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Single incision thoracoscopic sympathectomy for palmar and axillary hyperhidrosis

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Abstract

Background: Primary hyperhidrosis is characterized by excessive sweating beyond physiological needs. It is a common disease (incidence 2.8%) that causes intense discomfort for patients. In the last decade, advantages of Single-Incision Thoracoscopic Sympathectomy have become clear, particularly in decreasing morbidity of sympathectomy.

Patients and methods: From January 2010 to December 2012, 39 patients (29 females and 10 males) with primary palmar or axillary hyperhidrosis were treated by thoracoscopic sympathectomy. The age ranged from 18 to 40 years with a mean of 26.28 years. We used single incision thoracoscopic electrocoagulation through 10 mm incision for thoracic sympathetic chain (T2–T4).

Results: The mean follow-up was 23.6 ± 14.2 months (range = 4–24 months). A total of 97.42% of patients were satisfied with the results. A total of 72.5% of patients had cure, one patient (2.5%) and another patient (2.5%) presented with recurrent axillary hyperhidrosis. The morbidity was 10.2% with no mortality. Percentage of compensatory sweating and gustatory sweating were 5.1% (p = .353) and 2.5% (p = .552), respectively. The result of sympathectomy in patients with both palmar and axillary hyperhidrosis was significantly better (17, 43.58%) compared to palmar type (14, 35.89%) or axillary type (7, 17.94%).

Conclusion: Thoracoscopic sympathectomy is a simple, safe, and cost-effective therapy with good results and low complications.

Keywords

Hyperhidrosis, single incision thoracoscopic sympathectomy

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Introduction

Primary (essential) hyperhidrosis is a disorder with an unknown cause and is characterized by excessive sweating beyond physiological needs, particularly in response to temperature and emotional stimuli.[1] It is a common disease that affects men and women equally, with a peak incidence in the late second and early third decades of life and an incidence in the Western world of up to 2.8% of the population.[2,3] Most affected patients have palmar (–plantar) hyperhidrosis, but combined palmar–axillary hyperhidrosis, isolated axillary hyperhidrosis, and craniofacial hyperhidrosis are relatively common as well.[4] The second (T2) and third (T3) thoracic ganglia are typically felt to be responsible for palmar hyperhidrosis, while the fourth (T4) thoracic ganglia primarily controls axillary hyperhidrosis.[5] The principal characteristic of this disease is the intense discomfort of most of the patients which affects their social, affective, and professional life.[2,3]

In the absence of secondary causes, primary hyperhidrosis has traditionally been treated medically first but unfortunately all conservative managements including drug therapies and injection of botulinum toxin have been associated with unsatisfactory results while minimally invasive thoracoscopic sympathectomy may result in a successful control of symptoms.[6]

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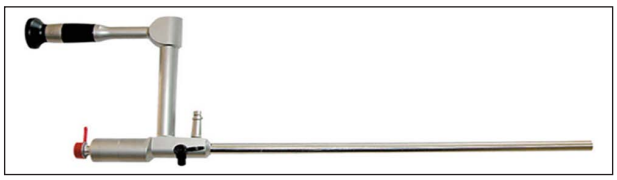

Figure 1. Schölly laparoscopic 10 mm scope 0° (GmbH Germany).

Herein, we are presenting our experience with this technique for patients with primary palmar and axillary hyperhidrosis.

Patients and methods

From January 2010 to December 2011, a total of 39 patients consecutively underwent thoracoscopic surgery for upper limb primary hyperhidrosis. The sample comprised 29 female (74.4%) and 10 male (25.6%) patients with a mean age of 26.28 years (range 18–40 years). In all cases, the procedure was unilateral. The operation side was decided according to the patients' preference although the pathology was bilateral in all. Written information about the technique along with the results and side-effects was given to the patients during the first consultation. Individual consent was obtained before the surgery. This study was approved by the ethics committee of the school of Medicine at the University of Sulaimani. All the patients underwent the same preoperative study, which consisted of clinical history, chest x-ray, electrocardiogram, complete blood count, general biochemistry and fasting blood glucose measurement with coagulation parameters, determination of thyroid function, and respiratory function test. During the entire period of this study, none of the patients were operated for the second side because of the number of patients in the waiting list.

Detailed history of the patient's occupation was obtained to understand the nature of the social handicap caused by the disorder.

The surgery was conducted under general anesthesia with double-lumen endotracheal intubation. The patient was placed in lateral decubitus position. A Schölly laparoscopic 10 mm scope 0° (GmbH Germany) (Figure 1) was inserted into the fourth intercostal space in the mid-axillary line via a re-useable laparoscopic 10 mm port.

