

Evaluation of quality of life over time among 453 patients with hyperhidrosis submitted to endoscopic thoracic sympathectomy

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Objectives: Current data do not provide enough information on how quality of life (QoL) evolves over time in cases of endoscopic thoracic sympathectomy (ETS). The purpose of this study was to ascertain whether the immediate improvement in QoL after the surgery was sustained until the fifth postoperative year.

Methods: This was a prospective, nonrandomized and uncontrolled study. From March 2001 to December 2003, 475 consecutive patients with hyperhidrosis submitted to ETS were included. A QoL questionnaire was applied at the preoperative day, around the 30th postoperative day, and after the fifth year.

Results: After excluding 22 patients who did not answer all the questions, we analyzed 453 patients. Their ages ranged from 11 to 57 years old, with a mean of 25.3 + 7.9 years, including 297 female patients (65.6%). All patients were assessed on three occasions: before surgery, around the 30th postoperative day, and after the fifth postoperative year. The QoL before surgery was considered to be poor or very poor for all patients. The QoL around 30 days after surgery was better in 412 patients (90.9%), the same in 27 patients (6.0%), and worse in 14 patients (3.1%). After 5 years, 409 patients (90.3%) were better, 27 (6.0%) were the same, and 14 (3.1%) were worse. There were no differences between these postoperative times according to the McNemar statistical test.

Conclusion: The patients had an immediate improvement in QoL after ETS, and this improvement was sustained until the fifth postoperative year. (J Vasc Surg 2012;55:154-6.)

In primary hyperhidrosis, sweating occurs in excess of what is required for normal thermoregulation. It is a chronic disorder that can be associated with subjective suffering, thereby causing impairment to the patient's quality of life (QoL).¹ Endoscopic thoracic sympathectomy (ETS) provides excellent resolution of palmar, axillary, and facial hyperhidrosis,^{2,3} as observed in previous studies with short or medium-term postoperative follow-up.

Patients are usually well adapted to the changes in body temperature control after some years. However, current available data do not provide enough information on how QoL evolves over time after surgical treatment. Moreover, there are no studies yet to compare the immediate results with long-term results, such as 5 years after surgery.

The purpose of this study was to assess the evolution of QoL in a large series of 453 consecutive patients with primary hyperhidrosis who underwent ETS in order to

detect any changes in the patient's QoL after 5 years when compared to 1 month after surgery.

METHODS

A prospective, nonrandomized, and uncontrolled study was conducted in accordance with ethical regulations specified by the University's Ethics Committee for the Analysis of Research Projects on Human Experimentation. The patients were recruited from a database of patients who had undergone ETS to treat primary hyperhidrosis in our institution between March 2001 and December 2003.

Twenty-two patients were excluded from the study because of incomplete answers on their QoL questionnaires. Consequently, the final sample consisted of 453 consecutive patients: 303 (67.8%) with palmar hyperhidrosis, 137 (30.2%) with axillary hyperhidrosis, and 9 (2%) with facial hyperhidrosis.

Patients were aged 11 to 57 years old, with a mean of 25.3 ± 7.9 years and median of 24 years. There were 297 women included in this group (65.6%). All patients had poor or very poor QoL before surgery. They all had undergone bilateral ETS, following exactly the same protocol of treatment,⁴ except for the level of ganglion resection, which varied according to the location of the diaphoresis (Table I). All procedures followed the principles of the fast track rehabilitation program of our department.⁵

All patients were evaluated twice after surgery for the purpose of this study. The first evaluation was performed 30 days after the procedure in order to measure its impact

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Table I. Resection levels among the patients

| <i>Sympathectomy level</i> | <i>Number</i> | <i>Percentage</i> |
|------------------------------|---------------|-------------------|
| Palmar (R2) | 29 | 6.4 |
| Facial or palmar (R2+R3) | 209 | 46.1 |
| Palmar (R3) | 27 | 6.0 |
| Axillar or palmar (R3+R4+R5) | 132 | 29.1 |
| Axillar (R4+R5) | 56 | 12.4 |
| Total | 453 | 100.0 |

R, Ribs.

on the patient's QoL; the second evaluation occurred 5 years after ETS.

On each of these two postoperative evaluations, a clinical protocol for QoL⁶ assessment adapted to the English language⁷ was applied. This questionnaire was posted by Amir et al⁶ in 2000 and is specific for patients with hyperhidrosis. The questionnaire's total score may range from 20 to 100, and the patient's result may then be classified into three different categories of satisfaction and impact of the treatment on his QoL. When the total score is greater than 68, the QoL is considered to be worse than before surgery; from 67 to 52, without any change; and from 51 to 20, better than before surgery.

The QoL questionnaire was applied by a single independent trained nurse who had no previous knowledge of the surgical technique used or the occurrence of intra- or postoperative complications.

The differences between the preoperative evaluation and the two other evaluations made after the operation were named immediate and late effects of surgical treatment on the patients' QoL.

Statistical analysis. Means and SDs were used in the descriptive analysis of parametrically distributed continuous variables, whereas frequencies were used for categorical variables. The *t* test was used to compare means and the McNemar test was used to compare QoL over time, on the three consecutive analysis time points, and the kappa coefficient was used for analysis. The threshold used for *P* values was 5%.

