Brief Communication

Endoscopic versus trans-axillary thoracic sympathectomy for primary axillary and palmar hyperhidrosis and facial blushing

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Abstract

Background: Thoracic sympathectomy is a frequent treatment performed across the world to treat facial flushing as well as primary axillary and palmar hyperhidrosis. Thoracic sympathectomy is indicated by sympathetic dystrophy, cardiac disease, and blue finger syndrome. Although thoracic sympathectomy can be used to treat finger vasospastic disorders, it has been less successful. Therefore, effective treatment is necessary to cure this complication.

Objective: The aim of the research explores the effective treatment option from endoscopic intervention and trans-axillary thoracic sympathectomy to treat primary axillary, palmar hyperhidrosis and facial blushing.

Materials and method: Between 2014 and 2020, a total of 50 thoracic sympathectomies were performed in Huangdao District Hospital., with 10 being surgical and 40 endoscopic. X-ray of the chest was performed to rule out apical pleural syndrome, which indicates the existence of an adhesion. The surgeries performed on the hospitalised patients were carried out unilaterally. A contralateral intervention was conducted 6–8 weeks after the operation. The surgical sympathectomy was performed using the trans-axillary route. Operations were conducted, October 2014 to April 2017, followed by thoracoscopic therapy. Trans-axillary techniques were employed to access the thoracic sympathectomy, which improved aesthetic outcomes and allowed for better anatomical exposure. For thoracoscopic sympathectomy, the patients were sedated with a double-lumen endotracheal tube. They were evaluated to determine their level of satisfaction with the entire therapy regimen.

Result: During the surgery no death was reported. In trans-axillary thoracic sympathectomy procedure, out of 15 patients, one patient had post-operative facial blushing. The efficiency of the blushing was 93.32%. In endoscopic intervention treatment, 24 patients have undergone surgery for hyperhidrosis of the palms and axillae with or without blushing. All the patients were satisfied with the treatment results. Three patients were found to have moderate sweating after ten months of operation. No condition was considered problematic as compared to the pre-operation stage. The sympathetic activity relapse rate was 14.3%. Compensatory sweating was found among 67% of patients. Gustatory sweating and phantom sweating were found among 37.5% and 29% of the patients respectively.

Conclusions: There were no patients were considered these side effects troublesome. The outcomes of the research proved that there is not much variation in results. However, there is no difference in the efficiency between the endoscopic intervention and tarns-axillary thoracic sympathectomy. The endoscopic efficiency is linked with the short hospital stay period, less pain, and fast recovery. It's concluded that thoracic sympathectomy is considered a better choice for treating excessive facial blushing and primary hyperhidrosis. [*Ethiop. J. Health Dev.* 2021; 35(4) 419-422]

Keywords: Thoracic Sympathectomy; Blushing Hyperhidrosis; Physiological response; Ganglia

Introduction

Endoscopic thoracic sympathectomy (EST) has become very popular in the recent years. EST is a general procedure for primary axillary and facial blushing and palmar hyperhidrosis. While for facial blushing, no treatment is required, the exact mechanism for facial blushing is unknown. The interaction between the cardiovascular system and emotional stimuli has been a contributing factor behind the extraordinary blushing. The other contributing factor for blushing is the superficial plexus filling or arterial dilation due to the cerebral inhibition of vasoconstrictor tone (1). The patients' societal and working relations can be affected due to these physiological responses. Sweating of the different body parts known as the essential hyperhidrosis happens mainly on the palms and axillae of the hand, which can be embarrassing and awkward. It occurs in at least 0.6% to 1% of the population (2). For the last two decades, this problem mainly happens to younger people, which generally start in the puberty stage. Similar to facial blushing, hyperhidrosis also affects professional and societal life, which could lead to emotional problems Treatment of facial blushing and hyperhidrosis is determined by the degree of suffering of the patients. In more than 40% of cases, hyperhidrosis, along with facial blushing, happens due to the pseudomotor and vasomotor fibers. Using the thoracic sympathectomy method, ipsilateral facial blushing is eliminated and often partially removed. Thoracic sympathectomy happens for facial blushing and hyperhidrosis in the last few years. Our study aims to present the last five years' results of thoracic sympathectomy in relation to hyperhidrosis and facial blushing.

