

The Borås Experience of Endoscopic Thoracic Sympathicotomy for Palmar, Axillary, Facial Hyperhidrosis and Facial Blushing

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ABSTRACT

Objective: To study the outcome of endoscopic thoracic sympaticotomy (ETS) for palmar, axillary, facial hyperhidrosis and facial blushing.

Subjects: 1152 patients, 59% women and 41% men.

Intervention: ETS was performed by transection of the sympathetic chain where it overlies the second and third rib. The nerve was divided also over the fourth rib in patients with axillary hyperhidrosis. Questionnaires were sent to all patients.

Main outcome measures: The effect of surgery was assessed by a 10 grad visual analogue scale (VAS) by the patients. The results were divided into effect rate (the effect on the symptom) and overall satisfaction rate, taking into account any side effects and complications apart from the effect.

Results: The response rate was 90%. The mean follow up time, effect rate and overall satisfaction rate were: 38 months for palmar hyperhidrosis, 99.4% and 87%; 26 months for axillary hyperhidrosis, 94.5% and 68%; 31 months for facial hyperhidrosis, 97% and 76%; 8 months for facial blushing, 96% and 85%.

Conclusion: ETS is a very effective procedure in palmar, axillary and facial hyperhidrosis and facial blushing. The overall satisfaction rate is very good for palmar hyperhidrosis and facial blushing, not equally good but acceptable for facial hyperhidrosis. The lower satisfaction rate in patients with axillary hyperhidrosis makes this a questionable indication for ETS.

Key words: thoracoscopy, sympathectomy, hyperhidrosis, facial blushing.

INTRODUCTION

Since the first report on sympathectomy for hyperhidrosis (10), the open surgical route to gain access to the upper thoracic sympathetic chain has varied (1, 15, 16). During the last decades, thoroscopic surgery has to a great extent replaced the open operations (8, 11-13). Since 1987 we have used a one port system for thoracoscopy and instead of removing, just dividing the sympathetic chain (sympathicotomy) (3).

We have previously reported the results of endoscopic thoracic sympaticotomy (ETS) on hyperhidrosis, angina pectoris, vasospastic disease and sympathetically maintained pain (2-4, 6, 7, 9, 14, 17). The short term results on hyperhidrosis have been excellent. In our earlier questionnaires several patients with hyperhidrosis spontaneously reported great satisfaction having been relieved also from attacks of facial blushing. For this reason, we began to accept a few patients with severe sympathetically mediated facial blushing for surgery. Due to publicity in the popular press many patients became aware of the possibility of surgical treatment, which is why we achieved a large number of

patients with facial blushing during a short period of time.

This short overview reports the long/medium term effects on hyperhidrosis and the short term effects on facial blushing of ETS.

PATIENTS AND METHODS

General anaesthesia with a single lumen endotracheal tube was used. The thoracic cavity was entered with a modified urologic electroresectoscope (7 mm in diameter) in the anterior axillary line under the pectoral fold. The sympathetic chain was transected with a diathermia sling over the second and third rib and in patients with axillary sweating also over the fourth rib (3).

Questionnaires were sent to all 1152 patients operated on between April 1989 and April 1996. The different groups were a) *palmar hyperhidrosis* 785 patients; b) *axillary hyperhidrosis* 93 patients; c) *facial hyperhidrosis* 30 patients; d) *facial blushing* 244 patients.

The mean age was 31 years (range 9-75) in patients

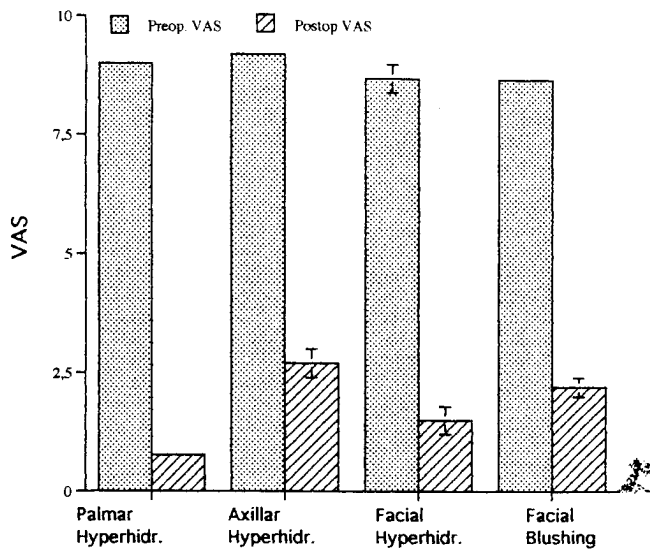


Fig. 1. Pre- and post-operative ratings of the symptoms assessed by the patients on a 10 grade Visual Analogue Scale (VAS). Mean ± SE. $p < 0.0001$ for all pre- and post-operative comparisons.

with hyperhidrosis and 35 years (range 15–67) in patients with facial blushing.

