Case Report
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Chemical Lumbar Sympathetic Block after Failed Endoscopic Lumbar Sympathectomy in Plantar Hyperhidrosis

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Abstract

We describe the successful use of Chemical Lumbar Sympathetic Block (CLSB) with alcohol after failed Endoscopic Lumbar Sympathectomy (ELS) with clips in Plantar Hyperhidrosis (PH). These cases highlight the practical application of CLSB for patients who require substitute treatment after failed ELS. CLSB provides a significant contribution to the wellbeing of patients, having proven to be safe and effective in the long-term treatment of PH.

PH is a common condition affecting 1-3% of the population with a family history of the disease, which suggests a genetic basis [1]. It usually starts in childhood or adolescence and causes substantial physical limitations, including a predisposition to fungal and bacterial infections, strong odour, and friction blisters. Both feet and genders are equally affected, and PH is also associated with sweating of the hands, axillae, face, and scalp. The condition can be very serious and stressful due to its impact on quality of life and as a cause of social embarrassment. Treatment methods cover a range from topical treatments to surgery, including options of topical and systemic agents, iontophoresis, botulinum toxin injection, and lumbar sympathectomy as the last resort; however, the condition remains challenging.

Sympathectomy has been performed since 1920 in patients with incapacitating, refractory hyperhidrosis. Although the procedure is generally known to be highly successful, with a resolution of 92% in lumbar sympathectomy [2], it is irreversible and therefore should be considered only after all other therapeutic options have been exhausted. The risk of permanent sexual dysfunction limited the usefulness of lumbar sympathectomy for the treatment of PH for a long time. Nevertheless, recently, lumbar sympathectomy has been performed safely and severe cases of PH effectively treated by ELS using the clamping method have been reported [2,3]. Reisfeld et al., [3] reported that ELS was performed on an outpatient basis in a large series of consecutive patients and was found to be associated with low morbidity and complete resolution of symptoms (97.4%), resulting in a significant improvement in quality of life. In spite of the great success of ELS, some patients experienced partial/total recurrence, surgical complications, and Compensatory Sweating (CS) for which they resisted surgical revision. Accordingly, CLSB is indicated when patients require an alternative treatment after failed ELS.

Keywords: Plantar; Hyperhidrosis; Sweat; Lumbar sympathetic block; Sympathectomy

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Case Presentation

Case 1

A 28-year-old female presented to our pain-hyperhidrosis clinic with concerns about her feet sweating and malodour, which she reported had commenced with puberty. She had no remarkable disease or other relevant medical history, but had a family history of hyperhidrosis. She described the sweating from her hands, axillae, and both feet with odour as 'foul'. Her quality of life was severely affected, with a Dermatology Life Quality Index score of 18 and Hyperhidrosis Disease Severity Scale score of [4]. An iodine-starch test was not accepted. She had previously visited a surgical clinic for hyperhidrosis and had been prescribed medication, but her sweating and malodour persisted. ELS were performed to reduce plantar sweating and malodour 3 years previously. Her feet were dry during the first week, but both feet were soggy despite the previous surgery. Mild CS appeared on her chest, back, groin, and buttocks. She revisited the surgical clinic for evaluation and was advised reoperation, but she refused further operations because of neuralgia, no guarantee of success, and

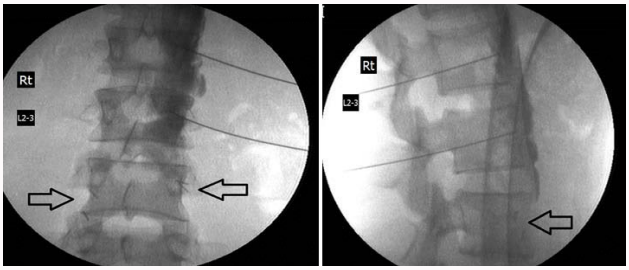

Figure 1 and 2: Injections of contrast dye and metal clips (empty arrows) are shown during chemical lumbar sympathetic block (L2 and L3) in anteroposterior and lateral views of female patient.

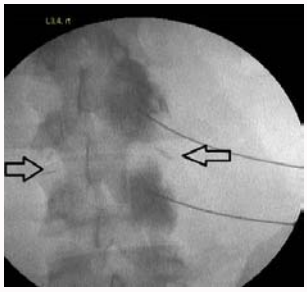

Figure 3: Fluoroscopic view (anteroposterior view) shows the needle in position, the spread of longitudinal contrast dye at L3 to L4, and metal clips (empty arrows) marked after bilateral endoscopic lumbar sympathectomy in male patient.

fear of heavy CS. Anticholinergic drugs did not relieve her severe sweating and malodour. Botulinum toxin injections were refused due to limited time effects and cost.

We performed CLSB and the detailed technical procedure is described elsewhere [4]. In summary, patients are placed in the prone position with skin temperature probes attached to the dorsum of the foot to monitor temperature change. Fluoroscopy was used to confirm the entry point of the 12 cm needle according to lateral (Reid's) technique. A skin wheal was made at the entry point 6.5 cm lateral to the superior border of the spinous process of lumbar spines. The needle was slipped to the anterolateral border while maintaining close contact with the lateral side of the vertebral body. A small amount of contrast dye was injected to confirm the spreading pattern of the contrast dye and to adjust the position of the needle tip. The same procedure was repeated at a different level of the lumbar vertebrae and on the opposite side with the two-needle technique on another day. The position of the needle tip and distribution of dye were verified by injection of a mixture of radiopaque dye (1.5 mL) and 4% lidocaine (1.5 mL) at each level of the vertebrae and subsequently confirmed by an anteroposterior and lateral X-ray of the lumbar spine. Figure 1 and 2 an increase in the skin temperature of more than 2°C was considered to indicate successful sympathetic block. Sensory and motor functions were checked and anhydrous 99.9% ethyl alcohol was injected (3 ml at each level) after confirmation of a temperature increase and a normal neurologic examination. She was very satisfied with the obtained anhidrosis and no malodour during the 12 months of follow-up. Her quality of life was markedly improved without procedural complications or CS during daily activity. The Dermatology Life Quality Index score was significantly decreased to 7 and Hyperhidrosis Disease Severity Scale score to 1 after CLSB treatment.

