Evaluation of VATS Sympathetic Cauterization in Treatment of Hyperhidrosis, Experience with 125 Cases

Tamer Hamdy EzEldin, M.D.

**Background:** Primary Hyperhidrosis is idiopathic excessive sweating can cause significant professional and social handicaps. Although treatments such as oral medications, Botox, and iontophoresis are available, surgical sympathectomy is being increasingly utilized.

**Methods:** Between December 2009 and January 2012, 125 patients with palmar, axillary, facial, or plantar hyperhidrosis underwent a thoracoscopic sympathectomy in Alhada military hospital. Surgical technique was performed for them included cauterization of the sympathetic ganglia at T2, T3, and/or T4 depending on the location of the sweating, using monopolar cautery. A retrospective study was done to evaluate the results of the VATS sympathectomy for those patients.

**Results:** All patients were males, data were collected after approval of the ethical committee, mortality was 0%, recurrence was 1.6%, dry facial skin was 10.4%, compensatory sweating was 88.8%, sensory loss was 17.6%, breast parathesia was 8%, intercostal neuralgia was 9.6%, hemothorax was 2% and pneumothorax was 2.4%, patients’ satisfaction showed significant difference between the pre and postoperative symptoms on the sweating satisfaction scale.

**Conclusion:** VATS sympathectomy is a very safe maneuver for treatment of primary hyperhidrosis, it gives satisfactory results and accepted controllable complications.

**KEY WARDS:** Hyperhidrosis, VATS, Sympathectomy

Primary hyperhidrosis is an idiopathic excessive localized sweating not related to physiologic requirements of the body with a reported incidence of approximately 1% of the population. Palms, feet, axilla, scalp and face are the most commonly affected areas. It is also associated with severe noncontiguous flushing of the head and neck. Sometimes it is associated with abnormal respiration. (1)

Secondary hyperhidrosis usually manifested by increase total body sweating as a part of the manifestations of systemic disease such as hyperthyroidism, lymphoma, pheochromocytoma or central nervous system abnormalities. Hyperhidrosis usually begin in childhood or adolescence often representing an incapacitating and embarrassing disorder that can interfere with social and professional activities. (2)

Non-surgical treatment for hyperhidrosis, includes topical antiperspirants, orally administered anticholinergic medication which may partially block the transmission of nerve impulses to sweat glands, or iontophoresis, which uses water and a very mild electrical current to microscopically thicken the outer layer of the skin. (3)

Surgical management for hyperhidrosis started with an operation required an open thoracotomy. This was accompanied by a prolonged recovery period and significant morbidity. With recent advances in video assisted thoracoscopic upper thoracic dorsal sympathectomy has emerged as one of the preferable lines for management of primary hyperhidrosis. (4)
Experience over time decreased the incidence and severity of complications following treatment with video assisted thoracoscopy. (5)

This study is a retrospective descriptive review of 125 patients underwent thoracoscopic dorsal sympathectomy in Alhada military hospital to analyze the results and experience with this modality of treatment for primary hyperhidrosis.

Patients and Methods

All operations were performed in Alhada military hospital, after taking written consents from all patients. The operations were performed under general anesthesia with double lumen endotracheal intubation so that the lung on the operative side can be deflated, patients were put in supine position with extended arms.

The sequences of operations that had been done for all patients were as follow; three separate 5mm incisions made along the inframammary fold. We usually started by operating the right side first. Three sealed thoracoscopic ports were placed; carbon dioxide (CO2) insufflation to less than 8mmHg of pressure was used routinely to improve exposure of the dorsal sympathetic trunk. The pleural space was then inspected using a 0 degree 5mm endoscope. The intercostal spaces and corresponding segments of the sympathetic chain then visualized and the overlying parietal pleura incised using monopolar cautery. The sympathetic ganglia at T2, T3 and/or T4 were isolated and individually cauterized except in fourteen patients in whom only T3 was cauterized as they complained from isolated palmer hyperhidrosis. In general T2 usually cauterized for patients with facial and scalp symptoms, T3 ganglion for palmar hyperhidrosis and the T4 ganglion for patients with axillary hyperhidrosis.

