

Efficacy and Effectiveness Of Lumbar Sympathetic Block in Buerger's Disease (Peripheral Vascular Disease): An Observational Study

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Abstract

Introduction: High incidences of Buerger's disease (43-62%) in India draw our attention towards available treatment modalities in such patients. Patients with this disease are in severe pain and agony. Pain relief by any means remains first and foremost priority in such patients and if patient is able to sleep even one pain free night it is a boon for the patients. The purpose of study was to test the hypothesis that lumbar sympathetic block relieves the pain of ischemic limb in Buerger's disease.

Materials and Methods: All the patients, thirty-eight male patients of TAO not responding to conservative mode of treatment and regularly visiting our pain clinic were enrolled in our study for a period of 6 months. Diagnosis of TAO was made on clinical history, local and general examination and Colour Doppler study.

Results: Visual analog scale (VAS) and claudication distance were improved significantly after 3-4 blocks but no significant difference was observed between third and fourth block. Healing of ulcer, reduction of pedal swelling was seen after each block.

Conclusion: Despite advances in treatment modalities in such patients, lumbar sympathetic block is still very cost-effective, safe, and least-invasive technique in treating painful ischemic legs.

Keywords: Buerger's disease, block, sympathectomy.

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Introduction

The outstanding symptom that occurs when the circulation to an extremity is impaired is pain. Thromboangiitis obliterans or Buerger's disease principally affects the young male smokers and is mainly a disease of medium sized and small limb arteries.^{1,2} Smoking is very common in India and so the incidence of Buerger's disease. Although

extensive experimentation has been done in this field and today various surgical and nonsurgical management options are available for managing ischemic limb ulcers. But, the results are inconsistent, controversial, and often unsatisfactory. Moreover, these techniques are costly and success depends on operator's expertise and

comfort level. It has been a hypothesis that lumbar sympathetic block relieves pain of ischemic limb. This study was conducted to study the beneficial effects of lumbar sympathetic block on visual analog score (VAS) score and walking distance of affected patients. The only definitive treatment of TAO is abstinence from smoking which also helps in preventing disease progression[3]. Conservative management in the form of aspirin, verapamil, pentoxifylline reduce pain and increase pain free walking distance in intermittent claudication but long-term usage fails to prevent disease progression in patients who still continue to smoke. The majority of patients present with an advanced stage of ischemia hence, most of them require surgical intervention in the form of either lumbar sympathectomy, omentopexy, Illizarov techniques, revascularization or major or minor amputations and recently stem cell therapy helps in reducing the pain and promote healing of trophic changes[3]. Percutaneous lumbar chemical sympathectomy with complete cessation of smoking along with pharmacotherapy is the first step in managing rest pain of TAO. Lumbar sympathetic block is used for evaluation and management of sympathetically mediated pain in lower limbs in TAO[4,5]. In spite of availability of various surgical and nonsurgical options in relieving pain in TAO results are often inconsistent. Supportive care should be directed towards maximizing blood supply to the affected limbs.

Materials and Methods

From thirty-eight male patients of TAO not responding to conservative mode of treatment and regularly visiting our pain clinic were enrolled in our study for a period of 6 months. Diagnosis of TAO was made on clinical history, local and general examination and Colour Doppler study. The age varied from 25-50 years. Patients with ASA physical status I or II with history of smoking, rest pain, claudication pain, leg

ulcer or gangrene and not responding to conservative mode of treatment were included in our study. Colour Doppler study revealed absent dorsalis pedis artery pulsations, partial thrombosis of major vessels: popliteal artery, anterior and posterior tibial artery of the affected lower limb. Patients giving history of systemic disease like diabetes mellitus, coagulopathies, heart disease, grossly infected ulcer or gangrene, allergy to used drugs, difficulty in lying down in prone position were excluded from our study profile. Basic investigations like complete hemogram, blood sugar level, coagulation ECG and colour Doppler was done.

Statistical calculations

Statistical Package for Social Sciences (SPSS) 11.5 version software was used for data calculations and data was analyzed by paired *t*-test. *P*-value considered significant when it was less than 0.05.

