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Date of submission: 26th March 2020

Date of acceptance: 8th April 2020

DOI: <https://doi.org/10.3126/njn.v17i1.28347>

HOW TO CITE

Chakradhar R, Thapa A. Endoscopic Thoracic sympathectomy for Primary Palmar hyperhidrosis NJS. 2020; 17(1):59-62

To access Nepal Journal of Neuroscience Archives,
scan QR code:



Endoscopic Thoracic sympathectomy for Primary Palmar hyperhidrosis

Abstract

Primary hyperhidrosis is a disorder in which there is an excessive amount of sweating more than required for the body's thermoregulation. It is due to excessive function of the sudomotor sweat control system in the absence of a sweating trigger.

We had a 25-year-old engineer, who presented with complaints of profuse sweating in both his palms, feet and axillae for more than 10 years. He had distressing symptoms disabling his daily activities and causing negative impact in his social, professional, recreational and quality of life. He took medical treatments including topical agents, anticholinergics, iontophoresis and even botulinum toxin injection. All these not only failed to give relief but only aggravated his disappointment.

Endoscopic thoracic bilateral sympathectomy was performed from T2 to T4 level. Drastic improvement was seen in immediate post-operative period. Pre-operative palmar temperature of 90^o Fahrenheit increased to 96.5^o Fahrenheit in immediate post-operative period. His post-operative period was uneventful and was discharged on the second post-operative day. On follow-up after 30 days, the patient was asymptomatic, fully satisfied with the surgery and without any complications.

Endoscopic thoracic sympathectomy is a safe, effective, fast and minimally invasive surgical modality of treatment for primary hyperhidrosis.

Key words: Endoscopic thoracic sympathectomy, Primary hyperhidrosis

Introduction

Primary hyperhidrosis is a physiological disorder of the sympathetic nervous system which is characterized by excessive amount of diffuse or localized sweating more than required to maintain the temperature of the body. The exact pathophysiology and etiology of this condition is poorly understood but it is believed to be due to over activation or hyper stimulation

of the sympathetic nervous system¹. Most commonly it affects palms, axillae, foot or the face but can involve any body parts or whole of the body^{1,2}.

Case Report

Twenty five years male, engineer by profession presented with complaints of severe, spontaneous sweating in both hands, feet and axillae. Symptoms had been present for more than 10 years. He had no other illnesses and no known allergies without any significant past medical and surgical history. He did not smoke or drink alcohol, and denied use of illicit drugs.

No other family members and relatives had similar history. He could not identify any triggering factors for the hyperhidrosis that occurred most of the time. He denied aggravation of symptoms with emotions, environmental temperature or physical effort. A detailed review of systems was positive for generalized anxiety disorder. Further discussion revealed that he had many times thought of quitting his studies because he would slip his pen while writing in exams and he had to write by wrapping his pen with a handkerchief. He often had to hesitate to shake hands with his friends. He had to spend most of his time on computers for his profession and while using a mouse of a computer, he had to cover it with a piece of clot to be able to use it smoothly.

He took medical treatment for the last six months which included topical antiperspirants, anticholinergic drugs and iontophoresis but in vain. He even tried injections of botulinum toxin but was of no benefit. Later he was functionally impaired, unable to perform many activities of daily living, such as brushing his teeth, combing his hair and playing games like cricket and table tennis. Laboratory studies including complete blood count, comprehensive metabolic panel, and thyroid stimulating hormone (TSH) levels were within normal limits.