Hemostasis is then obtained and air was evacuated from the pleural space through a small bore catheter as the ports were removed so, usually chest tube insertion was unnecessary. After securing the right side, the procedure is then repeated on the left side.

At the end of the procedure a chest roentgenogram was then obtained. The patients were observed in the recovery area routinely and then discharged to regular beds within one to two hours.

Data Collection

Clinical data were reviewed and collected for all patients from data base of the hospital after approval of the ethical comity off ALHADA MILITARY HOSPITAL, including demographic data, family, history; duration and severity of symptoms which based on a scale from 0 to 10 considering ten as very severe symptoms. Post-operative results and complications were picked up from follow up sheets and progress notes, patient followed-up throughout the outpatient clinic files over the following 6 months post discharge from the hospital to assess early and late operative outcome.

Results

125 patients were operated between December 2009 and January 2012 in ALHADA Military Hospital for hyperhidrosis, all patients were males. Table (1) Fourteen patients (11.2%) were complaining from isolated palmer hyperhidrosis, 58.4% were complaining from palm & axilla while 8.8% were axillary hyperhidrosis. 1.6% were scalp and palms, 4% were face and scalp, 0.8% were scalp and axilla, while 15.2% were complaining from hyperhidrosis of all the above. Table (2)

<table>
<thead>
<tr>
<th>Table (1) Patients’ demographic characteristics</th>
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<tbody>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Life long</td>
</tr>
<tr>
<td>Not of life long</td>
</tr>
<tr>
<td>Topical agent</td>
</tr>
<tr>
<td>Botox</td>
</tr>
<tr>
<td>Beta Blockers</td>
</tr>
<tr>
<td>Anticholinergic</td>
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</tbody>
</table>

Table (2): Body area affected

72% of patient their complains started early in life, while 28% their symptom started under the age of twenty, 68% of patient suffered from extreme sweating episodes during daily activity, 72% only during emotional situations, 100% of them during exercise and only 24% during sleep. Table (3)

<table>
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<tr>
<th>Table (3) Episodes Extreme Sweating</th>
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<tbody>
<tr>
<td>Daily Activity</td>
</tr>
<tr>
<td>Emotional Situations</td>
</tr>
<tr>
<td>Exercise</td>
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<tr>
<td>Sleep</td>
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24% of the patients treated by Botox before surgery but the results were unsatisfactory for them, 3% treated by Beta-blockers, 10% by topical agents and only one of them tried anticholinergics to relieve the symptoms. All patients were prepared and scheduled for surgery on elective base from outpatient clinic. There were no deaths or major intraoperative complications.

In ninety patients there was no need for insertion of intercostal tube postoperatively. In 35 patients insertion of intercostal drainage tube was needed because of bleeding from the intercostal veins. The tubes were removed in the 2nd postoperative day, only in one patient the intercostal tube remained for 3 days as the lung was not fully inflated after surgery.

In three patients reinsertion of intercostal tube was needed for pneumothorax that discovered after removal of the chest drain. Two patients developed hemothorax and intercostal tube reinserted for 3 to 5 days until drainage was stopped and chest x-ray showed free costophrenic angles and inflated lungs.

Twelve patients complained from intercostal neuralgia, in three of them pain disappeared on the 7th postoperative day, two were in need of strong analgesic and intercostal nerve block twice before disappearance of pain, and in 7 of them pain was insignificant and disappeared on the 3rd postoperative day. Ten patients complained from breast paresthesia which disappeared within 6 to 8 weeks without medications except for one of them who needed reassurance and medical treatment in the form of anticholinergics to relief the symptoms. All patients were prepared and scheduled for surgery on elective base from outpatient clinic. There were no deaths or major intraoperative complications.

