

back, abdomen, thighs and buttocks, and most of the patients answered that it occurred more after exercising and in summer. For the question of whether they took some countermeasures against sweat, the answers included changing clothes and underwear often, placing a towel between the skin and underwear, not wearing a T-shirt that is easily seen through, using deodorant spray, wrapping a towel around the lower back, trying not to sweat, wiping off the skin often, cooling the body using a refrigerant, etc.

Current daily life

Most of the patients answered that there were no feelings of inconvenience in their daily lives after the surgery compared with preoperative conditions. Twenty-one patients (60%) answered that they had psychologically become positive, which was considered a high number (Fig. 4). As for the operated areas after surgery, most patients answered that they had no pain and were not overly disturbed or bothered by it.

• Are there any mental changes before and after the surgery?

A	Became negative	3
B	Became slightly negative	2
C	Unchanged	9
D	Became slightly positive	10
E	Became positive	11

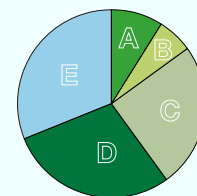


Fig. 4. Daily life.

• Were you anxious about the surgery?

A	Very anxious	2
B	Slightly anxious	13
C	No opinion	1
D	Not very anxious	15
E	Not anxious at all	4

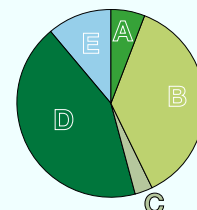


Fig. 5. Anxieties over the surgery for palmar hyperhidrosis.

• Rate your level of satisfaction with the surgery on a scale of 10 to 100.

Average: 79.4 points (scale of 10–100)

• If you were consulted by someone who has a similar degree of palmar sweating, how would you describe this surgery?

A	I would recommend the surgery	13
B	I would discuss the surgery	16
C	No opinion	4
D	I would rather not talk about the surgery	1
E	I would not talk about the surgery	1

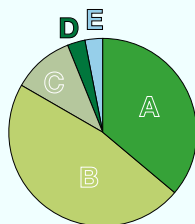


Fig. 6. Overall assessment of the surgery for palmar hyperhidrosis.

Surgery for hyperhidrosis

Nineteen patients (54.3%) answered that they hardly felt anxious about the surgery, which was a rather high rate, but 15 patients (42.9%) reported some degree of anxiety (Fig. 5). Regarding the side effects except for CS, 11 patients (31.4%) answered that they experienced some type of side effects, including dry hands, a cold sense in the hands, hypesthesia, etc., and most of them had indefinite complaints.

Postoperative satisfaction

The assessment of the satisfaction of the surgery on a 100-point scale was 79.4 points (10–100 points) on average. For the question that asked whether they would like to tell other patients with palmar hyperhidrosis about the present surgical method, 13 patients answered that they would like to recommend it, and 16 patients said would like to tell them about it, a total of 29 patients (82.9%) for both. Thus, it was clear that many of the patients wished that some sort of information about treatment with surgery would be provided (Fig. 6).

Discussion

With the widespread use of thoracoscopy, ETS for palmar hyperhidrosis has developed quite dramatically (Kux, 1978; Chen et al., 1994; Okabayashi et al., 1999). However, the largest problem continues to be CS which occurs as an adverse effect and many patients gradually experience this problem after they return to their daily lives. Therefore, in order to find out the true satisfaction level of patients who had ETS, it is important to study the degree of sweating after at least one month after hospital discharge (Andrews and Rennie, 1997). In this study, the efficacy of ETS and the degree of CS were studied by surveying the long-term patient satisfaction using a questionnaire after surgery.

