Treatment of Social Phobia by Endoscopic Thoracic Sympathicotomy

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ABSTRACT

Objective: To analyse the severity of various symptoms and the developmental life history in social phobia. To estimate the value of ETS in the treatment of chronic social phobia.

Design: Prospective study.

Setting: Clinic for Psychoneurology and Surgery in Tampere, Finland.

Subjects: Consecutive series of patients ($n = 51$).

Interventions: Endoscopic thoracic sympathicotomy.

Main outcome measures: Qualitative ideographic inquiry. Questionnaire of the symptom severity using visual analogue scale.

Results: The life history included mental and physical abuse in 61%, paternal alcoholism in 26%. Four family subtypes were named: quarrelsome, cruel, alcoholic, and perfectionist. The pathognomonic symptoms of social phobia: hyperhidrosis, palpitation, blushing, tremor, and anxiety, were all highly significantly ($p < 0.001$) alleviated by ETS. 88% of the patients were satisfied with the result. There were no complications.

Conclusion: ETS seems a promising alternative to conservative therapy for social phobia.

Key words: social phobia, endoscopic thoracic sympathicotomy, hyperhidrosis, blushing, palpitation, tremor, anxiety.

INTRODUCTION

Social phobia is a recent disease entity, which the diagnostic psychiatric criteria in DSM-III-R, DSM-IV and ICD-10 recognise. It is quite common, its lifetime prevalence is around 10% to 15% (12, 22). The essential features of social phobia include fear of scrutiny by other people, fear of performing in public (stage fright), fear of eating with others because of trembling of the hands, (commonly called "coffee cup neurosis" in Finland), fear of using public bathrooms (2), blushing and fear of blushing (19), sweating, stuttering, and trembling (23, 32). Social phobia can be seen as a continuum of symptoms from the mildest form of mere overt shyness and fear of embarrassment to the extreme of avoidant personality disorder (9), a distinct disease entity, which the DSM-IV specifies separately.

Although there is some controversy (5, 11, 21, 26), it is evident that the sympathetic nervous system plays a major role in the bodily symptoms of social phobia, and somewhat less in panic disorder. In panic disorder there is an increase in heart rate without a parallel increase of plasma nor-epinephrine level. This has been attributed to a decrease in parasympathetic tone, thereby altering the balance of sympathetic/parasympathetic activity without a change in sympathetic outflow (38). On the other hand, the finding of Stein et al (27) of increased plasma levels of norepinephrine in social phobic patients suggests raised sympathetic tone in these patients, β-blocking agents such as propranolol and atenolol are successful in the treatment of social phobia (16).

Endoscopic transthoracic sympathectomy has widely been regarded as the treatment of choice for palmar hyperhidrosis (8), craniofacial sweating (14), and blushing (37, 39), i.e. many of the bodily symptoms of social phobia. Phobic patients have a decreased heart rate variability suggesting altered cardiac autonomic control and hence increased risk of sudden cardiac death (15). It is known that sympathectomy prevents sudden cardiac death caused by overt sympathetic arousal and cathecholamine dependent* or other malignant, *e.g.* long QT -dependent, arrhythmia (24).

Thus, it was decided that it was ethically sound to use ETS for carefully selected patients with chronic social phobia resistant to psychotherapy and drug therapy. In many cases addictive behaviour added to the indications.

* Telaranta T. Left cervical sympathectomy in the prevention of sudden cardiac death. XIth Brachial Plexus Symposium, Lausanne 1994.

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PATIENTS AND METHODS

Patients' description

From the autumn of 1995 to the beginning of 1997 in 51 patients suffering from social phobia a total of 94 thoracoscopic sympathectomies were performed. 33 of the patients were female, mean age 39 years, and 18 were male, mean age 42 years. 37 patients had a lower academic or skilled education, 7 had higher academic degrees and 7 were unskilled workers. 6 of the patients held an executive position.

Eight patients were operated on on the left side only, first purposely in the pilot series of 6 patients and in 2 because a bilateral operation could not be performed because of adhesions. Thus only 43 patients were included in the final prospective bilateral series. One of the patients was unavailable for the follow-up and no response to the inquiry letter has been received. Thus the final analysis and the statistical calculations were made using the results of 42 patients.