Patients were asked to evaluate their satisfaction with the procedure on a scale from 0 to 10, with 10 being the highest degree of satisfaction.

This was then converted to a satisfaction rating based on patient’s response as following; scores 0-2 classified as very unsatisfied, 3-7 as satisfied and 8-10 as very satisfied. Preoperative assessments of the sweating severity in their affected areas were compared with the postoperative satisfaction on the same scale of 0 to 10 and showed significant improvement. Table (5)

<table>
<thead>
<tr>
<th>Presenting Symptoms</th>
<th>Pre-OP Severity Score (0-10 scale)</th>
<th>Post OP Severity Score (0-10 scale)</th>
<th>Change in Score</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palms</td>
<td>9</td>
<td>1</td>
<td>8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Axilla</td>
<td>8,7</td>
<td>2,1</td>
<td>6,6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Face/Scalp</td>
<td>7,5</td>
<td>3,1</td>
<td>4,4</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table (5) Patients' satisfaction

Discussion

The sympathetic trunk can be easily identified through the parietal pleura thoracoscopically and surgical division of the trunk can be safely performed with minimal associated morbidity.

88.8% of our patient experienced compensatory hyperhidrosis which usually affecting the upper abdomen, lower back, inner thigh and behind the knee. Similar studies reported variable range of occurrence of compensatory hyperhidrosis; de-Campos et al.,(6) Licht,(9) Lin et al.,(10) Licht et al.,(10) and Licht et al.,(10) reported 100% while Cameron,(11) study showed zero percent.

Some theories explained that compensatory sweating is a thermoregulatory mechanism by which the sweat gland attempt to compensate for the decreased amount of secretory tissue. Many authors felt that compensatory symptoms could be reduced or eliminated by limiting the extent of sympathetic nerve excision, while others claimed that these symptoms can be correlated to both the level and the extent of resection.(12)

It is noticed that there is a relation between the number of levels excised and the degree of compensatory hyperhidrosis as we did only T3 resection for fourteen patients (11.2%) those were complaining from isolated palmer hyperhidrosis and they did not complain from compensatory hyperhidrosis while in the other patients we did resection for T2, T3 and T4. For the same reason Lin et al.,(13) recommend limitation for the extent of resections for hyperhidrosis to a single level if possible in order to reduce the incidence of severe compensatory hyperhidrosis.

In this study; all patients were young age males in their productive period of life. 96% of them had social embarrassment due to hyperhidrosis. Other researchers as Wolosker et al.,(14)
and Milanez et al.,(16) showed female predominance. Our study was conducted in a military hospital with most of the medically ensured patients are males working in the army. Also, because of social attitude of the male predominant community where males are more and freely presented than females, this study included 100% male patients.

Most of cases had long history before seeking surgical attention and 38% of them received other modality of treatment but they were unsatisfied. We did not report Horner’s syndrome in any case in this study, while it was reported in most of other studies with low incidence rate ranged from one to two cases like Gossot et al.,(18) who reported two cases and Dewey et al.,(17) who reported one case out of two hundred and twenty two cases. In this study, cautерization was not used much near T1 level to avoid such complication.

Intercostal neuralgia, breast paresthesia and transient sensory loss were time limited complications that disappeared within 3 to 6 months. Zacherl et al.,(18) and Gossot et al.,(19) reported similar percentages for these complications like this study.

In this study, 13 patients complained of dry facial skin which treated by local moisture cream and this complain disappeared after 2 months of treatment.

Two cases complained of recurrence, and this was because of over precaution not to burn T1 ganglia in order to avoid Horner syndrome. One underwent redo surgery on the left side and he developed satisfaction after that, the other patient refused to redo surgery and he tried another line of medical treatment (Botox).

Conclusion

VAT sympathectomy is a very safe maneuver for treatment of primary hyperhidrosis and it gives satisfactory results with accepted controllable complications which are not life threatening.

REFERENCES