Rare disease

Single incision thoracoscopic sympathectomy for hyperhidrosis

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Thoracic sympathectomy for hyperhidrosis and vasospastic vascular diseases is a rare method of surgical treatment. Three patients (1 male, 2 female; mean age 27.6; between 25 and 30) with palmar hyperhidrosis and/or axillary and dorsal hyperhidrosis who underwent single port thoracoscopic sympathectomy were analysed for age, sex, time of operation room, intraoperative and postoperative complications and length of hospital stay. Mean operating room time was 70 min (between 30 and 120 min). Mean length of hospital stay was 1 day. No postoperative complications were noted. Single incision laparoscopic surgery for hyperhidrosis is a safe method of treatment and an alternative to laparoscopy.

BACKGROUND

Hyperhidrosis is a disease, characterised with excessive sweating on the dermatome innervated by overactive sympathetic ganglion. Treatment of palmar, axillary and dorsal hyperhidrosis caused by overactivity of the dermatome innervated by the thoracic sympathetic chain can only be achieved with radical surgical procedures.¹ Similarly, in conditions like vasospastic vascular disease (VVD) (ie, Buerger, Raynaud syndrome, etc.) and reflex sympathetic dystrophy, thoracic sympathectomy has benefits, especially for eliminating circulation problems of upper extremity and pain.¹ These kind of diseases can cause serious problems, because they directly affect the patient's public life. Although non-surgical treatments may help some patients with palmar hyperhidrosis, they may not benefit individuals who are severely affected. Sympathectomy has been performed effectively for palmar hyperhidrosis for many years. The endoscopic approach allows good visualisation of the second to the fifth sympathetic ganglia, is relatively simple to perform, and involves less time in hospital, less postoperative pain and scarring and fewer complications. In the recent years, single incision laparoscopic surgery (SILS) has been gaining popularity, especially for general surgical procedures (colorectal, gastrointestinal surgery, cholecystectomy). In this study, our aim was to present the patients with hyperhidrosis who underwent SILS treatment.

CASE PRESENTATION**Patients**

Three patients admitted to our clinic with hyperhidrosis and underwent SILS thoracoscopy between January 2009 and December 2011 were included in this study.

Patient 1

A 25-year-old male presented with a history of profuse sweating of the hands and feet since early childhood, associated with swelling of the fingers. As conventional medical

therapy was not satisfactory in controlling his hyperhidrosis, we performed SILS sympathectomy.

Patient 2

A 30-year-old female presented with long-standing palmar hyperhidrosis. The patient also suffered Raynaud's phenomenon. Conservative measures were tried before progressing to surgical treatments. Finally, we decided to make a sympathectomy.

Patient 3

A 28-year-old female presented with palmar hyperhidrosis. The patient took some medication during 5 year period

Figure 1 Port placement.

Table 1 The demographic data of our patients

	Patient 1	Patient 2	Patient 3
Age (years)	25	30	28
Gender	M	F	F
Operation time (min)	30	60	120
Incision length (cm)	3	3	3
Hospital stay (day)	1	1	1

but the medication was not satisfactory in controlling her hyperhidrosis. Surgery was planned and the three patients were observed in our hospital.

SURGICAL METHOD

During surgery, one-lung ventilation in the lateral position under general anesthesia was provided. The operating surgeon (O U) and assistant (O K) were on the left-hand side of the patient, with the laparoscopic monitor on the right-hand side of the patient. A pneumothorax was produced by introducing 1.5 litres of carbon dioxide via a small incision in the anterior axillary line. A SILS port (Covidien, Mansfield, Massachusetts, USA) was inserted into the 4 mid-axillary intercostal region. This is a flexible multichannel access port that can accommodate upto three instruments, with gas being introduced through a separate channel (figure 1). Three 5-mm SILS trocars (Covidien) were introduced through the SILS port, and a 5-mm 30° laparoscope was introduced into the thorax. With the help of endoscopic dissector and scissors, preserving the second thoracic ganglion, the integrity of the thoracic sympathetic chain is broken at the T2-T3 ganglion level with electrocautery.