Sympathectomy was performed at T2–T3 ganglia in cases of palmar hyperhidrosis and to the T2–T3–T4 in axillary patients by means of diathermy ablation with resection of a segment of the chain for histopathological examination. To prevent medico-legal problems, collateral nerve trunks were coagulated (nerve of Kuntz). Hemostasis and evacuation of the pneumothorax were accomplished by means of air aspiration through the endoscope working channel. No chest tube was left in place. The port incision was closed with subcuticular 4/0 synthetic absorbable stitches. The patients were discharged in the first postoperative day if the chest x-ray was favorable. The mean duration of surgery was 45 min.

Table 1. Patients' occupations.

Occupation	Frequency	%
Student	15	38.46
Teacher	10	25.64
Clerk	8	20.51
Soldier	3	7.69
Free worker	3	7.69
Total	39	100

All the patients completed a preoperative questionnaire before surgery. The independent study variables were family history of primary hyperhidrosis, location of the hyperhidrosis, associated symptoms, and negative repercussions of the primary hyperhidrosis on family, friends, spouse, and work.

The patients completed another questionnaire 8 weeks postoperatively to record data about postoperative pain, partial drooping of the eyelid, compensatory hyperhidrosis, gustatory hyperhidrosis, degree of hand, and/or axillary dryness.

Evaluation of the results was conducted subsequently in outpatient private clinic to determine the long-term outcome with minimal period of 12 weeks and maximal of 24 months to register satisfaction or dissatisfaction with the surgery.

Results

Demographic analysis of the patients' occupations in this study showed that the majority were students followed by teachers in the second rank (Table 1). In the family history, 69% of patients reported positive history for similar condition in their first-degree relatives.

Analysis of the data showed that the right side (25, 64.1%) is more frequently operated on in comparison to the left side (14, 34.9%) (Table 2).

A total of 38 patients (97.42%) were satisfied with the result of the operation. In 73.7% of the cases, they did not sweat at all, while in 2.6% of the cases the results were not acceptable (Figure 2). The result of sympathectomy in patients with both palmar and axillary hyperhidrosis was significantly better with regard to the rate of satisfaction and improvement of symptoms 17 (43.58%) compared with patients with pure palmar symptoms (14, 35.89%) or axillary symptoms (7, 17.94%) (Table 3). As a part of measurement of treatment efficacy and patient satisfaction, we used the Hyperhidrosis Disease Severity Scale (HDSS) to rate the severity of the disease and to measure the postoperative outcome. The treatment will be successful if score improved from 4 or 3 to 2 or 1 or from a score 2 to 1. Treatment failure can be defined as no changes in HDSS score after 1 month of therapy or lack of tolerability for the treatment (Table 3).

Table 2. Gender and side affected.

Side affected	Gender	
	Female	Male
	N (%)	*N* (%)
Right	17(68.0)	8(32.0)
Left	12(85.7)	2(14.3)

Figure 2. Patient's satisfaction pattern.

The intraoperative mortality was 0% and the morbidity was 2.5% (one minor intraoperative bleeding). The mean duration of surgery was 25.7 min (9–60), the duration of the surgery was different because of anesthetic difficulties and presence of adhesions between the lung and chest wall which was released properly. The mean hospital stay was 1 day.

During the mean follow-up period of 23.6 ± 14.2 months (range 4–24 months), only one patient (2.5%) presented with recurrent left axillary hyperhidrosis; this patient underwent another thoracoscopy for re-interruption of the sympathetic chain at 6 months from his first intervention but the condition was not relieved postoperatively, hence the patient was sent for electrocoagulation of the sweat glands 1 year after his second intervention. Electrocoagulation was done for him with relative improvement.

Only one patient was completely dissatisfied by the result of the operation, and this patient underwent electrocoagulation for his axilla (Figure 2). The rates of compensatory sweating and gustatory sweating were 5.1% (p = .353) and 2.5% (p = .552) respectively; their symptoms were improved at 6 months postoperatively (Table 4).

Discussion

Before the introduction of video-assisted thoracoscopic surgery (VATS) and the advances in video-endoscopic technology, thoracotomy was the standard surgical approach for hyperhidrosis, which was considered relatively as serious surgery for a relatively simple procedure.[7] Since the 1990s, endoscopic thoracic sympathectomy has become a well-established surgical treatment for hyperhidrosis with relatively low morbidity and mortality.[5]

In the absence of specific and effective medical treatment for primary hyperhidrosis, thoracoscopic sympathectomy was widely accepted as treatment option by different authors working in the field. Further refinement in this field is single-port sympathectomy, which is nowadays the preferred method for treating palmar and/or axillary hyperhidrosis.[8–10] The success rate of thoracoscopic sympathectomy in general is about 95% in most published series.[8–10] We report a success rate of 97.42% of our cases, which is higher than most of the published series.

