

## Endoscopic Thoracic Sympathectomy for Palmar Hyperhidrosis

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Primary palmar hyperhidrosis is a disorder of excessive perspiration. In severe cases it can be socially and professionally debilitating and conservative therapy is usually unsatisfactory. Endoscopic thoracic sympathectomy (ETS) is considered an effective treatment for palmar hyperhidrosis. However, many different procedures have been used: simple resection of the sympathetic ganglion, transection or ablation with cautery, or simple clipping of the sympathetic chain with titanium clips. Furthermore, the extent of sympathectomy has also varied from single (T2 or T3) to extensive (T2-T5). We have performed ETS procedures since 1995. One hundred eighty four patients have undergone ETS for treatment of palmar hyperhidrosis. All patients felt extremely conscious of their severe palmar hyperhidrosis. There were 101 females and 83 males aged from 12 to 60 years old (mean age: 27 years, median age 22). Ninety five percent of patients presented with plantar hyperhidrosis. The following distribution of hidrosis was noted: axillae (63%), face (15%), and body trunk (10%). In the earlier period, from 1995 to 2000, the second and third thoracic ganglions (T2 and T3) were resected. Subsequently, from 2000 to 2003, only T2 was resected. Since then we have reverted back to T2 and T3 resection. It is difficult to identify the thoracic ganglions precisely and determine what to resect exactly during operation. In the present paper we used the terms 'T2 resection' as the resection of the sympathetic trunk and thoracic ganglions which are located in the second intercostal space (the space from the lower edge of the second rib to the upper edge of the third rib) and 'T2 and T3 resection' as the resection of the sympathetic trunk and thoracic ganglions which are located in the space from the lower edge of the second rib to the upper edge of the fourth rib. We usually inject lidocaine hydrochloride us-

ing a 21-gauge 20 cm-long needle underneath the visceral pleura. This procedure makes it easier to open the pleura and dissect the sympathetic trunk. However, surgeons should be careful not to injure the underlying intercostal vein under the sympathetic trunk. We believe that the local anesthesia blocks stimulation of sympathetic ganglions during resection, which may decrease the temporary postoperative palmar sweating. Complications during the operation were rare (2/184, 1%). Only 2 cases showed active bleeding over 200 ml due to injury of the intercostal vein or artery. In 2 cases, a unilateral small thoracotomy was necessary because of pleural adhesions. Early postoperative complications occurred in 4 cases (4/184, 2%); one acute pulmonary edema, 2 postoperative pneumothorax, and one postoperative bleeding. No patients had Horner's syndrome. The effect of ETS on the palmar hyperhidrosis was apparent immediately. Short term efficacy of sympathectomy was recognized in all cases. A detailed questionnaire was administered 3 months, 6 months, 1 year, 2 years and over 3 years after operation.<sup>1)</sup> All of the patients experienced obvious improvement. Most of patients experienced cessation or mild sweating only for a long time after the operation. Recurrence of palmar hyperhidrosis was defined as when the patient recognizes moderate sweating even if it was much less than the preoperative condition. In T2 and T3 resection, the recurrence rate was 0% and 3% at 1 and 2 years after ETS, respectively. In T2 resection, recurrence rates were 15% and 19% at 1 and 2 years after surgery, respectively. It was not rare for a patient to experience recurrence more than 3 years after surgery. This high recurrence rate after single T2 resection was unexpected. We have since changed the operation procedure back to the extended resection (T2 and T3). The recurrence rate reported elsewhere is any between 0 to 16% after various ETS procedures.<sup>2-7)</sup> We also noticed that recurrence began 6 months after the operation and gradually increased. We speculate the possible reasons of the high recurrence rate in T2 resection are possible effects of the T3 ganglion, Kuntz fibers, nerve regeneration, and incomplete resection of the T2 ganglion. It is also possible to resect

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the sympathetic trunk only without exact T2 ganglion resection in patients who experience recurrence. To reduce the possibility of recurrence we recommend T2 and T3 resection (to resect the ganglions and all the connecting fibers located in the space from the lower edge of the second rib to the upper edge of the fourth rib). Compensatory sweating (CS)<sup>8)</sup> is a common and troublesome complication following ETS that may persist for a long time. CS was seen predominately on the body trunk (86%). CS was also observed in the thighs (73%), buttocks (60%), back (28%), crura and dorsal feet (5%). In T2 and T3 resection, all patients experienced CS and over 70% of the patients felt it was severe. Even in T2 resection, 90% of patients experienced CS and in 50% of these, it was severe. High rates of CS are reported in Asian countries with hot and humid climates.<sup>5,9)</sup> Most patients noticed worsening of CS in the hot season or in hot conditions. As mentioned by Lai and coworkers, climate plays a major role in the occurrence of CS.<sup>9)</sup> Endoscopic thoracic sympathectomy is an effective and safe method for the treatment of palmar hyperhidrosis. However, there was a high incidence of CS, which was not easily controlled. Limiting the extent of single sympathectomy was reported to reduce CS. However, the efficacy of T2 ganglion resection was not optimal because of its high incidence of recurrence with an unexpected high incidence of CS. We conclude that two-ganglion resection (T2 and T3) should be performed because it can reduce the incidence of recurrence even if it may subsequently cause a slightly higher intensity of CS.

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