Diagnostic criteria and indications

The symptoms were mostly long-standing. The diagnoses were made according to the criteria of DSM-IV (3) by psychiatrists for the most part, or by psychologists or by the author in some of the cases, when the patients refused a psychiatric consultation. A modified brief social phobia scale was used to confirm the diagnosis (7). The indications for the operation were failure of psychotherapy or long-standing pharmacotherapy.

A thorough ECG analysis with QT-interval calculations, exclusion of thyroid or adrenal hormonal disorders and a prognostic/diagnostic stellate ganglion block followed by a challenge test in anxiety triggering situation, were performed before the final decision to operate.

Qualitative inquiry

The patients filled in a questionnaire concerning their main symptoms and estimated the severity of the symptoms on a visual analogue scale from 0 to 5, both pre- and postoperatively as well as their overall satisfaction with the operative result. When filling in the postoperative questionnaire, they had no access to their previous responses.

A careful family history was also recorded according to ideographic qualitative analysis (1). Individual phenomena and causes were explained according to the life historical continuum contrary to the conventional nomothetical inquiry, where the events are explained as fitting into known conformities. A certain preunderstanding in the sense of hermeneutic phenomenology is crucial to the success of especially this kind of ideographic inquiry (20). The vastness of the world of experience will directly influence the certainty of the final goal. The preunderstanding for this type of inquiry was formed, firstly through the anthropological conception based on the author's 30 years of medical experience (30) and, secondly on his experience with various findings while working in the field of surgery of the sympathetic nervous system (31). This kind of combination of hard and soft data together in one single investigation is emphasised by Strauss and Corbin (29).

This preunderstanding led to the pilot study with only left-sided operation, which soon had to be widened to the bilateral approach.

An independent doctor, without a similar preunderstanding, helped the patients and evaluated the results from the questionnaires. The protocol included follow-up inquiries at 2 weeks, 2 months, and one year postoperatively.

Operative method

The operations were performed under general anaesthesia employing a single lumen endotracheal tube.

Two liters of CO_2 and then a urethral resectoscope were introduced through an incision of about 1 cm in the anterior axillary line in the third or fourth intercostal space. The 2nd to 4th or 5th ganglia were ablated by electrocautery, firstly by coagulating with a low monopolar current to avoid painful neuroma formation (4) and then sharply cut by electrocautery against the underlying rib. The 2nd thoracal ganglion is easily found because the superior intercostal artery overrides the second rib (6). Except in the 6 pilot cases, a bilateral approach was used in a single setting whenever possible. At the end of the procedure the lung was reexpanded manually under visual control on the videoscope.

A Heimlich suction tube was left overnight occasionally. A postoperative chest x-ray was routinely taken and the patients stayed overnight in the hospital.

Statistical analysis of the data

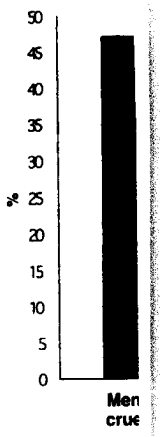
Statistical analyses was performed using the Wilcoxon matched-pairs signed-ranks test.

RESULTS

Qualitative inquiry

The qualitative inquiry of the life histories led to the recognition of five subtypes thought to be relevant for the evolution of phobic behaviour.

Type 1. Family quarreling of various degrees from everyday parental nagging and fighting to separation threats: "If you won't behave better, I will abandon all of you, leave you to your fate and leave you for good".