Sweating and blushing were rated on a visual analogue scale (VAS) (0 = no sweating or blushing, 10 = most exaggerated sweating or blushing) by the patients. The effect rate was defined as the percentage of patients who had a reduced VAS rating of their symptom after surgery. Questions were asked on overall satisfaction of the operation (taking any complications and side effects into account apart from the effect). Mean ± SE and paired *t*-test with two tails were used for statistical computation.

RESULTS

There was no mortality nor conversion to open surgery. Intercostal drainage was used to treat pneumothorax in

Table I. The number of patients, follow-up time and reoperation rates during follow-up, and effect rate at the end of the follow up period (effect obtained on the condition)

	No of patients	Follow-up time (range)	Reoperated on	Effect rate
Palmar hyperhidrosis	785	38 months (4–88 months)	4,3%	99,4%
Axillary hyperhidrosis	93	26 months (4–55 months)	2,2%	94,5%
Facial hyperhidrosis	30	31 months (4–67 months)	4%	97%
Facial blushing	244	8 months (2–29 months)	0	96%

12 patients (1.0%), and hemothorax in 4 patients (0.3%).

Horner’s eye syndrome occurred in 5 patients (0.4%). One patient had a contusion of the long thoracic nerve. One patient had a small pulmonary embolus, detected three weeks after surgery. Her recovery was uneventful. One patient with a history of myocardial infarction developed chronotropic insufficiency necessitating pacemaker treatment.

The response rate to the questionnaire was 90%. The follow up time and reoperation rates during the follow-up time are given in Table I. The patients’ assessments of symptoms preoperatively and at the end of the follow up time are shown in Fig. 1. The effect rate, meaning that effect was obtained on the target condition at the end of the follow-up time, is given in Table I.

Compensatory sweating, meaning exaggerated sweating in other parts of the body than those denervated, was found in 59.8% of the patients. Gustatory sweating, which means exaggerated sweating predominantly in the head and neck area during exposure to certain smells and tastes, were reported by 28% of the patients.

Table II shows the overall satisfaction rate (taking into account both effects, side effects, and complications) at the end of the follow up time.

DISCUSSION

The endoscopic technique has made upper thoracic sympathetic ablation a popular operation as the surgical trauma is minimal compared with that of traditional open surgical procedures. However, ETS leads to irreversible denervation and the enthusiastic reception of the procedure should not lead to widening of the indications without careful assessment of the outcome in various conditions. We and other surgical groups have reported very good short term effects on palmar hyperhidrosis (3, 6, 7, 12). This report shows

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Table II. The overall satisfaction rate (effect, side effects and complications taken into account) at the end of the follow up time

	No of patients	Totally satisfied	Dissatisfied to some extent	Regretted operation
Palmar hyperhidrosis	785	87,3%	10,2%	2,5%
Axillary hyperhidrosis	93	68,1%	20,8%	11,1%
Facial hyperhidrosis	30	76%	7%	17%
Facial blushing	244	85%	13%	2%

that the medium to long term results on palmar hyperhidrosis are very good. The fact that the overall satisfaction rate was lower than the effect rate was in most cases explained by side effects or insufficient effect. The memory of the troublesome local hyperhidrosis will probably decrease over time after its cure by ETS whereas the compensatory sweating to some degree remains. Very few, however, regret the operation. The subsequent reoperations were more frequent in the early part of the series than during the later part. In most of the cases they could be explained by a primary failure to transect the nerve over the second rib.

The effect- and satisfaction rates in isolated axillary hyperhidrosis are not as good as for handsweat. For this indication there are also other options, e.g. local application of aluminiumchloride solution and local excision of the sweat glands. We have therefore become more reluctant to accept patients with isolated axillary hyperhidrosis for ETS.

The patients operated on for facial hyperhidrosis are rather few, why the results have to be interpreted with caution. The effect rate was very good but the overall satisfaction rate was somewhat disappointing. However, the 17% who regretted the procedure represent only five patients.

A blush is the reflection of the vasodilatation of cutaneous blood vessels elicited by emotional stimuli, and is regarded as the hallmark of embarrassment. Facial blushing has been described as a specific symptom of social phobia not associated with other forms of anxiety disorders (5). The type of blushing which is likely to be mediated by the sympathetic nerves is the uncontrollable, rapidly developing blush which is typically elicited by receiving attention from other people.

The effect rate of ETS on facial blushing is excellent and the overall satisfaction rate of 85% is very good. Since this is a new indication more detailed information should be obtained about the effect on the quality of life and comparison with other existing options, such as drug- and psychological therapy. Long term results are also required before facial blushing can be regarded as an established indication for ETS.

In summary, palmar hyperhidrosis is an established indication for ETS where good long term results can be expected. We regard isolated axillary hyperhidrosis a questionable indication for surgery because of the known results and the fact that there are other treatments available. Larger series of patients with facial hyperhidrosis are required before ETS can be recommended.

The short term results on facial blushing are very promising, but information on the long term results and comparisons with alternative treatment are lacking.

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