RESULTS

There were no death occurrences and no need to convert the ETS procedure into open surgery. There were 2 cases of right-sided residual pneumothorax (0.4%) during the immediate postoperative period, which did not require pleural drainage. Eleven patients (2.4%) presented slight/weak pleural adhesions that were detached using an endoscopic scalpel. Sinus bradycardia occurred in 1 patient (0.2%), right transient Horner's syndrome in 1 patient (0.2%), venous bleeding >300 mL in the right hemithorax in 1 patient (0.2%), and postoperative paresthesia on the right upper limb in 1 patient (0.2%).

Complete bilateral remission of the palmar, axillary, or facial sweating was achieved in 441 patients (97.3%) after 5 years of follow-up. In this sample, only 37 patients (8.2%) did not present compensatory hyperhidrosis (CH), which

was mild in 92 patients (20.3%), moderate in 174 patients (38.4%), and severe in 150 patients (33.1%). Nevertheless, only 7 patients (1.5%) were dissatisfied with the results. These individuals presented severe CH and said that they regretted having undergone the surgical procedure.

The patients' QoL at 30 days and 5 years after the surgery are shown in Table II.

There was no significant change in the patients' QoL from 30 days to 5 years after the surgery, according to the statistical analysis (McNemar test). The responses were the same at both time points for 410 patients (90.5%), whereas the situation had worsened for 23 patients (5.1%) and improved for 20 patients (4.4%). The calculated kappa coefficient that was calculated can be interpreted as representing moderate concordance (Landis and Koch).

DISCUSSION

At present, QoL questionnaires have become an important tool for quantifying results in medicine, and this psychosocial factor has important implications for better management of these patients.^{4,6,8-10} Hyperhidrosis is always accompanied by subjective reduction of QoL for the patient, who feels uncomfortable in a world where sweating is considered antiesthetic and may hinder socialization. We have observed that although these patients do not present any risk of death or any organ failure, their QoL is severely diminished. Furthermore, in some cases, it may not only cause anxiety, distress, and desolation, but it can also be incapacitating and even pose high risks for some professionals, such as police officers, who manipulate weapons, and electricians who handle electric or electronic material.

At our service, ever since 2001, all patients with hyperhidrosis have been asked to fill out a QoL questionnaire at their first consultation. Not only has this practice allowed us to make several analyses, but it has also enabled us to observe the degree of distress and complaint that these patients present, thus contributing to improved understanding and assistance. In the present sample, we have noticed that all our patients had poor or very poor QoL before the operation. ETS had good outcomes for most of the patients and a low rate of complications, regardless of the different level of resection used, as also seen in other studies over recent years.^{11,12}

CH is frequently observed after ETS and has been described in nearly all previous studies. In some patients, the abundant compensatory sweating may be difficult to control and therefore may worsen their QoL and be a reason for them to regret the surgery. The high incidence in our service is consistent with the experience of several centers in other countries.^{13,14} At present, there is no available clinical or laboratory data that can predict the intensity of postoperative CH. However, we know that higher resection levels (T2),^{15,16} multiple ganglion resection¹⁷ and patients with body mass index over 25¹⁸ increases the risk of severe CH after surgery.

In our opinion, QoL improvement is the best outcome of the primary hyperhidrosis surgical treatment and questionnaires are the most efficient tool to objectively assess

Table II. Comparison between 30 days after surgery and 5 years after surgery regarding responses to the QoL questionnaire

| Thirty days after surgery | Five years after surgery | | | Total |
|---------------------------|--------------------------|-----------|-----------|--------------|
| | Better | Same | Worse | |
| Better | 391 | 16 | 5 | 412 (90.9%) |
| Same | 12 | 13 | 2 | 27 (6.0%) |
| Worse | 6 | 2 | 6 | 14 (3.1%) |
| Total | 409 (90.3%) | 31 (6.8%) | 13 (2.9%) | 453 (100.0%) |

QoL, Quality of life.
McNemar test: $P = .882$. Kappa: 0.454. Confidence interval: 0.323-0.585. Consistency: 90.5%; Worse: 5.1%; Better: 4.4%.

QoL, in addition to being easily applicable. Most studies in the literature analyze the effect of ETS at two different time points (the first and last evaluations), and their conclusions regarding the long-lasting effects of the treatment are their main drawback.

Patients submitted to ETS are frequently anxious about their prognosis and how their clinical situation will evolve over time.¹⁸ Physicians were not able to anticipate whether a patient would not need a secondary treatment based on the good results seen 1 month after surgery. This study has addressed such issues and its 5-year follow-up has shown that the good short-term results have remained the same in the long run. All but a few patients had improvement in their QoL. The rate of complications was so low that it did not interfere with the results. The most important information was undoubtedly the occurrence of compensatory hyperhidrosis, which is the single most contributing factor to the evolution of the patients' QoL status.

In conclusion, patients with primary hyperhidrosis who have an improvement in QoL soon after ETS can rest assured that this improvement will be sustained until the fifth postoperative year.

AUTHOR CONTRIBUTIONS

Conception and design: NW, JC, PK, LO, MM, FJ
Analysis and interpretation: NW, JC, MM
Data collection: NW, JC, PK, MM
Writing the article: NW, JC, PK, LO, MM, FJ
Critical revision of the article: NW, JC, PK, LO, MM, FJ
Final approval of the article: NW, JC, PK, LO, MM, FJ
Statistical analysis: NW, JC, LO, MM
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Overall responsibility: NW

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