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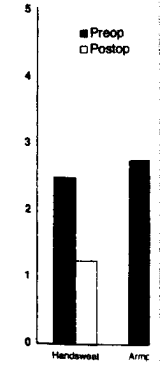

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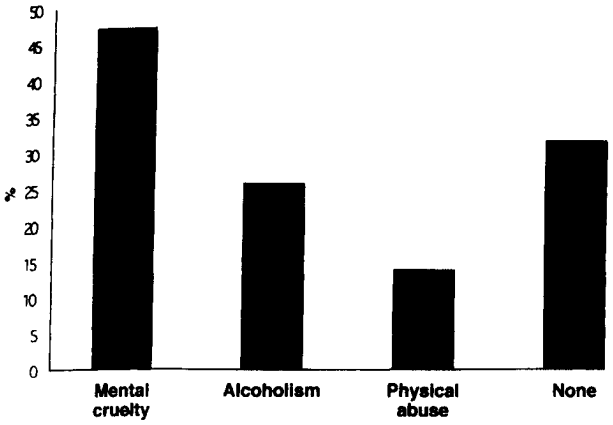

Fig. 1. Occurrence of violence in childhood as reported by the patients.

Type 2. Physical abuse was undertaken and, what seemed more important, was threatened in an unfair way: "You kids must line up so that I can find out who is the guilty one today, and beat the sin away from her."

Type 3. Paternal alcoholism was clearly associated with feelings of insecurity. Beating or quarreling were not as important as uncertainty about the future.

Type 4. Aryan discipline and exaggerated scholarly or academic expectations together with puritanical ethical norms and restrictions, many times highly religiously coloured were experienced as depressing and subordinating. "No success was ever good enough" was a typical sigh.

Type 5. An idiopathic group of 37% of the patients denied all negative impact of their parental home; furthermore, they often praised it as warm and empathetic.

It must be borne in mind, however, that all these findings were merely reported and not verified otherwise. They refer probably correctly to the feelings which the patients presently have towards their own life experiences.

The family history included childhood abuse in 61% of the patients, Fig. 1.

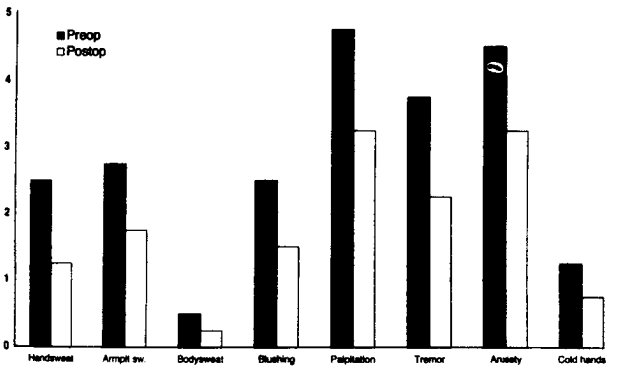

Fig. 2. Symptoms and their changes after left-sided sympathicotomy.

Left-sided sympathectomy, quantitative evaluation

In the pilot series ($n = 6$) and in two other patients due to pleural adhesions, only a left-sided operation was performed.

The results of these 8 patients after a follow-up of 3.5 months are shown in Fig. 2. Four of the patients were satisfied with the result. Three did not consider the benefit worth while, and one patient was not satisfied at all.

The only unsatisfied patient was disappointed because the planned bilateral operation proved to be impossible because of abundant, unforeseen pleural adhesions of unknown origin.

Prospective bilateral series, quantitative evaluation

The measured perceived symptoms were all significantly relieved. The sweating of the hands and armpits, the blushing, palpitation and anxiety, and the trembling of the hands and head, as well as the coldness of the hands were all highly significantly relieved. The Raynaud's sign of white fingers was relieved at a lesser significance level of $p < 0.004$. The compensatory sweating of the trunk (abdominal wall, back and chest) was increased but at a far lower significance level ($p = 0.027$).

Tables I–III show the changes in perceived symptoms graded from 0 to 5 as estimated according to a visual analogue scale (VAS), mean values $\pm$ SD (SE), before the operation and at the follow-up 4.02 $\pm$ 3.96 (SD) months later. Star (*) means that the change is statistically highly significant ($p < 0.001$).

All the perceived changes are shown in Fig. 3. The overall satisfaction of the patients is shown in Fig. 4.

None of the patients required reoperations, nor treatment for pneumo- or haemothorax, nor any further hospital stay. In three occasions, pleural adhesions were so abundant, that the operation on the right side was regarded as too dangerous by thoracoscopy. In one occasion the right-sided operation was performed at the same operation cervically, in the other two the operation was left unilateral; these two patients were not included in the prospective series.

