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THORACOSCOPIC SYMPATHECTOMY FOR PRIMARY PALMAR HYPERHIDROSIS

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Primary palmar hyperhidrosis is a pathological condition of excessive perspiration of unknown aetiology. It causes severe emotional, occupational and social handicaps at an early age.

A variety of treatment methods are used to control or reduce the profuse sweating which involves, mainly the plams and axillae. Sympathectomy remains the standard by which other treatment must be judged. For thoracic sympathectomy a variety of surgical approaches are used. This study evaluates the thoracoscopic approach.

Patients and Methods: Between August 1999 and November 2001, 41 patients underwent bilateral T2 sympathectomy for an isolated palmar hyperhidrosis (n=29) and T3-4 sympathectomy simultaneously for a combined axillary hyperhidrosis (n-12).A preoperative chest radiograph is essential to exclude pulmonary pathology. The patients are anaesthetized using a double lumen endotracheal tube.

Results: Fourty one patients included in our study. There were 30 males and 11 females of mean age 21.3 years (range 14-32 years). The area affected before operation were hands alone in 29 patients (70.7%) and both hands with the axillae in 12 patients (29.2%). Eight patients (19.5%) have a positive family history. In all patients, immediate dry hands were recorded. There was no mortality and no serious morbidity. Horner's syndrome occurred in 1 patients (2.4%). It resolved in 6 weeks. Surgical emphysema in 2 patients (4.8%). Pneumothorax in one patient (2.4%) who need reinsertion of the intercostal tube. Compensatory hyperhidrosis (CH) developed in 9 patients (21.9%) within 6 months after surgery. The primary areas of CH were the upper back (55%), buttock (52%), and the anterior chest (45%) in developing orders. 6 of 9 patients experienced spontaneous improvement in CH within 9 months of operation. No recurrence was noted during the follow-up period of one year duration.

Conclusion: Thoracoscopic sympathectomy has now stood the test of time. It is easier to perform, and so safer than open procedures. It is far more comfortable for the patients, cosmetically superior and costs less. However, patients should be advised of the possibility of compensatory hyperhidrosis.

Keywords: Hyperhidrosis, thoracoscopic sympathectomy, compensatory hyperhidrosis

INTRODUCTION

Hyperhidrosis is a pathological condition in which sweating occurs in excess of that required for thermoregulation [1]. It can be very distressing and a source of intense embarrassment, interfering with social and work commitments[2].

It may be primary, with no obvious underlying cause, or secondary to a variety of neurological or systemic diseases such as thyrotoxicosis, obesity, anxiety states and the menopause or it may occur in paroxysms in association with phaeochromocytoma [3]. Epidemiological data are few, but Adar et al., [4] suggest an incidence of 0.6 – 1.0 percent [4]. Primary hyperhidrosis usually appears in childhood and persists for life [5].

Patients with palmar hyperhidrosis are reluctant to shake or hold hands and may become socially withdrwan. They are unable to grasp objects, papers become wet, ink runs and metals rust [6]. Axillary hyperhidrosis is socially embarrassing, causing wetness, staining and rotting of clothing [6].

The management of hyperhidrosis remains controversial [7]. Medical treatment is effective only in the mildest cases. Biofeed back techniques have been used with limited success. Treatment with iontophoresis is messy and time consuming with short-lived effect [8]. Local excision of sweat glands has a role only where the disease is confined to axilla [3].

Sympathectomy remains the cornerstone of surgical management. Various operative approaches have been described, each with its advocates: the cervical or supraclavicular approach and the posterior approach [7]. Kux in 1978[9] described an endoscopic approach.

PATIENTS AND METHODS

Between August 1999 and November 2001, 41 patients underwent bilateral T2 sympathectomy for an isolated palmar hyperhidrosis (n=29) and T3-4 sympathectomy simultaneously for a combined axillary hyperhidrosis (n=12).

They were 30 males (73.1%) and 11 females (26.9%) of mean age 21.3 years (range 14-32 years). Nine patients (21.9%) reported a family history of hyperhidrosis. All patients had been referred with incapacitating hyperhidrosis which interferred with their work and with social activities. Routine laboratory and radiological tests including full blood count, urea, blood sugar, thyroid function studies and chest radiography, were carried out on all patients to perclude an underlying cause. All were carefully counselled on potential complications of the operation such as postoperative pain, pneumothorax and compensatory hyperhidrosis. Patients with a clinical history suggesting pleural adhesions or radiological evidence of pleural thickening were excluded.