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Materials and Methods

Between 2014 and 2020, about 50 thoracic sympathectomies were performed in Huangdao District Hospital. Among all sympathectomies, 10 were surgical, and 40 were endoscopic (Table 1). The endocrinology department checked all the patients. X-ray of the chest was performed to eliminate apical pleural syndrome which suggests presence of an adhesion. The operations on the admitted patients were done unilaterally. After a 6-8 weeks period of the surgery, a contralateral intervention was performed. The trans-axillary approach was used to perform the surgical sympathectomy. Surgeries were performed from October 2014 to April 2017, following which treatment was given thoracoscopically. Trans-axillary approaches were used to open thoracic sympathectomy, which increased cosmetic results and provided good anatomy exposure. Patients were anesthetized using a double-lumen endotracheal tube for thoracoscopic sympathectomy. The patients were placed on the operation table in the lateral decubitus position, with the upper arm abducted by 90^{o} angle. Three trocars were introduced over the third intercostal space at the anterior axillary, mid-axillary, posterior lines. Posterior and mid-axillary trocars were placed for the instrumentation purpose, while the anterior trocars were placed for the thoracoscope. Using a Verres needle, the lung was deflated slowly by injecting the carbon-di-oxide (0.5-1.01%, pressure amount 4mm Hg) within the intrapleural space. After sympathetic chain identification, the T2-T5 thoracic ganglia and their interconnecting fibres are resected for hyperhidrosis. Depending on the patients suffering due to blushing, 1/3 of the satellite ganglia needs to be respected. Before lung reinflated, A 12 Charriere drain is placed on the posterior axillary line through the incision, under direct camera surveillance. All specimens are checked histologically. After dram removal, a post-operative X-ray is performed routinely. The day after the endoscopic operation, most patients can leave the hospital. The patients were interviewed for their assessment of the satisfaction with the whole treatment procedure. Their responses were categorized as "good," "excellent," "poor," "no change," or "some improvement" to every patient's pre-operative condition and each treated limb. The outcome for cosmetics was marked as " satisfactory", "Poor", or "excellent".

Results

All limbs were dry and warm after surgery. The list of complications is presented in Table 1. There was no mortality before surgery. In table 2, the long-term data is included. Out of 15 patients, one patient had post-operative facial blushing. The efficiency of the blushing is 93.32%. The unilaterally operated patients having to blush are not taken into consideration, for the evaluation. A Total of 24 patients have undergone surgery for hyperhidrosis of the palms and axillae with or without blushing. All the patients were satisfied with the treatment results. There were three patients observed for moderate sweating after ten months of operation. No condition was considered problematic as compared to the pre-operation stage. The sympathetic activity relapse rate was 14.3%. In the case of 67% of patients, compensatory sweating was found. While 37.5% of Gustatory sweating found, and we found phantom sweating in 29%. All the problems are considered as side effects.

Table 1: Description of patients with sympathectomies

Sympathectomies		
	Surgical	Thoracoscopic
Total number of operations	10	40
Bilateral operation	5	18
Unilateral operation	0	5
Total number of patients	5	23
Male/Female	3/2	14/9
Age (years)	20-46	14-49
Average age (years)	32.56	31.0
Follow up (Months)	44-64	0-32
Average follow up (Months)	52.23	11.22
operation indication		
Blushing patients	0	4
Hyperhidrosis patients	1	7
Blushing and Hyperhidrosis	3	13
Adverse effects		
Horner’s syndrome	1	1
pneumothorax	0	1
Neuralgia	1	4
winged scapula (transient)	4	0

Table 2: **Long-term outcome data of patients with sympathectomies**

	sympathectomies		total
	Endoscopic	Surgical	
Patients with long-term data	18	6	24
Hyperhidrosis	15	6	21
Blushing	10	5	15

Discussion

Thoracic sympathectomy is an effective and permanent treatment for facial blushing and primary axillary and palmar hyperhidrosis. Though thoracic sympathectomy can be used for finger vasospastic conditions treatment, it is proven to be less effective (1,3). Sympathetic dystrophy, cardiac disease, and blue finger syndrome indicate thoracic sympathectomy (4,5,6). There is no report for the thoracic sympathectomy for cardiac problems like tachycardia, angina pectoris (7). Facial blushing is a less common symptom of thoracic sympathectomy. Vasomotor and sudomotor intervention is generally associated with blushing and sweating. The sudomotor and vasomotor activity-related preganglionic neurons begin in the C8-L2 spinal cord parts. The post-ganglionic fibers rise through the cervical sympathetic trunk and reach the respective organs through the different pathways. The precise mechanism for the blushing is still undiscovered. Insignificant cases show that hyperhidrosis and Blushing happen due to the sudomotor fibers and vasomotor fibers. Many factors lead to hyperhidrosis, so pre-operative screening of patients is needed to eliminate the disorders like the traumatic lesions of the peripheral or central nervous system, hyperthyroidism, pheochromocytoma, diabetes mellitus, etc. (8). Unilateral hyperhidrosis is caused by the eccrine glands Hamartoma (9). This situation is treated by the anticholinergic or the sympatholytic agents (10). Due to the different side effects, the medical treatment has limited application. Many medicines are available for hyperhidrosis, but their application has low success in the earlier treatment (11). Sometimes an axillary sweat gland excision is performed (12). While psychotherapy and behavioural treatment also have low success rates (13).

