

Complications of video assisted thoracoscopic sympathectomy for primary hyperhidrosis

Mohammad I. Al-Tarshibi, MD, JBS, Fawaz A. Khamash, MD, JBTS, Haytham M. El-Khushman, MD, FCCP.

ABSTRACT

الأهداف: توثيق المضاعفات المحتملة ومدى حدوثها عند قطع العصب الودي بواسطة تنظير الصدر بمساعدة الفيديو، حيث أنها العملية الجراحية الأمثل لعلاج فرط التعرق الابتدائي في مراكز عالمية متعددة.

الطريقة: تمت هذه الدراسة الاستيعابية في مدينة الحسين الطبية - الأردن، ما بين إبريل 2001م ويناير 2006م. أجريت عملية استئصال العصب الودي لمائتين وسبعة مريضاً لعلاج فرط التعرق الوجهي، الإبطيني و/أو الكففي. استمرت المتابعة لمدة سنة. تم توثيق وتحليل جميع المضاعفات المبكرة و المتأخرة الممكن حدوثها.

النتائج: شكل الذكور (59.4%) من المرضى المدروسين. متوسط العمر (المدى) كان 25.2 ± 4.6 (13-34) سنة. كان فرط التعرق الكففي العارض الرئيسي لاستئصال العصب الودي لمائة وثلاثة وخمسون مريضاً (73.9%)، أربعة مرضى (1.9%) كان لديهم فرط تعرق إبطيني، وكان تعرق واحمرار الوجه لسبعة مرضى (3.4%). فرط التعرق الكففي مصحوباً بتعرق الإبطين و/أو تعرق الوجه وجد عند 43 مريضاً (20.8%). كان فرط التعرق التعويضي المضاعف هو الأكثر تدويناً حيث حدث لمئة واثنان وأربعون مريضاً (68.6%).

خاتمة: يبقى التعرق التعويضي المضاعف الأكثر حدوثاً والأكثر تعجيزاً لعملية قطع العصب الودي بواسطة تنظير الصدر بمساعدة الفيديو عند مرضى فرط التعرق الابتدائي. يجب إجراء دراسة أكثر تعمقاً لطرق بديلة وأكثر انتقائية غير قطع الجذع الرئيسي لتقييم فعاليتها في تخفيف مضاعفات التعرق التعويضي.

Objective: To document the possible complications of video-assisted thoracoscopic sympathectomy procedure and their frequency of occurrence.

Methods: This retrospective study was conducted at King Hussein Medical Center, Amman, Jordan, between April 2001 and January 2006. Two hundred and seven patients underwent thoracoscopic

sympathectomy for the treatment of facial, axillary, and/or palmar hyperhidrosis. Follow up was completed for one year. All possible early and late complications were documented and analyzed.

Results: Males constituted 59.4% of the studied patients. Mean age (range) was 25.2 ± 4.6 (13-34) years. One hundred and fifty-three patients (73.9%) had palmar hyperhidrosis as the main indication for sympathectomy, 4 patients (1.9%) had axillary hyperhidrosis, and facial sweating or blushing in 7 patients (3.4%). Palmar hyperhidrosis combined with axillary and/or facial sweating were found in 43 patients (20.8%). The most common recorded complication was compensatory hyperhidrosis, which occurred in 142 patients (68.6%).

Conclusion: Compensatory sweating remains the most common, and most disabling complication of video-assisted thoracoscopic sympathectomy. Other alternative more selective methods, rather than cutting the main trunk should be studied thoroughly to assess their efficacy in reducing the complication of compensatory sweating.

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From the Thoracic Surgery Division (Al-Tarshibi, Khamash), and the Respiratory Medicine Division (El-Khushman), King Hussein Medical Center, Amman, Jordan.

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Address correspondence and reprint request to: Dr. Mohammad I. Al-Tarshibi, Thoracic Surgery Division, King Hussein Medical Center, PO Box 6926, Amman 11118, Jordan. Tel. +962 (79) 5542420. Fax. +962 (6) 5854566. E-mail: mtarshibi@gmail.com

Primary hyperhidrosis is a condition of idiopathic etiology characterized by abnormal excessive sweating. The most common affected sites are the palms, the axilla, or the face. It is associated with occupational, psychological, and social embarrassment to the affected patients.¹ Medical management is unrewarding, patients usually try many unsuccessful treatment modalities.^{1,2}

Nowadays, interrupting the sympathetic chain is the standard surgical therapeutic procedure, and is the most effective form of management.¹⁻⁴ Before the early 1990's, thoracotomy was the standard surgical approach to perform sympathectomy in patients with hyperhidrosis. This was accompanied by a prolonged recovery period and significant morbidity.³ However, with recent advances in video-assisted thoracoscopic (VAT) surgery, upper thoracic dorsal sympathectomy has emerged as a viable first line treatment for essential hyperhidrosis.¹⁻⁶ In this study, we retrospectively studied the early and late complications, due to VAT sympathectomy at King Hussein Medical Center (KHMC) in Amman, Jordan.

