

THORACOSCOPIC SYMPATHECTOMY: EL-MINIA EXPERIENCE.

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The endoscopic upper thoracic sympathectomy, amply documented by Kux 1954, did not gain wide spread popularity until 1980. Preservation of the stellate ganglion is advocated nowadays to minimize the risk of Horner's syndrome as resection of T₂ through T₄ including the chain in between and any direct branches to the brachial plexus including nerve of Kuntz is enough. Compensatory hyperhidrosis and Horner's syndrome are uncommon after limited thoracoscopic sympathectomy. Patients and Methods: In the period from October 2000 till February 2003, a total of 75 thoracoscopic sympathectomies in 55 patients were done. They were suffering from primary hyperhidrosis either palmar, axillary or both (40 patients), Raynaud's disease (10 patients) or both (5 patients). We used two ports, 10 mm port in the 4th space in the mid-axillary line for the telescope and the other is 5mm in the 3rd space in the mid-axillary line for the dissector. The sympathetic chain was resected from T₂ to just below T₄. Results: There were no intra-operative complications. Resection of the chain and ganglia was done easily using the electrocautery. The 2nd thoracic ganglion was found in the 2nd space in all cases and there was a well formed stellate ganglion in only 59 sides, in the rest of the sides the 1st thoracic ganglion was small and seen on the upper border of the 2nd rib. Surgical emphysema was encountered in 4 patients (7.3%), 3 of them were managed conservatively while the remaining one needed insertion of an intercostal tube. One patient (1.8%) developed pneumothorax, it was managed by intercostal tube insertion. We reported no cases of Horner's syndrome. Compensatory hyperhidrosis of the trunk and lower limbs was encountered in 21 patients (38.2%) but it was mild and needed no surgical intervention. Recurrence of symptoms was encountered in 7 patients in the Raynaud's disease group (70%). Four out of five patients (80%) with both vascular and sweating symptoms developed recurrence of their vascular symptoms after 8 to 10 months. Conclusion: Thoracoscopy is the ideal approach for cervicodorsal sympathetic ganglia, so the thoracoscopic sympathectomy is the treatment of choice for palmar and axillary hyperhidrosis. In peripheral vascular diseases, sympathectomy must be reserved for cases that will not benefit from direct arterial surgery as recurrence after sympathectomy is the fate in most cases

Key words: Thoracoscopy, Sympathectomy, hyperhidrosis, vasospastic diseases

INTRODUCTION

In the early 1920s, it was clarified that patients with hyperhidrosis, vasospastic conditions and angina pectoris would benefit from stellectomy. It was, however, soon discovered that removal of the upper thoracic ganglia was required in order to obtain complete sympathetic denervation of the upper limb. Several surgical approaches for upper thoracic sympathectomy were described, supra-clavicular, trans-axillary, dorsal midline (preferred by neurosurgeons) and extra pleural approach through transaxillary resection of the first rib (advocated by the vascular surgeons).⁽¹⁾

The endoscopic approach, amply documented by Kux 1954, did not, however, gain wide spread popularity until 1980. Like the general upsurge of interest in endoscopic surgery, surgeons now rapidly adopt thoracoscopic ablation of the upper thoracic sympathetic ganglia. Not only the approach but also the extent of handling of the sympathetic chain is varying from preganglionic transection, ganglionectomy to resection of the chain which may be limited (T_{2, 3}) or extended from the lower part of Stellate ganglion till T₄₋₆.⁽²⁾

Preservation of the stellate ganglion is advocated nowadays to minimize the risk of Horner's syndrome as resection of T₂ through T₄ including the chain in between

and any direct branches to the brachial plexus including nerve of Kuntz is enough. Compensatory hyperhidrosis and Horner's syndrome are uncommon after limited thoroscopic sympathectomy.⁽³⁾

Arterial insufficiency of the hands may be due to vascular spasm as in Raynaud's or to vascular occlusion. The arteries in the skin of the hands are known to be under continuous influence of the sympathetic nervous system. Omission of this influence by thoracic sympathectomy results in improvement of the skin microcirculation in the hands both in patients with vascular spasm and those with occlusion.⁽⁴⁾

PATIENTS AND METHODS

In the period from October 2000 till February 2003, a total of 75 thoroscopic sympathectomies in 55 patients (20 males and 35 females) were done. They were suffering from primary hyperhidrosis either palmar, axillary or both (40 patients), Raynaud's disease (10 patients) or both (5 patients).

We used double lumen endo-tracheal tubes in 20 patient and single lumen endo-tracheal tubes in the rest 35 patients. We used two ports, 10 mm port in the 4th space in the mid-axillary line for the telescope and the other is 5mm in the 3rd space in the mid-axillary line for the dissector. The sympathetic chain was resected from T2 to just below T4 with sacrifice of all nerve fibers coming in or out of the chain. Stellate ganglion was searched for and left untouched in all cases. We left an intercostal tube with underwater drainage in 20 (10 with bilateral procedure and 10 with unilateral procedure) while in the rest of the patients we closed the sites of the ports after inflation of the lung without intercostal tube. Chest X-ray was done routinely 6 hours postoperatively to assure complete inflation of the lung.

Follow-up was done every month for 2 visits and then every 3 months for two years. Ten patients were lost for follow-up after 6 months. Follow-up was done through direct questions and clinical examination

RESULTS

A total of 75 cervicodorsal sympathectomies were

done in 55 patients because of a variety of indications (40 patients with primary hyperhidrosis, 10 with Raynaud's disease and 5 patients presented with both). In hyperhidrosis group, there were 15 males (37.5%) and 25 females (62.5%). In Raynaud's disease group males were 2 (20%) and females were 8 (80%). Patients who presented with both vascular and sweating problems were 3 males (60%) and 2 females (40%) (Table 1).

