Thoracoscopic sympathectomy for palmar hyperhidrosis: Hong Kong early experience

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With recent advances in minimally invasive surgery, many thoracic procedures can now be performed via the video-assisted thoracoscopic approach, which is ideally suited for upper thoracic sympathectomy. From August 1992 to January 1995, 29 sympathectomies were performed at our unit on 15 patients suffering from palmar hyperhidrosis. Sympathetic chains with T2 and T3 ganglia were excised using an endoscopic diathermy hook. There were 10 women and 5 men with a mean age of 22 years (range, 17-31 years). The mean operating time for bilateral sympathectomy was 64 minutes (range, 40-95 minutes). All patients had dry hands and none developed Horner's syndrome. Mean post-operative hospital stay was 2.0 days (range, 1-4 days). Video-assisted thoracoscopy is the approach of choice for upper thoracic sympathectomy. Patients suffering from palmar hyperhidrosis can now be offered a safe and effective operation.

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Introduction

Recent advances in minimally invasive surgery have led to a rapid development of video-assisted thoracoscopic surgery (VATS). Many VATS procedures have now been successfully performed, including pleurodesis for spontaneous pneumothorax, lung biopsy, and excision of benign mediastinal tumours.[1] The VATS approach is ideally suited for thoracic sympathectomy and has become the procedure of choice in centres having the appropriate skills and facilities.[2-6] Complications normally associated with the conventional approach can be avoided with VATS, because of the superior view achieved with the video-telescope system. We report our early experience of VATS sympathectomy for palmar hyperhidrosis.

Subjects and methods

We performed our first thoracoscopic sympathectomy in August 1992. Since then, a further 14 patients have been referred for the surgical treatment of palmar hyperhidrosis. All patients suffered from excessive palmar sweating that affected their daily routine work to such an extent that they sought medical advice. Pre-operative investigations included chest X-ray and lung function tests.

Operative technique

General anaesthesia with double lumen intubation is used. The patient is placed in the lateral position and prepared in the same manner as for postero-lateral thoracotomy. After the ipsilateral lung has been collapsed by clamping the appropriate side of the endotracheal tube, a 10 mm blunt thoracic trocar is inserted into the fifth or sixth intercostal space at the anterior axillary line. The surgeon stands on the opposite side—on the table's left if operating on the patient's right. The pleural cavity is inspected with a 10 mm video-telescope (Solos, Birtcher Medical Systems, California, US).

The sympathetic chain can be easily identified lying along the necks of the ribs in the extrapleural space (Fig 1). Two further 5 mm trocars are inserted in the posterior axillary line, some 10 cm apart. The parietal pleura along the sympathectomy chain from the second to the fourth rib is incised with a 5 mm endoscopic diathermy hook (Solos, Birtcher Medical Systems,

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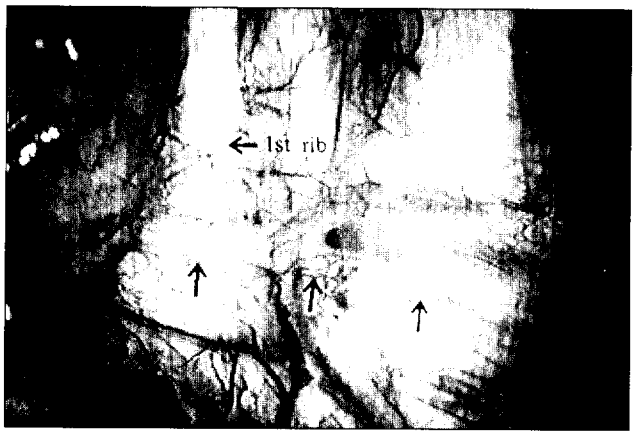

Fig 1. Thoracic sympathetic chain (arrow) can be identified lying along the necks of the ribs

Fig 2. Sympathetic chain being dissected off the chest wall

California, US). The chain on the second rib is freed, lifted with the hook, and divided with endoscopic scissors. The distal, cut end of the chain is picked up by a 5 mm endoscopic grasper and the chain with its ganglia dissected off from the chest wall is picked up with scissors or a hook (Fig 2). It is important to stay close to the sympathetic nerve during this dissection to avoid injury to the intercostal veins that lie just superficial to the chain.

In our early cases, the sympathetic chain with T2 to T4 ganglia were excised. We now find, however, that excision of the T2 and T3 ganglia is sufficient to control palmar hyperhidrosis and this also helps minimise the complication of compensatory sweating. A chest drain is inserted, and the patient is turned over for operation on the other side.

