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THORACOSCOPIC SURGERY OF PALMAR HYPERHIDROSIS: SEQUELAE AND COMPLICATIONS.

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Twenty patients with primary palmar hyperhidrosis were selected for bilateral thoracoscopic electrocautery of the sympathetic chain. Five out of the 20 patients had as well, axillary hyperhidrosis. The second and third thoracic ganglia were electrocoagulated and in patients associated with axillary hyperhidrosis, the fourth thoracic ganglion was also coagulated. The procedure was successfully completed bilaterally in 17 patients (85%). Unilateral failure to identify the sympathetic chain occurred in 3 patients (15%) which required conversion to open surgery on these limbs. The mean operative time for each limb was 37 minutes. The mean postoperative hospital stay was 2.5 days and the patients resumed normal activity within 10 days postoperatively. Chest pain was the commonest postoperative complaint. It was usually relieved by a single dose of opiates given during hospital stay; however, 3 patients (15%) needed oral analgesics after hospital discharge for a mean period of 4 days. Complications in our study were few and mild: unilateral pneumothorax occurred in 2 patients (10%), unilateral hemothorax and transient Horner's syndrome occurred in 1 patient (5%). Burst of palmar sweating for some hours, during the first postoperative week, occurred in 3 patients (15%). Mild compensatory hyperhidrosis and gustatory sweating occurred in 6 patients (30%) and 2 patients (10%) respectively and they did not cause discomfort to our patients. Unilateral moderate recurrence of hyperhidrosis occurred in one patient (5%) after 4 months and he refused any more surgical interference. Some of our patients, who had plantar hyperhidrosis as well, noticed postoperative decrease of their feet sweating.

The thoracoscopic approach for palmar hyperhidrosis seems to offer the ideal surgical solution with excellent results, minimal complications, short hospital stay and early recovery.

Key words: *Palmar hyperhidrosis, thoracoscopic, electrocoagulation.*

INTRODUCTION

Primary palmar hyperhidrosis is excessive sweating beyond physiological needs in the palms without recognized etiology. Though not life threatening, it is annoying to most patients[1]

Medical treatment may improve the condition in mild cases; however, the definitive and final treatment in most cases of palmar hyperhidrosis is upper thoracic sympathectomy via many different approaches. Among these approaches, endoscopy has been recommended as a minimally invasive procedure and used increasingly[2,3,4].

The aim of this work is to evaluate our early experience in treating 20 patients with primary palmar hyperhidrosis with bilateral endoscopic electrocautery of the upper thoracic sympathetic chain.

PATIENTS AND METHODS

This study was conducted on 20 patients with primary palmar hyperhidrosis in Kasr El Eini and some private hospitals during the period from May 1997 till April 1999. Five out of the 20 patients *(25%)* had as well axillary hyperhidrosis. They were 12 males and 8 females and their ages ranged between 22 and 38 years with a mean of 27.5 years.

Thorough medical examination and investigations were done to exclude cases of secondary hyperhidrosis due to underlying systemic diseases as thyrotoxicosis, diabetes mellitus, pheochromocytoma and carcinoid tumors. Chest x-ray was done to exclude cases with underlying lung diseases that might be associated with extensive pleural cavity adhesions.

Operative technique (Fig. 1 A, B, C &D): It was nearly similar to that reported by many authors [3,4,5].

- Under single lung anesthesia, the patient was placed in the lateral decubitus position with the arm hyperabducted.

- A veress needle was inserted in the fourth intercostal space in the midaxillary line and the pleural space was insufflated with about one liter of CO_2 to collapse the lung. Through the same site a 10 mm trocar was introduced into the pleural space where a 10 mm thoracoscope was inserted.