Case 2

A 35-year-old male patient visited the pain-hyperhidrosis clinic for evaluation and treatment of PH. He had no specific disease but had palmar, plantar, and axillary hyperhidrosis. Thoracic sympathectomy and ELS had been performed to reduce hand and feet sweating 11 and 2 years prior, respectively. Severe CS appeared on his chest and back, and both feet were sweating again. He was profoundly distressed by the psychological and social impact of CS, and his quality of life had gradually worsened. Anticholinergic drugs did not relieve his heavy sweating. Thermoablation of sweat glands using MiraDry® (Miramar Labs, Sunnyvale, CA) on axillae was performed. Botulinum toxin injections were administered two times on both feet. The patient tried a restoration operation because of CS but failed. Patient underwent CLSB for PH with fair results of dryness of both feet during 6 months of follow-up period (Figure 3). Post-procedure side effects were not observed and the patient described an 80% reduction of sweating of both feet with high satisfaction. Additional rebound or secondary CS and sexual dysfunction were not noticed.

Discussion

The International Hyperhidrosis Society does not recommend any type of endoscopic sympathectomy, especially for PH, even as a last resort because of the possibility of CS in other areas, the irreversible nature of the procedure, heat intolerance, and other potentially challenging, severe, and unexpected side effects [5]. Nevertheless, ELS can be considered surgically in severe cases of uncontrolled PH when conservative medical management does not provide appropriate reduction of sweating. The only current surgical treatment modality that is available to treat PH is lumbar sympathectomy. Lumbar sympathectomy has been reported as having a less beneficial effect in Buerger disease, Raynaud disease, and reflex sympathetic dystrophy [6]. Currently, PH is the only remaining main indication for lumbar sympathectomy. Lumbar sympathectomy for PH has not been practiced until recently due to previous fears of CS and sexual dysfunction such as retrograde ejaculation, and has not actively reported with extensive investigations despite its clinical feasibility with widespread use. Moreover, it is supposed that the worse outcome of CS will occur after adding ELS to thoracic sympathectomy in the same patient. However, ELS has become more common recently after evidence has accumulated that permanent sexual function disorders are unlikely when performing ELS at L3/L4, as the male reproductive organs are innervated by the sympathetic chain at L1-L2. CS is less problematic than expected and ELS is acceptable as a permanent cure with high resolution and great satisfaction [3]. However, if the lumbar sympathetic chain/ganglion is not properly resected, anhidrosis will not be achieved due to the regeneration of the preganglionic nerve fibres or the presence of collateral nerve tracts. Anatomical variability of the sympathetic chain and removal of the incorrect sympathetic chain/ganglia produce failure of ELS, with recurrence of PH and the risk of sexual dysfunction in male patients [7]. There is currently no set protocol for this treatment modality as there is no unanimity as to the best surgical process [8].

CLSB was first described by Brunn and Mandl in 1924 in its use for the treatment of causalgia and post traumatic reflex dystrophy [4]. CLSB is easily carried out and has long been accepted as one of the most available popular procedures for pain control. The genitofemoral nerve is the most prone to the complication of neuralgia, which is transient and can be resolved with analgesics. Male patients must be informed that sexual dysfunction cannot be completely ruled out even

with careful lower lumbar sympathetic block because of variability in the numbers and distribution of ganglia of the individual lumbar sympathetic chains [7]. CLSB has been performed for more than 80 years to treat various diseases, including plantarhyperhidrosis, with excellent long-term results. CLSB for PH has a high success rate with a lower incidence of side effects, and in our experience, was successfully performed with fluoroscopy [4]. A careful approach and precise positioning of the needle tip can help prevent the uncomfortable and burdensome complications of CLSB, making CLSB safe and effective with long-term outcomes, with the benefit of constituting a minimally invasive procedure for severe plantar hyperhidrosis on an outpatient basis.

For such reasons we decided to utilize CLSB for our patients as a procedure that could be performed after failed ELS for PH. In these cases, the adopted block needs higher skills than usual given the state of suspected adhesion and traction of the scar at the target region to prevent wrong spreading of neurolytic alcohol, with the consideration of complications and anatomical variation. Adhesion and traction after ELS and anatomical variety may hinder the normal spread of alcohol along the lumbar sympathetic chain. Careful observation of dye dispersion before alcohol injection and neurologic confirmation is essential in this procedure. In our cases, there were no specific findings of dispersion after ELS, and the procedure was performed safely without difficulties. Our trials were applied to a limited number of patients with uncontrolled PH after ELS. PH was relieved after the procedure; there were no cases of neuralgia or sexual dysfunction post-CLSB, and patients expressed satisfaction with the outcome.

In conclusion, CLSB offers a safe and effective palliative and alternative procedure with minimal invasiveness to relieve excessive sweating in patients with PH for long periods after failed ELS. These cases may contribute to the literature as showing the effectiveness of CLSB as an available treatment. Further studies involving clinical trials are required to confirm the safety and efficacy of CLSB after failed ELS to supplement these results.

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