Post-operative management

A chest X-ray is taken to confirm re-expansion of the lungs. In our early cases, we left the chest drains in for at least one day, but we now remove these in the operating theatre once the lungs have been fully re-expanded. This modified practice reduces post-operative discomfort and permits earlier patient discharge.

Results

From August 1992 to January 1995, 29 sympathectomies were performed in 15 patients (10 women, 5 men). The first patient had a right thoracoscopic sympathectomy followed by a left sympathectomy, two months later. One patient had a right thoracoscopic sympathectomy performed at another hospital and developed lung injury that necessitated a hospital stay of more than one week. He was referred to our unit for surgery on the left side, which was completed without complication. The remaining 13 patients underwent bilateral sympathectomy. Their mean age was 22 years (range, 17-31 years). The mean operating time for bilateral sympathectomy was 64 minutes (range, 40-95 minutes) and that for unilateral sympathectomy, 27 minutes (range, 20-30 minutes).

We did not encounter any peri-operative problems in our 15 patients, and there was no conversion to open procedure. In our experience, the majority of patients had central chest pain immediately after recovery from the general anaesthesia, which frequently required parenteral analgesia. However, electrocardiography results were unremarkable. After this initial phase, most patients were pain-free or complained of minor wound pain only that required occasional oral analgesia. All patients had complete lung re-expansion on the operative day. No Horner's syndrome occurred in this series. The mean post-operative stay was two days (range, 1-4 days). All patients had dry hands at the time of discharge.

At a follow up of on average, 15.6 months (range, 5-35 months), all patients' hands remained dry. There were three cases of compensatory sweating (20%) affecting the trunk and thighs. However, the degree of compensatory sweating was mild and patients were satisfied with the overall outcome. All operative wounds healed without conspicuous scars.

Discussion

Upper dorsal sympathectomy has long been recognised as a method of treatment for palmar hyperhidrosis and Raynaud's phenomenon. The traditional supraclavicular approach (cervical sympathectomy)[7] has not been popular for benign conditions such as hyperhidrosis because of the incidence of disturbing

Table. Results of recently published reports on thoracoscopic sympathectomy for palmar hyperhidrosis

Authors	No. of patients	Method	Success rate	Complications
Chao, 1993	150	cauterisation	99%	CS* 21.5% no Horner's syndrome
Herbst, 1994	270	T1-4 sympathectomy	98%	CS 67.4% Horner's syndrome 2.5%
Chen, 1994	180	cauterisation T2 ± T3	98%	CS 70% no Horner's syndrome
Kao, 1994	300	laser T2 ablation	96%	CS 50% no Horner's syndrome
Present study	15	T2-3 sympathectomy	100%	CS 20% no Horner's syndrome

* CS compensatory sweating

complications. The incidence of Horner's syndrome in cervical sympathectomy is between 10% to 22%,[8,9] although an incidence as high as 57% has been reported.[10] This lead to the adoption of other surgical approaches, the most popular being the transaxillary approach.[11] Although injury to cervical structures is avoided, there are other problems associated with thoracotomy.[12]

In the past decade, there has been an increased interest in upper dorsal sympathectomy using the endoscopic transthoracic approach.[13] More recently, the advent of video-thoracoscopy, with a better light source, improved optics, and an advanced video-camera system, has enabled even safer sympathectomy because the anatomy can be clearly identified. Complications in VATS sympathectomy are few and the incidence of Horner's syndrome is either very low or absent.[3-6]

Although good results with VATS sympathectomy for palmar hyperhidrosis have been reported with a success rate greater than 95%,[3-6] there have been some failures (Table). In this small series, the success rate was 100%, which can be attributed to the precise removal of the upper dorsal chain, made possible with VATS. In some centres, diathermy cauterisation has been used to treat the sympathetic chain or ganglia, which were not excised. However, additional sympathetic nerve fibres may exist alongside the main trunk and an accessory nerve of Kuntz may arise from the T2 ganglion,[14] which can be missed in cauterisation and limited excision, hence accounting for the failures in some reports.

Another disadvantage of diathermy cauterisation is that it may cause thermal injury to the stellate ganglion, resulting in Horner's syndrome. Physical excision of the sympathetic chain with T2 and T3 ganglia should ablate all normal and accessory connections, and a similar procedure has been used by others with comparable results.[2] In addition, excision sympa-thectomy has the advantage of procuring the excised specimen for pathological examination and confirmation.