Different treatment procedures for the thoracic sympathectomy are available such as, thermocoagulation, chemical ablation with alcohol injection CO_2 laser irradiation, open surgical intervention, which has been tested for many years, having different success rates. Due to long-term relapses, chemical sympathectomy with computed or ultrasound tomography has been discontinued (14). The short-term convincing result was shown by the radiofrequency or thermocoagulation destruction of the thoracic sympathetic ganglia, but these methods need to be studied further (15). Due to the long-term effectiveness, operational thoracic sympathectomy has been well accepted. There is still low patient satisfaction due to post-operation pain, the risk of nerves and large vessels damage, and up to 20% morbidity with various complications (16). According to our experience, 1/3 lower satellite ganglionic excision and T2 to T5 sympathetic ganglionic excision show satisfactory results. Despite the Horner's syndrome risk, 1/3 of lower satellite ganglion excision is needed to treat blushing (17). Due to sympathetic chain anatomic variability, sympathetic denervation determination is challenging. While few doctors extensively de-nerve T1 to T2 ganglia, other doctors find only T2 ablation is enough for treatment. According to Thurrott, (6) T2 to T3 ganglionectomy is sufficient for the hand's sympathetic denervation, while for the axillary area, T4 ganglionectomy is required. Most researchers agree with the T2 to T4 ganglionectomy for the upper limb's optimal sympathetic denervation. Due to the thoracic sympathectomy in the hyperhidrosis treatment, the success rate varies between 90% to 100%. Excision or partial coagulation of the sympathetic chain is the cause of the failure in the early stage. Therefore, we favour excision to coagulation despite the several controversies of thoracic sympathectomy efficacy.

Although several authors believe a relapse after sympathectomy is less likely to occur, other researchers show that late recurrences probability is happening due to the post-ganglionic fiber section. Hyperhidrosis recurrence within 18 months after proper operation happens in the case of 6.4% of patients. According to the study, after ten months of surgery for hyperhidrosis patients sweating starts in 3 patients out of 21. After 32 months of follow-up, the late recurrence of hyperhidrosis was found 14%-15%. Thoracic sympathectomy has side effects like excessive sweating in the lower body parts. About 67% of patients of the study group accept this sweating problem as a minor problem than the original hyperhidrosis. The compensatory hyperhidrosis incidence happens from 0 to 75%. Various authors reported 8 to 50% gustatory sweating, which is found to be like this study. Phantom seating is reported in 10-48% of patients, and in our group of patients, 29% have phantom sweating, though the exact mechanism of this is not precise. Surprisingly, the patients are not aware of the side effects till our interview, except for one patient with compensatory sweating. None of the patients have a societal problem due to the side effects relative to the original problem. The patient agreed to the side effects after giving details about the side effect to the researcher. Or After endoscopy,

the complications were reduced. The complications were transient or permanent Horner's syndrome, like hemothorax, neuralgia, numbness areas, pneumothorax. Due to some complications in thoracoscopy, unilateral intervention was chosen afterwards a contralateral side was conducted in 8 weeks, while the other researchers have reported good results. Most patients leave the hospital a day after the thoracoscopic sympathectomies. they also start their everyday working life after one week of the surgery. After trans-axillary thoracic sympathectomies, the average stay period in the hospital is about 5-6 days, and the maximum number of patients usually starts after eight weeks of the operation. After the endoscopic intervention, post-operative analgesics medication is required for 7 to 10 days, whereas open surgery patients continue analgesics medication for a minimum of 3-4 weeks. In both groups, no pulmonary disorders were noted.

Conclusion

We can conclude that thoracic sympathectomy is a valuable procedure, and a convenient and safe method. In terms of efficiency, there is no variation between endoscopic intervention and trans-axillary thoracic sympathectomy. The endoscopic intervention is associated with a short period of hospital stay and less pain, and a fast recovery. For excessive facial blushing and primary hyperhidrosis treatment, endoscopic thoracic sympathectomy is the best choice for doctors and patients.

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