Endoscopic sympathectomy in the treatment of facial blushing

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ABSTRACT

INTRODUCTION Bilateral endoscopic thoracic sympathectomy (BETS) has been shown to be an effective, permanent, and safe treatment for severe upper limb hyperhidrosis. More recently, the possibility of using BETS to treat facial blushing, a redness of the face brought on by emotional or social stress, has been raised. This followed incidental reports from patients of relief from their blushing following this procedure for hyperhidrosis. At King's College Hospital, 120 patients underwent BETS over a 3-year period for both upper limb hyperhidrosis and facial blushing. In this study we report our results in relation to facial blushing.

PATIENTS AND METHODS The outcome was evaluated by questionnaire and symptoms assessed using the visual analogue scale. Questions on postoperative complications and overall quality of life were included.

RESULTS A total of 80 patients responded to our questionnaire of whom 59 (74%) experienced facial blushing. In 12 patients, this was their only symptom. Severity of facial blushing was reduced from a mean score of 78 before operation to 26 after BETS ($P < 0.001$); 29% reported complete resolution of their facial blushing. There was no mortality or conversion to open surgery. Quality of life was reported to be much better in 63% of facial blushers following the procedure.

CONCLUSIONS This study demonstrates both a statistically significant reduction in severity of facial blushing as well as a clear improvement in quality of life following a safe procedure with few complication rates. Facial blushing can, therefore, be considered as an indication for BETS on its own merit when not associated with hyperhidrosis.

KEYWORDS

Bilateral endoscopic thoracic sympathectomy – Facial blushing – Hyperhidrosis

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Thoracic sympathectomy has been known for many years to be an effective and permanent treatment for severe upper limb hyperhidrosis.^{1–5} Various studies have shown bilateral endoscopic thoracic sympathectomy (BETS) to be comparable to the open technique with the additional reduction in potential operative risks and morbidity, a shorter hospital stay and earlier return to work. BETS can, therefore, be regarded as the 'gold standard' treatment for hyperhidrosis.^{6,7}

More recently, the possibility of using BETS to treat facial blushing, a redness of the face brought on by emotional or social stress, has been raised. This possibility was borne from incidental reports from patients of relief from their facial blushing following BETS for hyperhidrosis.⁸ Facial blushing can be a devastating condition, which can significantly affect a person's quality of life; therefore, the possibility of cure or relief with a relatively simple technique is an exciting prospect.

At King's College Hospital, BETS is routinely carried out for both upper limb hyperhidrosis and facial blushing. In the following study, we report our results in relation to facial blushing over a 3-year period.

Patients and Methods

BETS was carried out on 120 patients between January 1998 and January 2001. T2–T3 thoracic sympathectomy was performed as previously described by Edmonson *et al.*⁶ The same consultant surgeon carried out all operations and used the same technique irrespective of symptom (*i.e.* hyperhidrosis or facial blushing). Patients were either admitted overnight or discharged later the same day following a postoperative chest X-ray.

Records of all patients undergoing BETS were identified through the theatre and hospital records and each patient was contacted by postal questionnaire. This questionnaire,

Table 1 Area affected by compensatory sweating

Area	Percentage affected
Back	79
Chest	43
Groin	30
Legs	19
Axillae	17
Stomach	13
Trunk	7
Feet	3
All body	3

which used a visual analogue scale of 0–100, assessed facial blushing before and after the procedure, hyperhydrotic symptoms and the development of compensatory sweating. Questions on postoperative complications (pain, Horner's syndrome, and pneumothorax), and overall quality of life using the 5-point Leikert scale were included.

All responses were entered into Microsoft Excel for analysis. Statistical analysis of normally distributed data was performed by *t*-test and paired *t*-test, as appropriate.

Results

A total of 80 patients, with an age range of 8–52 years, responded to the questionnaire; 59% were female and the mean follow-up was 20 months. Nine of the responders were children aged 8–16 years. In this group 8/9 (89%) were female.

Of the responders, 59 (74%) experienced facial blushing. In 12 patients this was their only symptom; however, 47 had associated hyperhydrosis, which was mainly palmar or axillary in distribution. Twenty-one (26%) patients experienced hyperhydrosis with no facial blushing.

In all the children undergoing BETS, the predominant symptom was that of palmar/axillary hyperhydrosis with only 2 reporting some degree of accompanying facial blushing

Outcome of primary symptoms

In 59 patients with facial blushing, the severity score was reduced from a mean score of 78 (SD 32) to 26 (SD 27.6) after BETS ($P < 0.001$). In the 21 patients who underwent BETS for hyperhydrosis with no associated facial blushing, the severity score was reduced from a mean score of 95 (SD 10.1) to 12 (SD 18.0) following surgery ($P < 0.001$). The improvement in hyperhydrosis following BETS was similar in the children with their severity score reduced from a mean score of 97.8 to 28.5.