Twenty patients underwent bilateral procedures in the same session using double lumen endotracheal tube, while the rest of the patients underwent unilateral sympathectomy using single lumen endotracheal tube (Table 2).

There were no intra-operative complications. Identification of the sympathetic chain was feasible in all cases. Resection of the chain and ganglia was done easily using the electrocautery. The 2nd thoracic ganglion was found in the 2nd space in all cases and there was a well formed stellate ganglion in only 59 sides, in the rest of the sides the 1st thoracic ganglion was small and seen on the upper border of the 2nd rib.

Postoperative complications were mild and dealt with easily. Surgical emphysema was encountered in 4 patients (7.3%), 3 of them were managed conservatively while the remaining one needed insertion of an intercostal tube. One patient (1.8%) developed pneumothorax, it was managed by intercostal tube insertion. Superficial wound infection of the port site occurred in 2 patients (3.6%), they are managed by daily dressing and oral antibiotics. We reported no cases of Horner's syndrome. Compensatory hyperhidrosis of the trunk and lower limbs was encountered in 21 patients (38.2%) but it was mild and needed no surgical intervention (Table 3).

Recurrence of symptoms was encountered in 7 patients in the Raynaud's disease group (70%), the symptoms began to redevelop after a period ranged between 6 and 12 months. In 1ry hyperhidrosis group, 2 patients (5%) developed recurrence of their symptoms after 18 months. Four out of five patients (80%) with both vascular and sweating symptoms developed recurrence of their vascular symptoms after 8 to 10 months (Table 4).

Table 1: Presentation and sex distribution

	Male	Females
Hyperhidrosis	15	25
Raynaud's disease	2	8
Both	3	2

Table 2: Type of procedure in each group of patients

	<i>Bilateral</i>	<i>Unilateral</i>
<i>Hyperhidrosis</i>	18	22
<i>Raynaud's disease</i>	2	8
<i>Both</i>	-	5

Table 3: Postoperative complications

	<i>No. (%)</i>	<i>Management</i>
<i>Horner's syndrome</i>	-	-
<i>Compensatory hyperhidrosis</i>	21 (38.2%)	Mild in all cases/ treated conservatively
<i>Pneumothorax</i>	1 (1.8%)	Insertion of intercostals tube
<i>Wound infection</i>	2 (3.6%)	Daily dressing and antibiotics
<i>Surgical emphysema</i>	4 (7.3%)	3 cases passed conservatively while 1 case needed intercostals tube

Table 4: Incidence of recurrence

	<i>Try hyperhidrosis</i>	<i>Raynaud's disease</i>	<i>Both</i>
<i>Recurrence</i>	2(5%)	7(70%)	4(80%)
<i>After</i>	18 months	6-12 months	8-10 months

DISCUSSION

The thoracoscopic approach to the sympathetic chain appears to be much more superior to the traditional supra-clavicular, trans-axillary or posterior approaches because thoracoscopy provides an excellent exposure of the sympathetic chain with minimal operative dissection and post-operative pain resulting in rapid recovery of the patient.⁽²⁾

All patients with palmar or axillary hyperhidrosis developed immediate dry palms or axillae. During the follow-up two of them reported recurrence of symptoms. Lowell et al 1993, report that almost all patients underwent cervico-thoracic sympathectomy for peripheral arterial disease showed initial improvement but after six months all patients have residual or recurrent symptoms.⁽³⁾

In our series, 10 patients with Raynaud's syndrome underwent endoscopic sympathectomy; all of them reported immediate improvement in symptoms. After a period ranging from 6 to 12 months, seven of them regained some or all of their pre-operative manifestation.

The incidence of the Horner's syndrome after

thoracoscopic sympathectomy varies from 0 to 9.7% with a direct proportional relationship with the extent of sympathectomy.^(5,6) The occurrence of Horner's syndrome is generally dependant upon the amount of the Stellate ganglion resected. Since fibers to the upper extremity are known to course through the Stellate ganglion, resection of all or a part of it was previously believed to be necessary for a complete sympathectomy.⁽⁷⁾

However, most surgeons nowadays advocate preservation of the Stellate ganglion to minimize the risk of Horner's syndrome, so resection of T₂ through T₄, including the chain in between and any direct branches to the brachial plexus including nerve of Kuntz seems to be satisfactory.⁽²⁾

This agrees with our results as we restricted our resection to the T₂ - T₄ and we reported no cases of Horner's syndrome postoperatively. Again limited sympathectomy (T₂ - T₄) doesn't appear to affect the efficacy of the procedure.

Compensatory hyperhidrosis of the face, trunk or legs is experienced by 48-68% of the patients after surgical sympathectomy.^(8,9) In our series, only 38.2% of our patients (21 patients) developed compensatory hyperhidrosis. It was

tolerable in all cases. We need more cases to assure that limited T₂ - T₄ sympathectomy is definitely associated with smaller incidence of compensatory hyperhidrosis.

CONCLUSION

Thoracoscopy is the ideal approach for cervicodorsal sympathetic ganglia, so the thoracoscopic sympathectomy is the treatment of choice for palmar and axillary hyperhidrosis. In peripheral vascular diseases, sympathectomy must be reserved for cases that will not benefit from direct arterial surgery as recurrence after sympathectomy is the fate in most cases. Limiting the sympathectomy to the T₄₋₂ doesn't affect the results of the operation but minimizes the side effects of the maneuver. The anatomical variation in position of the ganglia - especially T₂ - is rare and this will help in direct approaching the ganglia with save preservation of the stellate one.

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