He met the criteria of Primary hyperhidrosis as per the Multi-Specialty Working group on hyperhidrosis in the United States (MSWG criteria) (Table 1) with Hyperhidrosis Disease Severity Scale (HDSS) score of 4 (Table 2). After pre-operative evaluation and documentation of hyperhidrosis, endoscopic thoracic bilateral sympathectomy was done under general anesthesia with single lung ventilation. He was laid in supine position and ports were placed in 4th ICS posterior axillary line for camera (10 mm), 3rd ICS anterior axillary line for left working port (5 mm), 6th ICS posterior axillary line for right working port (10 mm) for right side. The initial diagnostic thoracoscopy localized sympathetic nerve as the only one white structure travelling at right angle to the ribs (Figure 1). Anatomical landmarks used were ribs counted cephalad to caudad from 2nd to 4th rib and cervicothoracic/stellate ganglion (identified by a fat pad at superior limit of dissection) which was preserved. Mediastinal pleura was dissected from T4 level, caudad to cephalad with hook cautery, once upper thorax was reached, scissors were used to divide nerve at the level of T2 at the base of cervicothoracic ganglion and dissection proceeded upto T4 level with hook cautery, the trunk of freed nerve delivered via one of the trochars (Figure 2 (a), (b) and (c)). Hemostasis was checked, 24 Fr chest tube placed, under vision lung was inflated, ports were removed and wound sutured.

Similar process was repeated on the left side. Since the procedure was done in supine position, there was no need of turning and re-positioning of the patient.

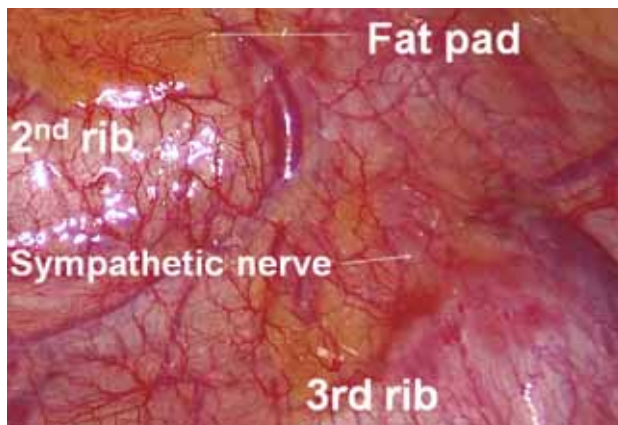


Figure 1: Thoracoscopy and identification of sympathetic nerve

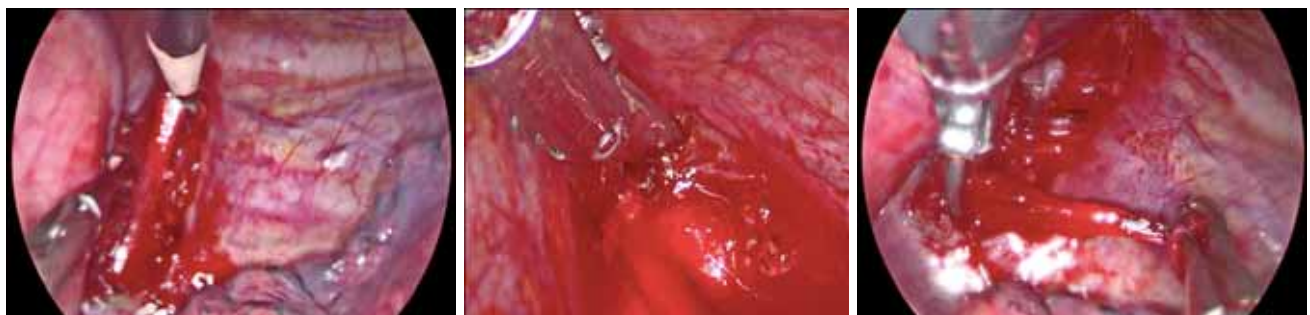


Figure 2: a) Dissection of sympathetic nerve; b) Division at T2 level; c) Division at T4 level