Patients, occupation, and social relations have a great impact on patients' complain; in this series, the majority of treatment demanders were students and teachers, from which we may conclude that fine handworks are affected by this pathology or that the stress of education may increase the severity of the situation; these findings are similarly discussed by Wali.[10]

Table 3. Rate of satisfaction.

Site of hyperhidrosis	Very satisfied	Satisfied	Dissatisfied
Palmar	10 (25.64)	4 (10.25)	1 (2.56)
Axillary	6 (15.38)	1 (2.56)	–
Both	13 (33.33)	4 (10.25)	–
Total	29 (74.35)	9 (23.07)	1 (2.56)

Table 4. Complications experienced by patients (expressed as percentages). The p values were calculated using t-test for t-distribution and comparing the total number of patients (i.e. male plus female) in each group. In every comparison, the p value was >.05 (not significant).

	Sex		p values for the complications
	Female n (%)	Male n (%)	
Side			.2243
Right	17 (68.0)	8 (32.0)	
Left	12 (85.7)	2 (14.3)	
Site of hyperhidrosis			
Palmar	13 (86.7)	2 (13.3)	.300
Axillary	4 (57.1)	3 (42.9)	
Both	12 (70.6)	5 (29.4)	
Compensatory sweating			.353
Negative	27 (73.0)	10 (27.0)	
Positive	2 (100.0)	0 (0.0)	
Gustatory sweating			.552
Negative	28 (73.7)	10 (26.3)	
Positive	1 (100.0)	0 (0.0)	
Other complications			.418
Negative	28 (75.7)	9 (24.3)	
Positive	1 (50.0)	1 (50.0)	

Still the debate is ongoing about which levels and how many levels of sympathectomy ensure the highest success rate and carry the lowest incidence of compensatory hyperhidrosis.[5] In our series, we found that for patients with palmar hyperhidrosis, a T2–T3 sympathectomy is effective with a success rate of 97%–99%, but one of the patients in this group was totally dissatisfied with the procedure. While in treatment of axillary hyperhidrosis by T2, T3, T4 sympathectomy, we found the results are better with a success rate of about 100%, in combined cases, we found less acceptable results with a failure rate of about 2.5%.

According to Lin and Wu,[11] Kuntz fiber plays only anatomic and no clinical role in surgical failure of sympathetic surgery, as its incidence is about 60% in clinical studies, while the surgical failure rate is only 1.5% when it is preserved; depending on these facts, we interrupted the Kuntz fibers at the corresponding levels to minimize the rate of failure and complications.

Different types of procedure are described in the literature such as sympathicolysis, sympathectomy, clipping of the chain, and interruption by ultrasonic scalpel; however, no procedure proved to be superior to others in term of efficacy or lower rate of complications.[12–14] Hence, we performed sympathectomy for all patients and proved its effectiveness by histopathological examination of the resected segment.

Our series sample is relatively small, but still the result of successes and complications is similar to the results of larger sample studies.[15]

The intraoperative mortality was 0 but the morbidity rate was 2.5% due to a minor bleeding from a branch of an intercostal vein which was resolved without sequel. Although most published series report similar complication rates, we found no examples of chylothorax, nervous lesions, or pulmonary edema.[9]

During the entire postoperative period, the collective rate of complications was 12.8%, which was distributed between compensatory sweating, 5.12% ($p = .353$); gustatory sweating, 2.5% ($p = .552$); pneumothorax, 2.5%; and recurrence of the symptoms, 2.5%. These results are similar to the most published series.[12] These complications were treated accordingly. For the recurrence case, we offered re-thoracoscopy and even after the second operation the patient's symptoms did not improve.

Although 10 of our patients were discharged home on day 0 postoperatively, we still prefer to keep the patient in the hospital for 1 day for better follow-up. Some authors prefer to perform thoracoscopy as a day case surgery whenever the criteria for that are applicable.[16]

In all of our patients, we performed unilateral uni-port surgery; although we discussed bilateral surgery with our patients, we preferred to let the patients feel the result of the surgery before performing surgery for the other side and to avoid any systemic complications that may associate with bilateral interruption of the sympathetic chain such as bradycardia, syncopal attacks, heart block, and limitations in the respiratory functions as stated by many authors. This approach is a valid and safe approach and many authors still prefer it despite the fact that it includes two sessions of general anesthesia.[17,18]

Conclusion

Thoracoscopic dorsal sympathectomy is a safe and effective method for treatment of primary hyperhidrosis with relatively minimal morbidity. Single incision thoracoscopic sympathectomy (SITS) is as effective as two- or three-port approaches.

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Declaration of conflicting interests

No conflicts related to this article.

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