We favour the lateral decubitus position for the procedure. The supine position has the advantage that both sides can be operated on with one skin preparation. However, we have found that in this position the lung, even after being fully collapsed, often falls backwards, obscuring the view. An additional port is required for retraction of the lung, although some surgeons have reported using this position without difficulty.[4,6] In these cases, ablation of the sympathetic chain was achieved with laser, which is not readily available at many centres.

The other technical point concerns the telescope. A 5 mm telescope can be used instead of a 10 mm scope so that only 5 mm trocars are required, resulting in smaller wounds. We have used a 5 mm scope in several of our cases without problems. However, the image quality with a 5 mm scope, while adequate, is inferior to that obtained from a 10 mm scope. If any bleeding occurs, the view will become so poor that a further procedure may not be possible. Therefore, we do not recommend its routine use, unless the operator has gained considerable experience with VATS procedures.

Compensatory hidrosis is the most common complication after upper thoracic sympathectomy, with incidences of 21% to 70% having been reported.[4-6,15]

Traditionally, the T2 to T4 ganglia are removed, and now there is evidence that removing the T2 and T3 ganglia is adequate for the control of palmar hyperhidrosis.[2,8,12] Compensatory sweating would be reduced both in incidence and severity in the modified, lesser sympathectomy. We excise the T4 ganglion only if the patient also complains of axillary hyperhidrosis. In general, patients are satisfied with dry hands and accept the slight inconvenience of increased sweating elsewhere on the body. Nevertheless, it is good policy to warn the patient of the possibility of this complication before surgery is undertaken.

Conclusion

Our limited experience has confirmed the findings of other larger series that thoracoscopic sympathectomy is safe and effective for patients with palmar hyperhidrosis. The method offers success with almost no complications. The hospital stay is short and cosmesis is excellent. The reluctance of some of our medical colleagues to refer patients suffering from disturbing palmar hyperhidrosis for surgery is no longer justified.

References

1. Hazelrigg SR, Nunchuck SK, LoCicera III, J. Video-assisted thoracic surgery study group data. Ann Thorac Surg 1993;56:1039-44.
2. Lin CC. Extended thoracoscopic T2-sympathectomy in treatment of hyperhidrosis: experience with 130 consecutive cases. J Laparoendosc Surg 1992;2:1-6.
3. Urschel HC. Dorsal sympathectomy and management of thoracic outlet syndrome with VATS. Ann Thorac Surg 1993;56:717-20.
4. Chen HJ, Shih DY, Fung ST. Transthoracic endoscopic sympathectomy in the treatment of palmar hyperhidrosis. Arch Surg 1994;129:630-3.
5. Herbst F, Plas EG, Fugger R, Fritsch A. Endoscopic thoracic sympathectomy for palmar hyperhidrosis of the upper limb: a critical analysis and long-term results of 480 operations. Ann Surg 1994;220:86-90.
6. Kao MC, Chern SH, Cheng LC, Hsiao YY, Lee YS, Tsai JC. Video thoracoscopic laser sympathectomy for palmar hyperhidrosis. Ann Acad Med Singapore 1994;23:38-42.
7. Telford ED. The technique of sympathectomy. Br J Surg 1935;23:448-50.
8. Little JM, May J. A comparison of supraclavicular and axillary approaches to upper thoracic sympathectomy. Aust NZ J Surg 1975;45:143-6.
9. Kurchin A, Zweig A, Adar R, Mozes M. Upper dorsal sympathectomy for palmar primary hyperhidrosis by the supraclavicular approach. World J Surg 1977;1:667-74.
10. Adar R, Kurchin A, Zweig A, Mozes M. Palmar hyperhidrosis and its surgical treatment: a report of 100 cases. Ann Surg 1977;186:34-41.
11. Atkins MB. Sympathectomy by the axillary approach. Lancet 1954;1:538-9.
12. Palumbo LT, Lulu DJ. Anterior transthoracic upper dorsal sympathectomy: current results. Arch Surg 1966;92:247-57.
13. Drott C, Gothberg G, Claes G. Endoscopic procedures of the upper thoracic sympathetic chain: a review. Arch Surg 1993;128:237-41.
14. Kuntz A. Distribution of the sympathetic rami to the brachial plexus: its relation to sympathectomy affecting the upper extremity. Arch Surg 1927;15:871-7.
15. Chao C, Tsai CT, Hsiao HC, Wu WC, Lee CK. Transaxillary endoscopic sympathectomy: a report of experience in 150 patients with palmar hyperhidrosis. Surg Laparoscopy Endosc 1993;3:365-9.