Primary Hyperhidrosis	<ul style="list-style-type: none"> • Focal, visible and excessive sweating of atleast six months duration without apparent cause. • Atleast two of the following: <ul style="list-style-type: none"> ○ Bilateral and relatively symmetric ○ Impairs daily activities ○ Atleast one episode per week ○ Age of onset <25 years ○ Family history of hyperhidrosis ○ Cessation of focal sweating during sleep. • Exclusion of secondary causes of excessive sweating
Secondary Generalized Hyperhidrosis	<ul style="list-style-type: none"> • Generalized excessive sweating attributable to a definitive underlying medical cause; most commonly drugs, substrate abuse, cardiovascular disorders, respiratory failure, infections, malignancies, endocrine/metabolic disorders or neurologic disease.
Secondary Regional Hyperhidrosis	<ul style="list-style-type: none"> • Localized anhidrosis with compensatory excessive sweating in other areas. • Identification of a definitive underlying cause; most commonly stroke, peripheral nerve damage, spinal cord lesion, neuropathy or Ross syndrome
Secondary Focal Hyperhidrosis	<ul style="list-style-type: none"> • Excessive sweating in typical anatomic sites (palms, soles, axillae, craniofacial) or in a well defined anatomic distribution (trunk, inguinal folds, buttocks, legs, submammary folds, neck or wrist). • Identification of a definitive underlying cause; most commonly Frey syndrome, eccrine nevus, social anxiety disorder, neurologic disorder, or tumor.

Table 1: Criteria for diagnosis

My sweating is never noticeable and never interferes with my daily activities	Score 1
My sweating is tolerable but sometimes interferes with my daily activities	Score 2
My sweating is barely tolerable and frequently interferes with my daily activities	Score 3
My sweating is intolerable and always interferes with my daily activities	Score 4

Table 2: Hyperhidrosis Disease Severity Scale (HDSS)

Post-operatively he was monitored in the post-operative ward. Post-operative chest x-ray showed well expanded lungs. He was started on sips of liquid after six hours and incentive spirometry was advised as per his comfort. Chest tube was removed after 24 hours. He was mobilized and given a normal diet; his hospital stay was uneventful and he was discharged on the second post-operative day.

Pre-operatively his core body temperature was 98.6°F and bilateral palmar temperature were 90°F which increased to 96.5°F in immediate post-operative period. Patient began to feel better as his hands became dry. During discharge and on follow-up after one month, patient was completely asymptomatic with resolution of excessive sweating of his hands and axillae. His HDSS score improved to 1. He was fully satisfied by the surgery as he also did not have any complications of surgery and further started enjoying normal activities of daily living.

Discussion

Primary hyperhidrosis is a disorder of excessive sweating where there is more sweating than required for

the body's thermoregulation. It is due to excessive function of the sudomotor sweat control system in the absence of a sweating trigger³. Primary hyperhidrosis is a rare and non life threatening condition but it has significant and distressing psychological, social and professional impacts which is often disabling¹. Profuse and uncontrollable sweating can interfere with the educational, occupational and recreational aspects of an individual's life thereby disabling them to maintain intimate relationships, perform daily activities, work in certain jobs and hence many patients suffer its negative impact on quality of life.

Family history is often positive in 35% to 56% of patients with hyperhidrosis and the pattern of inheritance is most likely autosomal dominant with variable penetrance. Genetic linkage to chromosome 14 may be present according to a recent report.⁴ The incidence of hyperhidrosis in the United States has been reported as 2.8% of the general population, affecting men and women equally with the highest prevalence among 25 to 64 year old population.^{4,5} The average age of onset is 25 years; however this can differ depending on the affected area. Palmar hyperhidrosis has the earliest average onset at age 13.⁵

A complete history and physical exam are important initial steps in the evaluation of excessive sweating. When the symptoms are characteristic of primary focal hyperhidrosis, then diagnosis can be made without any requirement of laboratory testing.² If there are no other obvious causes, such as hyperpituitarism, diabetes mellitus, and spinal cord injury, a TSH is often obtained to evaluate for hyperthyroidism as a cause.⁵

The Multi-Specialty Working Group on Hyperhidrosis in the United States has proposed some criteria for the diagnosis of hyperhidrosis.^{4,6} (Table 1)