Table (1): ***Bilateral thoracoscopic sympathectomies were done sequentially or simultaneously***

	No of patients	Percentage
Sequentially	35	85.3%
Simultaneously	6	14.7%

The procedure was performed under general anasthesia using a double lumen endotracheal tube. The patient was placed in supine position with both arms abducted to 90. Blood pressure and heart rate were monitored throughout. An artificial pneumothorax was established by insufflating 0.5 liters of carbon dioxide through a Veress needle in the fourth intercostal space, having first disconnected the ipsilateral portion of the endotracheal tube from the ventilator. A small incision was made in the fourth intercostal space in the anterior axillary line and a Storz laparoscope (lenz 0) was introduced through a cannula and more carbon dioxide was introduced and the upper lobe of the lung was observed as it collapsed. Flimsy adhesions were cut with diathermy scissors but major apical adhesions could render the operation impossible. The sympathetic chain was usually visualized under the parietal pleura running down over the necks of second, third, fourth and fifth ribs (Fig. 1). The pleura over the sympathetic chain should not be palpated with endoscopic instruments because this causes hyperemia and obscures visualization.

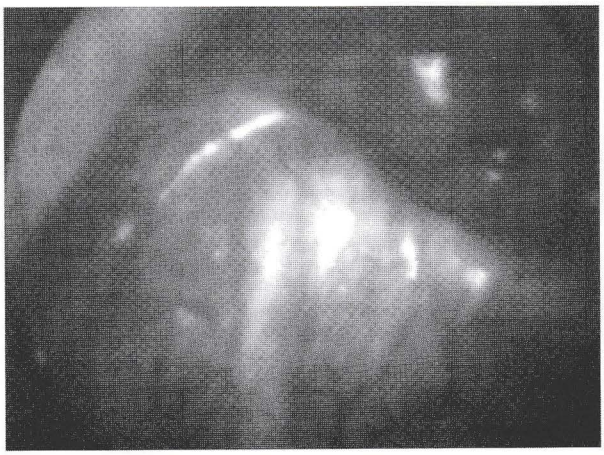

Fig. (1): The sympathetic chain was visualized under the parietal pleura

A unipolar diathermy probe was inserted through a separate stab incision, in the midclavicular line, in the 5th intercostal space. If the chain was not easily seen due to subpleural fat it could be located by stroking the diathermy probe along the neck of the rib. The chain was then felt and seen as it slipped out from under the tip of probe. The pleura over the chain was incised with diathermy and the second, third and fourth thoracic ganglia and intervening chain were electrocoagulated untill they presented a charred appearance. The stellate ganglion could not be seen as it is covered by a characteristic yellow fat pad which enveloping the subclavain artery. The nerve of kuntz, a large branch that extends caudally from the stellate ganglion, is also found within the fat pad. The stellate ganglion should remain undisturbed to avoid injury that can result in Horner's syndrome. The sympathetic chain was excised and sent for histopathological evaluation. The dissection bed is irrigated and assured for hemostasis, and a 20 french chest tube is inserted through one of the ports and positioned endoscopically. The instrument ports are then removed sequentially, The lung is reinflated by anaesthsiologist, and the port incisions are closed in two layers.

The chest tube is placed on water seal and immediate chest x-ray film is obtained to verify the absence of pneumothorax. It was removed either the next day or possibly the same day. Oral analgesics are adequate for pain control, and the patient was discharged after 2 days. The patient was admitted after 2 weeks to repeate the procedure on the opposite side.

The procedure could be repeated on the opposite side under the same anaesthetic. It is important, however, to monitor pulse rate and blood pressure carefully throughout the procedure to guard against pneumothorax, and the carbon dioxide line pressure should not exceed 10 cm H2O.

RESULTS

Thoracoscopic sympathectomy was used successfully to treat 41 patients with primary palmar hyperhidrosis either in isolation (n=29) 70.7% or in combination with axillary hyperhidrosis (n=12) 29.3%. Dry hands were immediately achieved in all patients after surgery (100%), with improvement of axillary hyperhidrosis in 11 of 12 patients (91.6%).

Table (2): ***Immediate outcome in 41 patients with hyperhidrosis***

Symptom	*Relief of symptoms*	*%*	*Unrelief of symptoms (n)*
Palmar hyperhidrosis	29 /29	100	0
Axillary hyperhidrosis	11/12	91.6	1

Table (3): *Sites affected by hyperhidrosis*

Site	*No*	*Percentage*
Palmar hyperhidrosis	29	70.7%
Axillary hyperhidrosis and palmar hyperhidrosis	12	29.3%

Table (4): *Complications after operation*

Complication	*N*	%
Compensatory hyperhidrosis	9	21.9%
Surgical emphysema	2	5%
Pneumothorax	1	2.5%
	1	2.5%
Wound infection	1	2.5%

Table (5): *Areas of compensatory hyperhidrosis*

Area	%
Upper back	55%
Buttock	52%
Anterior chest	45%

The complications after operation were listed in (Table 4).

