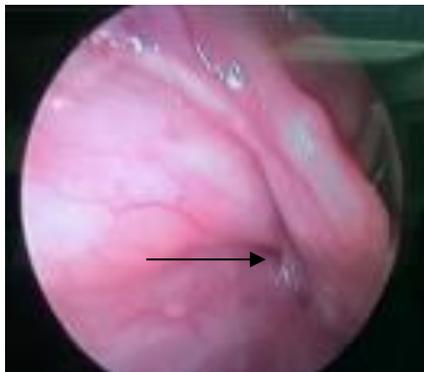


Fig 1 - Diagnostic rigid video endoscopy view (04mm, 30 degree Hopkins rod endoscope) of a left piriform fossa sinus of case number 8 (T1). The arrow head shows the sinus pit.



Fig 2 - Endoscopic (04mm, 30 degree Hopkins rod endoscope) view of cauterization of the left PFST of case number 8(T1) using an insulated monopolar diathermy probe.

## Results

There were ten patients (08 males, 80%) who were in the ages between 1.58 to 12 years. Nine out of ten (90%) patients had left side recurrent neck infection and one patient (10%) had infection at the right side of the neck. All patients had recurrent neck infections at presentation and 6/10 (60%) had abscesses related to the thyroid gland detected on ultrasound scan. (T1) None of the ten patients had undergone endoscopic examination of pharynx prior to the presentation at our institute.

Sinus openings of eight out of ten (80 %) patients appeared completely closed after the first cauterization. Two patients had demonstrable sinus opening at second pharyngoscopy without neck infection and their sinus opening was completely closed after the second cauterization. There were no procedure related complications. Furthermore, there were no recurrence up to now and the average follow-up period was 17 months. T2

## Tables

**Table 1 (T1) Summary of the cases to show demography and presentation**

Case No	Age (years)	Sex	Presentation	Side Of PFST
01	3.25	Male	Recurrent thyroid abscess	Left
02	12	Male	Recurrent thyroid abscess	Left
03	10	Female	Recurrent neck abscess	Left
04	1.58	Female	Recurrent thyroid abscess	Left
05	12	Male	Recurrent thyroid abscess	Left
06	12	Male	Recurrent neck abscess	Left
07	12	Male	Recurrent thyroid abscess	Right
08	09	Male	Recurrent thyroid abscess	Left
09	8.91	Male	Recurrent neck abscess	Left
10	1.58	Male	Recurrent neck abscess	Left

**Table 2 (T2) Summary of the procedures and outcome details**

Case No	No of Diathermy Sessions	Outcome		
		State of Sinus Opening	Complications	Duration Of follow up
01	02	closed	Not reported	19 months
02	01	closed	Not reported	21months
03	02	closed	Not reported	21months
04	01	closed	Not reported	20 months
05	01	closed	Not reported	19 months
06	01	closed	Not reported	22 months
07	01	closed	Not reported	16 months
08	01	closed	Not reported	14 months
09	01	closed	Not reported	12 months
10	01	closed	Not reported	09 months

**Discussion**

Imaging with CT and magnetic resonance imaging (MRI) can also detect the sinus tract pathway. According to the published literature, [5] CT is better than MRI in diagnosing piriform fossa sinus tracts. A CT scan can detect up to 64 % of sinus tracts.[5]

(CT imaging description of PFST according to the Sun-Worn Park et al [5] is as follows,

“The sinus tract begins at the piriform sinus apex, coursed antero- inferiorly through the strap muscle layer, either beside or through the thyroid gland into the perithyroidspace.”)

Contrast swallow studies can detect 50% - 80 % of piriform fosse sinus tracts. [4]

In our case series imaging could not localize the sinus opening and the rigid video pharyngoscopy was able to identify and localize the lesion enabling the therapeutic intervention with monopolar diathermy cauterization. As there is no risk of radiation exposure it is best to perform the rigid video pharyngoscopy examination in all suspected patients.

According to a recently published systemic review [7] the overall success rate of endoscopic cauterization was 89.3%. Success rate depended on the techniques used ( mode of cauterization) and the number of treatments attempted. Electrocautery had a success rate of 92.3% (36/39). Success rates of the first, second and third attempts were 77.8%, 87.3% and 90.5% respectively. [7] In our case series the PFST opening was

closed in eight out of ten ( 80%) patients after the first attempt of monopolar diathermy cauterization. Sinus openings of the remaining two patients were closed after the second attempt. T2

All ten patients are free of symptoms at present and the average follow up period was 17 months. Hence our results were comparable to published outcome data.

There were no procedure related complications reported during our study. Theoretically there is a risk of damaging the carotid vessels during diathermy cauterization. The above mentioned systemic review [7] has reported temporary vocal cord immobility in 02 out of 84 patients and that was following cauterization using Trichloro-Acetic acid.

## **Conclusion**

Congenital piriform fossa sinus tract ( PFST) should be considered as a differential diagnosis in patients diagnosed with recurrent neck abscesses specially in the left side neck. Rigid video pharyngoscopy examination should be performed in all patients with recurrent lower neck abscesses specially in paediatric population. As the success rate of our study is comparable with the other published data, All in all we propose that the endoscopic monopolar diathermy cauterization is a safe and effective therapeutic option in the management of the PFST.

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