DISCUSSION

Life history as a precursor to social phobia

In the present study many of the patients (47%) had suffered from mental cruelty as estimated by a qualitative inquiry. Cruelty varied from the religion-

Table I. *Changes in perceived sweating after bilateral sympathicotomy*

	Palmar sweating	Axillary sweating	Trunk sweating
Preoperative	3.1 ± 1.6 (0.25)	2.9 ± 1.3 (0.21)	1.3 ± 1.1 (0.18)
Postoperative	0.55 ± 0.78 (0.12)*	1.4 ± 1.0 (0.16)*	1.8 ± 1.5 (0.24)

Table II. *Changes in perceived blushing, palpitation and anxiety level after bilateral sympathicotomy*

	Blushing	Palpitation	Anxiety
Preoperative	3.7 ± 1.5 (0.24)	4.2 ± 1.0 (0.16)	4.2 ± 0.83 (0.13)
Postoperative	1.3 ± 1.0 (0.7)*	1.8 ± 1.3 (0.20)*	2.1 ± 1.3 (0.20)*

Table III. *Changes in perceived trembling of the hands and head, feeling of coldness or whiteness in fingers after bilateral sympathicotomy*

	Hand trembling	Head trembling	Cold fingers	Raynaud
Preoperative	3.3 ± 1.5 (0.23)	1.9 ± 1.7 (0.28)	2.58 ± 1.9 (0.30)	1.0 ± 1.5 (0.24)
Postoperative	2.4 ± 1.5 (0.23)*	1.1 ± 1.4 (0.23)*	0.88 ± 1.4 (0.22)*	0.38 ± 0.87 (0.14)

based restrictions, exaggerated scholarly or academic expectations, habitual family quarreling, constant threatening of beating, to threats of leaving the children parentless and on their own. Paternal alcoholism seems to have formed quite consistently a threat of insecurity in 26%. Direct violence was reported by 14% of the cases. Sexual abuse was not evident in our material, though it was not directly asked for. Childhood physical abuse has been noted to be higher among both men and women with anxiety disorders than among comparison women and higher among women with panic disorder than among women with other anxiety disorders (28). Also in agoraphobia, personality disorders, and panic disorder the pattern of family violence has been noted (17). In a study comparing the rates of developmental trauma in panic disorder, agoraphobia or social phobia, the sexual or physical abuse histories were significantly increased in all groups and most specifically associated with social phobia.

Social phobias have been associated with higher social class of the parental home, higher education, and higher scores on verbal intelligence, and a higher social class of the patient (18). In this study 86% of the patients had lower or higher academic education or respective skilled work and only 12% had no secondary school education; 12% had executive positions.

Our patient profile seems in accordance with previous investigations. It therefore seems reasonable to make some comments concerning the possible mechanisms that lead to social phobia. As already noted in the results section, the patients' life history can be classified into four characteristic and one idiopathic group.

A common denominator of the first three groups is insecurity, a permanent threat to life. The first three groups could be called

1. Quarrelsome, 2. Cruel, and 3. Alcoholic.

The fourth group is characterized by high religious and disciplinary expectations, a fitting name could be

4. Perfectionist.

In 5. Idiopathic group some features of group 4, perfectionist, obviously deriving from puritan origin —sheer kindness of heart — are evident, but no threat to life or cruelty.

Social phobia has been reported to cause a negative impact on work performance and to augment avoidant behavior, which together cause a severe negative impact on the overall quality of life (35). Even in the present study, many patients were in lower positions than their skill or education would have predicted, mainly because of their personal choice of solitary work to minimize personal contacts. Unemployment was, however, rare compared with the normal population.