The mean hospital stay was 1 day. There were no complications postoperatively. The average incision size was 3 cm. Mean operative time was 70 min (30–120). Postoperative analgesia was provided by regular intravenous paracetamol. This was replaced by standard oral analgesia in the form of paracetamol and tramadol hydrochloride on postoperative day 1 until discharge. All patients were discharged from the hospital on the first day after the operation. Patients characteristics and demographic data are presented in table 1.

OUTCOME AND FOLLOW-UP

- Mean length of hospital stay was 1 day.
- No postoperative complications were noted.

DISCUSSION

Hyperhidrosis, directly or indirectly, by affecting a person's life, causes psychological and social problems. Despite a variety of tried and tested methods of treatment, the most commonly used surgical technique for treatment of upper extremity hyperhidrosis involves the interruption of the upper thoracic sympathetic chain (usually from the second to fourth thoracic ganglia). Numerous studies have shown endoscopic transthoracic sympathectomies (ETS) to be effective, but the potential for adverse effects, particularly the development of compensatory hyperhidrosis, precludes the use of ETS as first-line therapy.² A series of 850 patients with upper extremity hyperhidrosis was treated with bilateral ETS. After a median follow-up of 31 months, 98 per cent of patients reported satisfactory

results, with only 2 per cent developing recurrent symptoms. There were no life-threatening complications. In the current guideline, patients with palmar hyperhidrosis who fail topical therapies and iontophoresis, and who do not tolerate or get relief from botulinum toxin, can be treated effectively with ETS. Side effects, especially compensatory hyperhidrosis in other parts of the body may reduce long-term patient's satisfaction with this procedure. Patients should be informed of the potential for this adverse effect. ETS can also be used for axillary hyperhidrosis, but the relapse rate is high.

The first surgical procedure for hyperhidrosis was performed in 1920. Removal of the thoracic sympathetic chain (T2-3-4 level) was first performed by Leriche. Studies conducted by Hyndman in 1942 and Love and Jurgin in 1964 have revealed that for palmar hyperhidrosis, removal of thoracic sympathetic chain at only the T2 ganglion level is adequate, rather than removing the T2 level and above.^{1 2} Throacoscopic surgery was performed by Kux in 1951 for the first time.³ However, it was not used much until 1980s.⁴

Nowadays, video assisted thoracoscopic surgery (VATS) sympathectomy for palmar hyperhidrosis and VVD has been definitely found superior to conventional thoracotomy, because of the speed and safety of the procedure, postoperative patient comfort and shortening the hospital stay.⁵ In the study, conducted by Atkinson *et al*,⁶ postoperative pulmonary disfunction has been found to be very low in patients who underwent VATS, compared with those who underwent conventional thoracotomy.

SILS has been a quite popular method in recent years. Despite the limited field of thoracoscopy, in our study, single-incision sympathectomy was successfully performed in the first three cases. Implementation of the SILS port is the most challenging part of this method. Port implementation in our first case was quite time-consuming. In the next attempts, the period was shortened. Manipulation of SILS instruments has been performed without difficulty, with co-operation with the experienced anaesthesia team. The other important point to note is the location of the application of the SILS.

As a result, SILS thoracoscopy of hyperhidrosis has become increasingly popular, although there were no randomised clinical trials comparing laparoscopic with SILS surgical treatment of palmar hyperhidrosis. The SILS method can be applied safely as an alternative to classical VATS method.

Learning points

- Hyperhidrosis is a disease, characterised with excessive sweating on the dermatome innervated by overactive sympathetic ganglion.
- The most effective method of treatment is minimally invasive thoracoscopic sympathectomy today.
- Single port laparoscopic surgery method can be applied safely as an alternative to classical VATS method.

Competing interests None.

Patient consent Obtained.

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