The average postoperative observation period was 33 months, and as for the amount of palmar sweating, it completely stopped in 82.9% of the patients and occurred slightly in 17.1%, thus showing the positive effects of ETS in all of the patients. The average rate for patient satisfaction was 79.4 out of 100 points, and 82.9% of the patients wished to be provided with some sort of information about ETS for people who had the same problems with palmar hyperhidrosis. It is believed that these results show that ETS is sufficiently accepted as a treatment for palmar hyperhidrosis. On the other hand, 7 out of 35 patients (20%) gave a satisfaction level of 50 points or less, and CS which was more than they expected was observed in all 7 of these patients. Among them, 1 patient who reported a satisfaction score of 10 points had severe CS and answered that it was good that palmar sweating stopped but CS became a new problem and this patient thus regretted having undergone the surgery. Hirakawa et al. (2004) reported the frequency of CS to range from 7% to 98.6% according to numerous reports, but it is believed that this disparity results from differences in the definition of CS, and it essentially develops in all patients to a greater or lesser degree and most frequently occurs on the

back, chest, abdomen, and thigh. In this survey, CS also developed in 97.1% of the patients, and 82.9% of the patients answered that they were disturbed because it was more than they had expected before the surgery. According to an analysis of a questionnaire in 40 patients by Libson et al. (2007), 6 patients (15%) answered that they regretted having surgery for CS seriously affecting their quality of life, therefore surgeons should be careful when selecting patients to undergo this treatment. We also came to realize the importance of preoperative explanations in regard to CS, and it will be necessary to improve this point in the future. Regarding methods to minimize CS, Schmidt et al. (2006) and Kwong et al. (2008) reported that blocking at the level of Th2 enhanced CS according to analyses of the blocking sites of thoracic sympathetic nerves, and Jaffer et al. (2007) also described that CS frequently developed by blocking at the level of Th2 for facial hyperhidrosis and erythromania. Moreover, Licht and Pilegaard (2004) reported that CS developed to a large degree in axillary hyperhidrosis with a large blocked area from the levels of Th2 to 4. Therefore, for non-severe palmar hyperhidrosis, blocking only Th3 and avoiding blocking Th2 can be taken into consideration. Moreover, Lin et al. (1998) and Chou et al. (2006) recommend a reversible clipping method as a blocking method. However, Miller and Force (2008) considered the effect of the clipping method to be uncertain, as there is also a possibility of recurrence, while CS is irreversible even with clipping, and he goes on to describe that it is safer to carefully perform a sympathectomy after determining whether CS is significant by temporarily performing a sympathetic nerve block before surgery. Regarding the above problems, the findings and recommendations remain controversial. There is also a report that CS is an allowable adverse effect and it is desirable to have surgery at an early stage by adulthood (Steiner et al., 2007). Thus, the relationship between ETS and CS has not yet been elucidated. Under these circumstances, a report by Fujita et al. (2002) that perioperative temperature or blood

flow differences in finger tips correlates with CS and a report by Bonde et al. (2008) on the objective assessment of the amounts of sweating while applying sweat stimulation with a method called ventilated capsule technique are very interesting findings. It is believed that assessing the degree of CS as well as accurately estimating it preoperatively and then utilize that data for selecting optimal treatment protocol remains an important study for the future.

In general, it has been reported that a patient who demonstrates more sweating from heat than from mental strain tends to demonstrate more CS regardless of the operative method (Hirakawa et al., 2004). Meticulous attention is therefore needed for a patient who tends to “naturally sweat a lot over the entire body.” Okabayashi et al. (2004) cited a guideline with 10 items as key points for the preoperative explanation and described that it was particularly important to thoroughly explain the occurrence of CS and the irreversibility of the present surgery. We are now planning to make use of the knowledge we obtained according to the results [especially the patient satisfaction score of 79.4 points, CS development of 97.1% and that 29 patients (82.9%) answered they were disturbed because it was more than they expected] of this questionnaire about appropriate countermeasures that patients can take against CS in the future, as well as providing a sufficient explanation about CS for patients with palmar hyperhidrosis and also obtaining informed consent before performing any surgical procedures.

Palmar hyperhidrosis appears to be increasing in modern society due to the recent upsurge in stress. It is a disorder strongly affected by familial factors, but there is still no definitive treatment for it, and treatment should therefore be selected according to the patients wishes and desires as a rule. It is believed that there are many potential patients with palmar hyperhidrosis, and the problem is serious, particularly for junior high school, high school and university students, but the analytical results of the this questionnaire showed that the problem of postoperative CS was

more serious than has been previously thought. Therefore, many believe that treatment needs to be carefully selected after achieving a better understanding of the effectiveness and problems associated with ETS for palmar hyperhidrosis.

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