- A second 10 mm and a third 5 mm trocars were introduced into the fourth intercostal space in the posterior and anterior axillary lines respectively. Through these parts, the parietal pleura overlying the sympathetic chain was incised using coagulating microscissors. The second and third thoracic ganglia over the ribs were then electrocoagulated. In cases associated with axillary hyperhidrosis, the fourth thoracic ganglion was also coagulated. In only 2 patients (10%), a fourth port (5 mm) was introduced into the sixth intercostal space below the thoracoscopic port where a blunt tipped probe was used to retract the lung during exposure and electrocautery of the sympathetic chain. After finishing the procedure the lung was reinflated under direct vision. Chest drains were unnecessary and not routinely inserted.

- The same procedure was repeated on the opposite side.

Follow up by x-ray chest was done on admission to the recovery room to assure complete lung inflation.

Usually patients were discharged on the second postoperative day and were followed regularly for 8 months.

RESULTS

Successful surgery with immediate postoperative dry warm hands was achieved in 17 out of the 20 patients *(85%).* Unilateral failure to identify the sympathetic chain occurred in 3 patients *(15%).* This technical failure was due to extensive pleural adhesions in one case and marked subpleural fat in two obese cases. It required conversion to open transaxillary surgery on these limbs.

The operative time for each limb ranged between 30 and 85 minutes with a mean of 37 minutes. The postoperative hospital stay ranged between 2 and 7 days with a mean of 2.5 days and the patients resumed normal activity within 10 days.

The most frequent postoperative complaint was self-limited pain over the anterior chest and upper back; initially severe but of short duration (1 to 3 hours). It was usually relieved by a single dose of opiates given during hospital stay, however, 3 patients (15%) needed oral analgesics after hospital discharge for a period that ranged between 2 and 7 days with a mean of 4 days.

Complications that occurred in our study were not serious or fatal. Unilateral pneumothorax occurred in 2 patients (10%) with spontaneous resolution within 24 hours. Unilateral hemothorax occurred in one patient (5%) and was treated with a chest tube for 3 days and did not require blood transfusion. Unilateral transient Horner's syndrome occurred in one patient (5%) and disappeared spontaneously one week after the operation.

Three patients (15%) experienced a short burst of palmar sweating lasting for some hours during the first postoperative week only.

Table (1): ***Sequelae and complications of thoracoscopic upper dorsal sympathectomy in palmar hyperhidrosis:***

Sequelae and complications	***No. of patients (%)***
Successful surgery	17(85%)
Unilateral technical failur	3(15%)
Unilateral pneumothorax	2(10%)
Unilateral hemothorax	1(5%)
Unilateral Horner's syndrome	1(5%)
Temporary burst of palmar sweating	3(15%)
Compensatory hyperhiderosis	6(30%)
Gustatory sweating	2(10%)
Unilateral recurrence	1(5%)

Mild compensatory hyperhidrosis on the trunk, buttocks and thighs occurred in 6 patients (30%) and was improved by time. Gustatory sweating, feeling of hand sweating on eating without actual sweating, occurred in 2 patients (10%).

Unilateral moderate recurrence of hyperhidrosis occurred in one patient (5%) on the left side. It occurred after 4 months and the patient refused any more surgical interference.

Many patients with palmar hyperhidrosis in our study had plantar hyperhidrosis as well and though the operation was directed to the upper extremities, some of them noticed postoperative decrease of their feet sweating.

Fig. (1A):Diagram showing sites of trocars insertion during left thoracoscopic dorsal smpathectomy

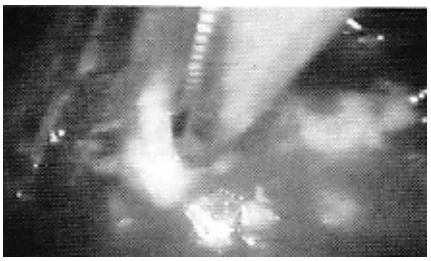

Fig. (1B):Thoracoscopic operative view showing identification of the left sympathetic chain

Fig. (1C):Thoracoscopic view showing dissection of the left sympathetic chain

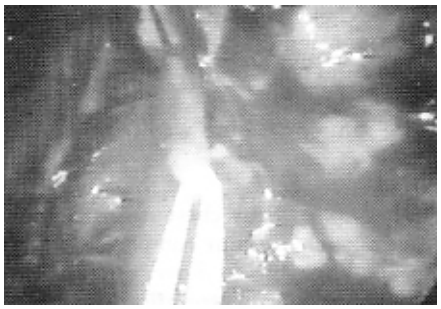

Fig. (1D):Thoracoscopic view showing electrocautery of the left sympathetic chain.