Methods. This retrospective study was conducted at KHMC, Amman, Jordan, between April 2001 and January 2006. All patients who underwent VAT sympathectomy for the treatment of facial, axillary, and/or palmar hyperhidrosis were included in our study. Patients who underwent VAT sympathectomy for other indications other than hyperhidrosis were excluded. Two hundred and seven patients were included in the study. Data were collected from patients' medical records. Direct human subject involvement was not applicable in this study. Although ethical approval was not necessary we had the permission to conduct this analysis from the local ethical committee. The surgery was performed either bilaterally at the same time, or as a 2-stage procedure. All the patients were assessed in the outpatient clinic prior to be scheduled for surgery, to assure that this is primary hyperhidrosis, and to document its site. Any family history of hyperhidrosis, and the presence of other symptoms related to the hyperhidrosis was documented. The patients were admitted prior to surgery in which a complete blood count, coagulation profile, chest x-ray, and preoperative echocardiogram were carried out. All the patients were informed on the possibility of compensatory sweating postoperatively. Single lung ventilation was used to assure complete collapse of the lung with lateral positioning of the patients. Two incisions were used to perform the surgery, the first one is a 10-mm incision, at the fifth intercostal space mid-to-posterior axillary line for the optic instrumentation, while the working channel was carried out at the third intercostal space posterior axillary line using 5-mm incision. The thoracic cavity was viewed, with counting of the upper ribs to assess the level of sympathectomy to be performed, starting from the first rib downwards. The main sympathetic chain was identified, making a pleural window over the chain, and then cauterizing, cutting or clipping the chain over the rib. For facial hyperhidrosis and facial blushing, clipping of the lower third of thoracic (T)1 is performed (stellate ganglion) without cauterization.

For palmar hyperhidrosis cauterizing the chain, or cutting and cauterizing the edges of the chain over the rib at the level of T2 and T3 was performed, while for axillary hyperhidrosis, cauterizing the chain or cutting and cauterizing the edges of the chain at the level of T4 was carried out. Then 12-French pleural catheter was inserted to drain the air, and removed after evacuation of the air on the operating table if the surgery was unilateral, and kept for 24 hours if the surgery was bilateral. Chest x-ray was carried out to assure the full expansion of the lungs, and then the catheter was removed if there was no indication to keep it. All possible complications, reactions or complaints were documented. Follow up was completed for one year for all the patients.

StatsDirect statistical software version 2.6.5 was used to perform the statistical analysis. The student's t-test was used for the statistical study. Continuous variables were expressed as mean±standard deviation, categorical variables were expressed as percentages.

Results. There were 123 males (59.4%) and 84 females (40.6%) included in this study. Age ranged from 13-34

Table 1 - Sites of hyperhidrosis.

Site	n (%)
Palmar	153 (73.9)
Axillary	4 (1.9)
Facial	7 (3.4)
Palmar and axillary	31 (15)
Palmar and facial	8 (3.9)
Palmar, axillary, and facial	4 (1.9)
Total	207 (100)

Table 2 - Recorded surgical complications and reactions related to video-assisted thoracoscopic sympathectomy (N=207).

Complications	n (%)
Pneumothorax	4 (1.9)
Hemothorax	2 (1.0)
Horner's	2 (1.0)
Intercostal neuralgia	6 (2.9)
Breast parasthesia	15 (7.2)
Sensory loss	19 (9.2)
Compensatory sweating	142 (68.6)
Dry facial skin	11 (5.3)
dandruff	5 (2.4)
Dry hands	41 (19.9)
Phantom sweating	2 (1.0)
Gustatory sweating	9 (4.3)
Acute psychosis	1 (0.5)
Recurrence	3 (1.4)

years (mean 25.2±4.6). One hundred and eighty-nine patients (91.3%) had life long symptoms, while 18 patients (8.7%) developed the symptoms later in life, of which the duration were 6.9±3.4 years. One hundred and sixteen patients had a positive family history in the first-degree relatives (56%), and 139 patients (67.1%) had associated symptoms. From these patients who had associated symptoms, 46 (22.2%) had palpitations, 11 (5.3%) had social phobia, and 82 (39.6%) had tremor. The most common indication for sympathectomy was palmar hyperhidrosis (73.9%). Other sites are shown in Table 1. The complications related to surgery were divided into 2 groups, either surgical complications, or post sympathectomy reactions. Table 2 summarizes the recorded surgical complications, and reactions related to video-assisted thoracoscopic sympathectomy.