Table 2 Quality of life following BETS

Quality of life	Hyperhydrosis (<i>n</i> = 21)	Facial blushers (<i>n</i> = 59)
Much better	14 (66%)	37 (63%)
Some improvement	1 (4.7%)	9 (15%)
Same	1 (4.7%)	5 (8%)
Worse	4 (19%)	8 (13%)

Seventeen patients (29%) reported complete resolution of their facial blushing; this included both children. Eleven patients reported no change in their symptoms and only one felt their blushing had become worse postoperatively. The remaining 30 patients had documented improvement in their symptoms.

Compensatory sweating

This was similar in both groups, with 54/59 (91%) of the facial blushers and 17/21 (81%) of the pure hyperhydrotics experiencing compensatory sweating postoperatively. Rates were slightly lower in the children with only 4/9 (44%) reporting compensatory sweating. The most commonly affected areas were the back and chest (Table 1). Interestingly, gustatory sweating was reported by 19/59 (32%) facial blushers and 7 of the 21 (33%) patients treated for pure hyperhydrosis. The onset of sweating varied between 24 h and 12 months postoperatively, most commonly starting at week 4 postoperatively. Ten patients had consulted a doctor regarding their compensatory sweating.

Complications

No postoperative mortality occurred and there were no major complications requiring surgical intervention. Transient chest pain was experienced by 68 (85%) of all responders ranging from 24 h to 6 weeks in duration. In the facial blushing group, 52 patients suffered postoperative chest pain, 5 requiring a chest drain and 2 experiencing transient Horner's syndrome. In the 21 patients with no facial blushing, 16 experienced chest pain, 2 required a chest drain and 1 suffered from transient Horner's syndrome.

Quality of life

Of the 59 patients suffering from facial blushing, 37 (63%) reported their overall quality of life to be much better, 9 (15%) noted some improvement, 5 (8%) felt there had been no change and 8 (13%) reported their quality of life to be worse. This was again comparable with the hyperhydrosis group (Table 2). All 9 children reported overall quality of life to be much better following the procedure.

Discussion

For many years primary hyperhidrosis, a condition of unknown aetiology, has been recognised as having the potential of causing devastating affects to the sufferer's quality of life.^{1,2,9,10} Various treatments have been used from topical agents and medical treatments such as anticholinergics and iontophoresis to psychotherapy with varying success.² Various surgical techniques have also been described such as excision of axillary sweat glands and thoracic sympathectomy, which was carried out as early as the 1920s¹⁰ initially as an open procedure but more recently laparoscopically.²

An equally disabling condition is one of facial blushing. This response can be elicited by various stimuli; however, severe blushing brought on by emotional or social stimuli can often have a serious impact on the person leading to social phobias, avoidance behaviour, substance abuse and suicidal ideation.⁸ Facial blushing is caused by vasodilation of cutaneous blood vessels innervated by the upper thoracic sympathetic chain.¹¹ It could, therefore, be expected that ablation of these ganglia would provide relief from this symptom.

Drott *et al.*⁸ demonstrated that facial blushing was improved in patients undergoing the procedure for the recognised indication of upper limb hyperhidrosis. Our study confirms the high frequency with which facial blushing and hyperhidrosis co-exist (74% in this series), and demonstrates the effectiveness of this procedure in patients suffering from facial blushing.

In this study, 12 patients had facial blushing alone; all 12 noted improvement in their blushing postoperatively with 4 experiencing complete resolution of symptoms. We, therefore, provide a case for offering BETS to patients suffering from facial blushing alone, not only when accompanied by the common indication of hyperhidrosis.

Compensatory hyperhidrosis which has long been recognised as a complication of sympathectomy occurred in 91% of patients with facial blushing which is similar to the incidence reported by previous authors^{6,8,12} though slightly higher than in other studies.^{4,5,15} Interestingly, 26 patients developed facial sweating; of these, 19 (32%) related this symptom to food (gustatory sweating) which is comparable to previous studies that report rates of 48–50%.^{6,12} Therefore, a significant number of patients will develop facial sweating despite being cured of their facial blushing. This possibility and the high incidence of compensatory sweating should be discussed with the patient during the consent process. This is particularly relevant to facial blushers who may be trading flushing for sweating and, therefore, have a significant impact on their life.

Conclusions

This study confirms the previously documented success of BETS in the treatment of hyperhidrosis and shows that the reduction in symptoms following the procedure is comparable in the group of patients being treated for facial blushing and the conventional group which undergo the procedure for hyperhidrosis.

Our study also demonstrates the relative safety of this procedure and low complication rates with figures for postoperative pneumothorax and Horner's syndrome being comparable to previous studies.^{1,4,6,15} This is an important point when the majority of patients are young and otherwise well.

We have been able to demonstrate that BETS provides relief from facial blushing with a clear improvement in quality of life for these patients. Facial blushing can, therefore, be considered as an indication for BETS on its own merit when not associated with hyperhidrosis. However, patients must be counselled about the possibility of compensatory sweating and, specifically, facial sweating before informed consent is given.

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