Compensatory hyperhidrosis (CH) developed in 9 patients (21.9%) within 6 months after surgery. The primary areas of CH were the upper back (55%), buttock (52%) and the anterior chest (45%) in developing orders (Table 5). Six of 9 patients (66.6%) experienced spontaneous improvement in CH within 9 months of operation. The procedure was done sequentially (2 weeks apart) in 35 patients (85.3%), while simultaneously in last 6 cases (14.7%) (Table 1). The operation took 15 ± 5 minutes. No recurrence was noted during the follow-up period of 1 year.

DISCUSSION

Palmar hyperhidrosis, often underestimated, is a disabling but not life-threatening condition. Conservative treatment with anticholinergic drugs, topical aluminum chloride hexahydrate, or injection of botulinum toxin offers only minimum and temporary relief [2,10,11]. Thoracic sympathectomy is the classic mean of treating palmar hyperhidrosis and a variety of approaches have been described, including the posterior paraspinal, open thoracotomy, and thoracoscopy. With advancement in video assisted endoscopic technique, the thoracoscopic approach has undergone rapid progression and is now widely accepted as the approach of choice since first described by Kux, in (1978)[9]. Thoracoscopic sympathectomy is a minimally invasive procedure with several advantages over open surgery in the treatment of palmar and axillary hyperhidrosis. It is quick and easy to perform. It provides excellent visualization of the sympathetic chain, and the stellate ganglion lying beneath a fat pad is relatively protected. Post operative pain, a feature particularly of the axillary approach, is minimized, and a difficult dissection, as in the cervical approach, is avoided. The duration of hospital stay is reduced to a minimum (two days).

The optimal procedure, sympathicotomy (electrocautery) or sympathectomy (excision) has remained

a controversy because these different procedures influence the strategic planning of the access ports as excision requires usually three ports, whereas electrocautery ablation can be performed with dual puncture approach. Another remaining concern is neural regeneration with recurrence of symptoms when the sympathetic trunk is cauterized and not resected. There were studies to compare two thoracoscopic procedures: sympathectomy and sympathictomy for hyperhidrosis. Kuda et al., 1998.[12] reported that there was no difference in recurrence between the sympathictomy and sympathectomy [12].

Our results showed no difference and no recurrence during the follow up period. Most complications resulting from thoracoscopic sympathectomy are minor, and self limited, and have no permanent clinical impact. They may be avoided by meticulous surgical technique.

The major complication is clear-cut Horner's syndrome. It differs from other complications due to severe functional and aesthetic disturbance to the patient. The incidence in literature varies between zero and 12 percent; the incidence in this study was (2.4%) [13]. It was transient, the improved visualization with thoracoscopy would theoretically reduce the incidence of horner's syndrome by providing identification of the stellate ganglion and allowing for avoidance of the fibers ascending from the stellate, which innervate the ocular pupillary muscles, dividing the rami caudal to stellate, providing sympathetic innervation to upper limb.

Resection of the T1 part of the stellate ganglion has been implicated as being responsible for this complication, but Horner's syndrome has been reported by many authors who resect only the T2-T3 ganglia [14].

Violent manipulation of the sympathetic chain, damaging efferent fibers from the upper part of stellate ganglion, is probably the cause for this complication in the majority of cases, rather than resection of the T1 portion of the ganglion.

CH is an unexplained increase in prespiration occuring in other parts of body following upper dorsal sympathectomy. It is the supposed result of a compansatory mechanism. The occurrence of this complication is unpredictable it has been observed in about one-quarter to two-thirds of cases [15].

It may begin within 6 months of sympathectomy, but its severity may also decrease spontaneously within 9 months in some patients.

In our study (21.9%) of patients were affected, 6 of 9 patients (66.6%) improved spontaneously.

Chen in 1998,[16] evaluated CH as the price to pay for the relief of palmar hyperhisdrosis and an inevitable complication [16]. Some authors reported that compensatory sweating is less severe in sympathicotomy than sympathectomy[12].

To reduce CH some surgeons advocated the modified or limited ganglionectomy (partial destruction of the main ganglion at T2), others recommended a T3 sympathicotomy [17].

Others reported that the incidence and severity of CH is not related to the extent of severed sympathetic chain if sympathicotomy is not beyond the fourth ganglion [3&16].

The limited ganglionectomy carries the potential risks of surgical failure and recurrence [2].

The opposite effect, namely decrease of sweating in other parts of body, has also been observed in some reports but not in our study [4].

Phantom sweating: the subjective feeling of impending hyperhidrosis in the palms without actual sweating was reported in some studies [4].

It was not reported in our study. It was not mentioned in reports of other large series [18].

Other complications expected such as muscular dystrophy, gustatory sweating, and possible denervation effects on the cardiac and respiratory system were not found in the present study [19&20].

CONCLUSION

Thoracoscopic sympathectomy is considered as a minimal invasive surgery. It is safe, simple easy to perform and effective. It is more comfortable for the patient and cosmetically superior. It has now stood the test of time. However, patients should be advised of the possibility of CH.

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