Discussion. The first reported operation according to Schmidt et al,⁴ on the upper sympathetic system was performed by Alexander in 1889. During the last century, the technique of sympathectomy has been changed, from the open to thoracoscopic approach, and from complete resection of ganglia to sympathetic chain interruption, either by cauterization, cutting or clipping the chain.^{4,6-15} Although an empirical treatment, VAT sympathectomy is a well-established treatment modality for primary hyperhidrosis. The main indications for VAT sympathectomy are palmar, axillary hyperhidrosis, and facial blushing.^{4,6-8} The results of VAT sympathectomy are unpredictable, and may vary between patients.⁶ It may be argued that thoracoscopic sympathectomy for hyperhidrosis is merely a cosmetic procedure, however, many researchers indicate that most patients who seek surgical therapy are very disabled by their symptoms, both professionally, and socially.^{1,10} In this study, we recorded all possible postoperative complications, and all early and late reactions related to sympathectomy.

All of our patients were from the young age group in their productive period of life, having social embarrassment due to the hyperhidrosis with a male predominance, which is different from other researchers who showed female predominance such as Dewey et al,² Doolabh et al,³ and Schmidt et al.⁴ The reason for this was that, our study was conducted in a military hospital with most of the medically ensured patients who are working in the army are males. Most of the patients had a long history before seeking surgical attention. Even the history is life long with a positive family history reported in almost half of the cases. Most of the cases who underwent sympathectomy suffered from palmar hyperhidrosis mainly, and is this comparable to many other studies.^{1-3,6,10,11} The surgery was performed either bilaterally at the same time, or as a 2-stage procedure. The reason for performing the sympathectomy in a

2-stage procedure at times was related to the patient's desire, and personal fear of uncertainty of the results. The recorded complications were either related to the surgery itself, or post sympathectomy reactions. Regarding the surgical complications, none of them were life threatening. Pneumothorax occurred in 1.9%, and hemothorax in 1% of cases, both of these complications were treated by thoracostomy tube, and these complications were reported by many other researchers in a comparable rate such as Dumont et al⁶ Kwong et al.⁹ We reported 2 cases of Horner's syndrome detected in the first postoperative day, both of them underwent sympathectomy at the lower third of T1 and upper T2, one of them had a complete recovery later. This is comparable to the results of Dewey et al² who reported one case of Horner's syndrome in 222 cases who underwent sympathectomy, and to the results of Kwong et al,⁹ who reported 2 cases of Horner's syndrome in his series of 397 patients who underwent sympathectomy. Conversely, Lin¹⁴ reported no Horner's syndrome in his 42 patients. We suggest to avoid using the electrocautery near the T1 level, and instead use the endoclip to clip the lower third of T1. Intercostal neuralgia, breast paresthesia, and transient sensory loss over the medial aspect of the arm were temporary complications, and all these complications disappeared in 6 months. The cause of these complications is attributed to the instruments and lens manipulation through the trocars. Reducing this percentage can be achieved by using 5 mm trocars, rather than the conventional 10 mm trocars and lens. Schmidt et al⁴ reported a 2.7% of intercostal neuralgia, which is comparable to our results. The most common complications were the reactions related to the sympathectomy, as documented also by many other researchers, of which compensatory sweating was the most common.^{1-6,9,12-15} Our results regarding compensatory sweating were comparable to many researchers such Zacherl et al,⁵ Lin,¹⁴ Gossot et al,¹⁶ and Hsia et al,¹⁷ and Although the compensatory sweating was minor in most cases, 6 patients had a severe sweating in the chest, abdomen, back or buttocks, and regretted undergoing the procedure. Lee et al,¹⁸ performed selective T3 ramicotomy (selective division of T3 rami communicantes) rather than sympathectomy for palmar hyperhidrosis. His study showed that the compensatory sweating rate was lower when compared to the traditional sympathectomy procedure.¹⁸ Dry hands, dry facial skin, and dandruff were an expected reaction post sympathectomy, with many patients needing the use of emollients, although none of them showed any regret for carrying out the procedure, and this is comparable to the results of Dumont et al.⁶ Gustatory sweating were reported after

eating hot and spicy foods, all of the patients with this complaint underwent T2 and T3 sympathectomy for palmar hyperhidrosis, and this is also comparable to the results reported by many researchers.^{1,3,6} One case developed acute psychosis (0.5%) post sympathectomy, and were referred to a specialized psychiatric center. We did not find in the literature any documentation of a similar complication, although we cannot assure if this was related to the procedure or not. Recurrence occurred in 3 patients with cases that required repeating the procedure, and this is an acceptable result as compared to other series.^{2-4,9,10,14} Two of the 3 cases of recurrence were found to have a small more lateral accessory branch from the sympathetic chain that was not transected during the original surgery. Although the study included 207 patients, we think that a larger number of patients might be necessary to define more clearly the complications of this procedure. No similar national or regional data could be found for further comparison.

In conclusion, compensatory sweating remains the most common, and most disabling complication of VAT sympathectomy for primary hyperhidrosis, and every patient should be informed of its possibility. We suggest investigating other alternative more selective methods, rather than cutting the main trunk, such as ramicotomy, which should be studied more thoroughly to assess its efficacy in reducing the complication of compensatory sweating.

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