DISCUSSION

Primary hyperhidrosis is excessive sweating of unknown aetiology that affects mainly the hands, feet and axilla. Not only does it cause psychological and social problems, but it may also result in occupational and educational difficulties [2].

The results of percutaneous alcohol or phenol injection by computed tomography guidance to destroy the sympathetic ganglia in hyperhidrosis were discouraging [6]. Percutaneous radiofrequency destruction or stereotactic thermocoagulation for the ganglia, were also unreliable [7,8]

Conservative medical treatment regimens are usually ineffective. Anticholinergic drugs have unpleasant side effects and iontophoresis is impractical. Conventional open surgical sympathectomy, with its different approaches, is effective; but the magnitude of the procedure with its complications, the extended hospital stay and long convalescence have restricted its use [9].

By introducing a minimally invasive technique through a thoracoscopic approach, it is now possible to offer patients with upper limb hyperhidrosis an easy, safe and quite inexpensive operation with a definite cure [5].

In our study, successful surgery with immediate postoperative dry warm hands was achieved in 17 out of 20 patients (85%). The mean operative time for each limb was 37 minutes, the mean postoperative hospital stay was 2.5 days and our patients were able to resume normal activity within 10 days postoperatively. Our results were comparable to those reported by Cloes and Gothberg who showed a success rate of 93% and a mean postoperative hospital stay of 2.7 days[3]. Our mean operative time (37 minutes) was relatively longer than that reported by Olcott et al. (25 minutes). However, this work represented our early experience (20 patients) in comparison to 320 patients performed by Olcott and his colleagues [10].

Chest pain or discomfort was the commonest postoperative complaint in this study and in others. This might be due to intrapleural CO_2 insufflation or due to multiple thoracic trocars insertion[2]. To avoid this unpleasant symptom, many authors performed thoracoscopic sympathectomy using double lumen endotracheal tube to ensure unilateral lung collapse without intrapleural CO_2 insuffiation[11]. Others described thoracoscopic sympathectomy using one port only applied in the first intercostal space in the midclavicular line and through this port the electroresectoscope is introduced to coagulate the thoracic ganglia [5].

Complications in our study were few and mild. Unilateral pneumothorax occurred in 2 patients (10%) and resolution occurred spontaneously. Unilateral hemothorax occurred in 1 patient (5%) and was treated with a chest tube for 3 days. Unilateral transient Horner's syndrome occurred in one patient (5%), it was mild in the form of ptosis only and disappeared one week after the operation. This last sequela might occur due to inadversely heat transmission to the stellate ganglion during electrocautery of the second and third thoracic ganglia. High rate of sequelea and complications had been reported by many authors when thoracoscopic resection of the sympathetic chain was done for the hyperhidrosis and not cauterization as we did. However resection allows histopathological confirmation that sympathectomy has indeed been performed and it prevents regrowth of the nerve fibers [12].

During the first postoperative week, 3 patients (15%) experienced a short burst of palmar sweating lasting for some hours. This might represent a transient discharge of the transmitter substance at the nerve endings resulting from the post-ganglionic degeneration. Adar[9] noticed this sequela in his patients and noted that it is important to forewarn the patients of the possibility of this sequela before discharging them from the hospital, otherwise they will fear that the operation has failed.

Some of patients in our study who had plantar hyperhidrosis as well, noticed postoperative decrease of their feet sweating. This had been noted by others and remained unexplained [13].