Role of the sympathetics in social phobia

Patients with social phobia have been reported to have significantly higher plasma epinephrine levels than patients with panic disorder or normal controls

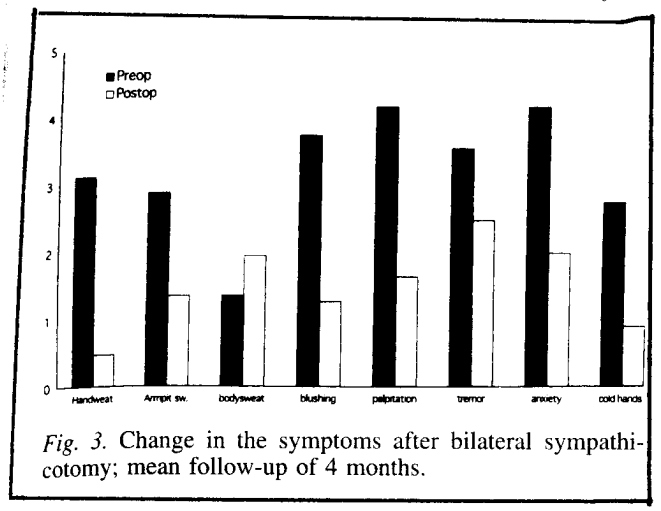

Fig. 3. Change in the symptoms after bilateral sympathicotomy; mean follow-up of 4 months.

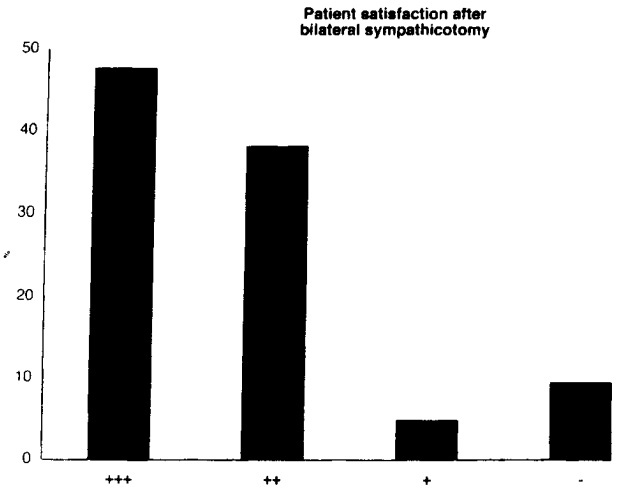

Fig. 4. Overall satisfaction after bilateral sympathicotomy; mean follow-up of 4 months.

(32). Originally, social phobia has even been postulated to be a separate sympathicotonic entity resulting from excessive sympathetic arousal (11). The phobic patients also seem to have a decreased heart rate variability suggesting altered cardiac autonomic control and hence increased risk of sudden cardiac death (24). On the other hand, it is known that sympathectomy prevents sudden cardiac death caused by overt sympathetic arousal (24). In this respect it is also understandable that there have been new attempts to treat angina pectoris* (13, 33, 36): Thus, it seems reasonable to treat with utmost care those people with social phobia who also have cardiac symptoms.

Postulate of the mechanism of action of sympathicotomy in social phobia

Sympathetic ablation of the upper thoracic segments relieves most of the symptoms and signs of sympathetic arousal, which is central in social phobia. Knowledge that the disturbing symptoms have gone helps just as much as cognitive-behavioural therapy does (10). Furthermore, it well may be that there exists an even more direct feedback inhibition of further sympathetic stimulation as in hypnotherapy aided biofeedback (25). Thus the pathway from sympathetic afferents to the locus coerulaeus and further to the frontolimbic connections would be decreased and further activation of dorsal raphe nuclei, epithalamic, and IV ventricular roof nuclei would be lacking or diminished. Thus a decrease of stimulating sympathetic efferents to target areas would result and also the overall sympathetic arousal reflex would be diminished (34).

CONCLUSION

Social phobia deserves increased attention as a potentially life threatening and most of all life quality decreasing disease entity. Whenever conservative means fail to give relief, or when there is an increasing risk of drug or alcohol abuse, surgical treatment should be considered by means of sympathetic ablation—video-assisted thoracoscopic sympathicotomy, which should be performed bilaterally. Thoracoscopic sympathicotomy should also be considered in particular in phobic patients with cardiac arrhythmia, decreased heart rate variability or long QT dispersion.

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