Once the diagnosis is made, the severity of hyperhidrosis should be determined. The Hyperhidrosis Disease Severity Scale (HDSS) is a qualitative measure of the severity of the patient's condition based on the effect on activities of daily living.^{2,5} A score of 3 or 4 indicates severe hyperhidrosis and a score of 1 or 2 indicates mild or moderate primary hyperhidrosis. It is important to measure the disease severity using the HDSS score because it helps to determine proper course of treatment and to monitor the results of treatment. A treatment success is defined as an improvement from a score of 4 or 3 to a 2 or 1 or from a score of 2 to 1 whereas treatment failure can be defined as no change in HDSS score after one month of therapy or lack of tolerability for the treatment.²

Initial management for palmo-plantar hyperhidrosis is supportive, which includes keeping the hands and feet as dry as possible by use of absorbent hand and foot powders. Treatment options for primary hyperhidrosis include medical and surgical treatments.² Medical treatment is often unsuccessful and the response is usually transient however it should be tried initially in all patients.¹ Medical treatments include therapy, such as topical aluminium chloride, oral anticholinergic agents, iontophoresis, and botulinum toxin A injections.

The interruption of the sympathetic innervations of the eccrine sweat glands via upper thoracic ganglia during surgery is considered as the best procedure for hyperhidrosis. Surgery of thoracic sympathetic nerve has been known to be performed since the beginning of the 20th century as it was first described by Hughes in 1942 but remained rare until the introduction of VATS in the 1980s. Since then endoscopic thoracic sympathectomy (ETS) has become the gold standard of treatment of hyperhidrosis giving the patient the chance to achieve both functional and aesthetic results with minimal risk and discomfort together with an excellent post-operative quality of life.¹

Compensatory sweating is the most common and disabling complication of ETS which is believed to be due to a thermoregulatory mechanism.² Other complications

that may occur include pneumothorax, pleural effusion, hemothorax and chylothorax. Less frequent complications include subcutaneous emphysema, wound infections, segmental atelectasis and transitory lesions of brachial plexus.¹

Conclusion

Endoscopic thoracic sympathectomy is a safe, easy, fast, effective and minimally invasive procedure for primary hyperhidrosis. Patient satisfaction, permanent cure and improvement in quality of life with the surgery is superior than with non surgical methods of treatment though there are some chances of complication such as compensatory sweating.

Conflict of Interest: None

Acknowledgement: We acknowledge the contribution of Dr Deepak Raj Singh in the surgical management.

References

1. Oncel M, Sunam GS, Erdem E, Dereli Y, Tezcan B, Akyol KG. Bilateral thoracoscopic sympathectomy for primary hyperhidrosis: a review of 335 cases. **Cardiovasc J Afr.** 2013; 24(4):137-40. <https://doi.org/10.5830/CVJA-2013-007>
2. Solish N, Bertucci V, Dansereau A, Hong HC, Lynde C, Lupin M, et al. A comprehensive approach to the recognition, diagnosis, and severity-based treatment of focal hyperhidrosis: recommendations of the Canadian Hyperhidrosis Advisory Committee. **Dermatol Surg.** 2007; 33:908-23. <https://doi.org/10.1111/j.1524-4725.2007.33192.x>
3. Jamani NA, JahnKassim PS, Hadi AA. The man with sweaty palms and soles. **Malays Fam Physician.** 2018; 13(1):52-4. PMID: PMC5962237
4. Moraites E, Vaughn OA, Hill S. Incidence and Prevalence of Hyperhidrosis. **Dermatol Clin.** 2014; 32(4):457-65. <https://doi.org/10.1016/j.det.2014.06.006>
5. Kenny K. Diagnosis and treatment of hyperhidrosis. **Nurse Pract.** 2009; 34(7):10-1. <https://doi.org/10.1097/01.NPR.0000357242.88678.cc>
6. Walling HW. Clinical differentiation of primary from secondary hyperhidrosis. **J Am Dermatology.** 2005; 64(4):690-5. <https://doi.org/10.1016/j.jaad.2010.03.013>