Compensatory sweating occurred on the trunk, buttocks and thighs in 6 patients (30%). It was mild, improved by time and caused no discomfort to our patients. The incidence of compensatory sweating in this study was nearly comparable to that reported by Edmonson and his colleagues [14]. The mechanism of this phenomenon is not exactly known, but most probably it represents a compensatory thermoregulatory mechanism[13]. Gustatory sweating occurred in 2 patients (10%). It is most probably a manifestation of residual sympathetic activity[1]. This complaint was a minor nuisance to our patients in comparison to their original complaint.

Moderate recurrence of hyperhidrosis occurred in one patient (5%) on the left upper limb, after 4 months and he refused any further surgical interference as his dominant hand remained dry. Hederman[15] who followed his patients for 2 years reported recurrence in 5.3%. He noted that the nerve of Kuntz which lies lateral to the sympathetic chain is present in about 10% of patients and must be coagulated, otherwise the denervation of the upper extremity is incomplete resulting in either incomplete postoperative dry hands or recurrence later on.

The results of our study support the opinion that the thoracoscopic surgery for palmar hyperhidrosis is a simple, safe and effective procedure and is competitive with the open approach. However, a point of interest in our future studies will be to compare thoracoscopic resection with thoracoscopic cautery of the sympathetic chain for treating upper limb hyperhidrosis.

REFERENCES

1. Kux, M.: Thoracic endoscopic sympathectomy in palmar and axillary hyperhidrosis. Arch. Surg. 1998, 113:264-66.

2. Moran, K.T. and Brady, M.P.: Surgical management of primary hyperhidrosis. Br. J. Surg. 1991, 78:279-83.

3. Cloes, G. and Gothberg, G.: Endoscopic transthoracic electrocautery of the sympathetic chain for palmar and axillary hyperhidrosis. Br. J. Surg. 1998, 78:760-64.

4. Cameron, A.: Endoscopic transthoracic electrocautery of the sympathetic chain for palmar and axillary hyperhidrosis. Br. J. Surg.1991, 78:252.

5. Cloes, G.; Drott, C. and Gothberg, G.: Endoscopic electrocautery of the thoracic sympathetic chain. A minimally invasive way to treat palmar hyperhidrosis. Scand. J. Plast. Reconstr. Hand Surg. 1993, 27:29-33.

6. Adler, O.B.; Engel, A.; Rosenberger, A. and Dondelinger, R.: Palmar hyperhidrosis. CT guided chemical percutaneous thoracic sympathectomy. Fortschr Rontgenstr 1990, 153:400-403.

7. Wilkinson, H.A.: Percutaneous radiofrequency upper thoracic sympathectomy: a new technique. Neurosurg. 1984, 15:811-14.

8. Chuang, K.S.; Liou, N.H. and Liu, J.C.: New stereotactic technique for percutaneous thermocoagulation of upper thoracic ganglia in cases of palmar hyperhidrosis. Neurosurgery 1988, 22:600-604.

9. Adar, R.: Surgical treatment of palmar hyperhidrosis before thoracoscopy: Experience with 475 patients. Eur. J. Surg. 1994, 572:9-11.

10. Olcott, C.; Eltherigton, L.; Wilcocksy, B.; Shoor, P.; Zimmerman, J. and Fogarty, T.: Reflex sympathetic dystrophy. The surgeon's role in management. J. Vasc. Surg. 1991, 14:488-95.

11. Chandler, K.E.: Video thoracoscopic dorsal sympathectomy. A new approach. Surg. Lap. Endos. 1993, 3:112-14.

12. Hashmonai, M.; Kopelman, D. and Schein, M.: Thoracoscopic versus open supraclavicular upper dorsal sympathectomy. A prospective randomised trial. Eur. J. Surg. 1994, 572:13-16.

13. Adar, R.: Compensatory sweating after upper dorsal sympathectomy. J. Neurosurg. 1997, 51:424-25.

14. Edmonson, R.A.; Banerjee, A.K. and Rennie, J.A.: Endoscopic transthoracic sympathectomy in the treatment of hyperhidrosis. Ann. Surg. 1992, 3:289-93.

15. Hederman, W.P.: Present and future trends in thoracoscopic sympathectomy. Eur. J. Surg. 1994, 572:17-19.