Results

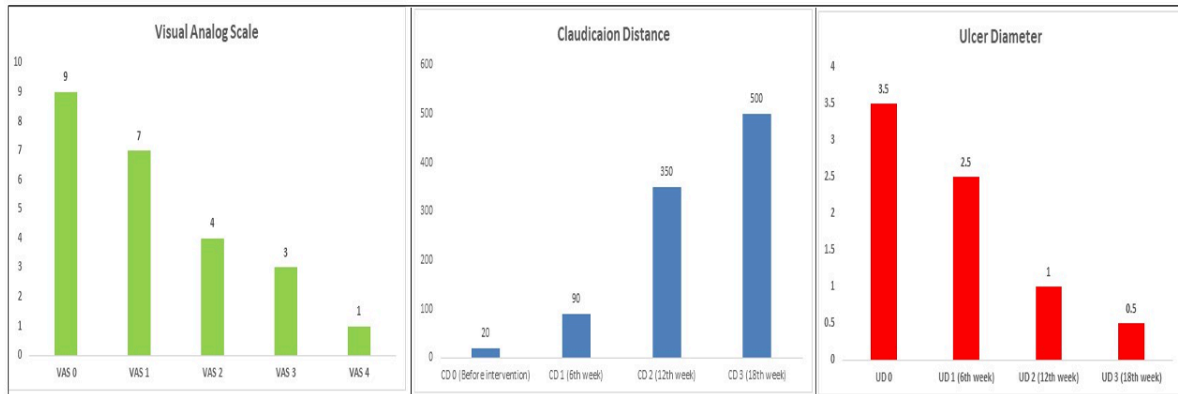
In our study, 38 patients were included over a period of 6 months. Mean age of the patients was in a range of 36.58±7.63 (table 1). Amongst all the patients 94.6% were heavy smokers, the great toe was involved in all cases with other toes and foot in some patients. The mean VAS Score before the intervention was 8-9/10 in all cases. The mean claudication distance was size of ulcer if any was 25 ± 15 metres. The effect of each successive LSB was compared with the previous VAS score and it was observed that after the first LSB, the VAS score improved significantly and came down to 6- 6.5/10. with each successive block VAS score to 3 and 1-1.5/10 subsequently. (Graph 1) The claudication distance CD also improved significantly after each block and was statistically significant. (*p* less than 0.05) (Graph 2) Ulcer diameter also showed significant decrease (graph 3) in size after each block. the ulcer diameter which was 3-4 cm before LSB improved significantly after each block.

Table 1:

	Age (Year)	Weight (Kg)	VAS (Score)	CM (0 cm)	UD
Mean	36.5g	58.50	9.38	25.15	3.54
SD	6.204	7.22	0.650	11.50	0.79

VAS- Visual Analog scale; CD- Claudication Distance; UD- Ulcer Diameter

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Graph 1: Visual Analog scale.

Graph 2: Claudication distance

Graph 3: Ulcer diameter



Fig:1 Showing healing of ischemic ulcer on great toe and color change after successive block

Discussion

Thromboangitis obliterans is a vaso-occlusive disease of unknown etiology affecting mainly the medium sized vessels of the extremities and mainly the gender involved is male who are chronic smokers [6]. Phenol and alcohol are used for chemical neurolysis in lumbar sympathectomy since long back[6] and can benefit patients with critical limb ischemia

but proper selection of patients is very important as stated by Nesagikar *et al.*[6] Deep infection and gangrene are a sign of bad prognosis and predicts failure of the block. If there is no evidence of somatic neuropathy then the response of chemical neurolysis is good. In our study we included patients with gangrene and they showed moderate reduction in pain and effective healing of the gangrene. Sympathetic nervous system is implicated in vascular,

neuropathic and visceral pain.^{7,8} Lumbar sympathetic blocks in series works for rest pain and healing of ischemic ulcers because of marked reduction in peripheral resistance leading to opening of AV anastomoses thereby increasing blood flow to the skin, alleviation of rest pain also occurs because of the neurolysis of the afferent pain fibres travelling in the sympathetic tract. It also improves the tissue oxygenation by reducing the sympathetic tone. Hence surgical sympathectomy has been largely replaced by chemical lumbar sympathectomy^[9], the advantage being its minimally invasive nature and day care procedure.^[10,11] Steroids utilized in neural blockade cause decreased central sensitization of the dorsal horn nociceptive neurons, inhibit synthesis of pro inflammatory substance and neuronal peptides and suppress the ongoing neuronal discharge.^[12,13] Although there are inconsistent reports regarding the effectiveness of chemical lumbar sympathectomy with long acting steroids, they are commonly used modalities in treating ischemic pain and ulcers with fewer side effects^[14] Our study had a positive effect of chemical lumbar sympathectomy with long acting steroids and local anaesthetic agent in reducing pain and in improving the circulation to the affected limb. Our results were supported by Bhattarai *et al.* in decreasing the rest pain and healing of the ischemic lower limb. Limitation of our study were that it is monocentric and the sample size is very small. Also, long term follow-up is required to come to final conclusion of effectiveness of LSB in TAO cases.

Conclusion

Lumbar sympathetic block is cost-effective, noninvasive, and less risky technique in relief of pain in Buerger's disease. Pain is relieved from the first block itself which is evident by improvement of VAS score. Eventually there is improvement in walking distance also and patient is able to do his routine work.

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