

# A study of series of lumbar sympathetic block for pain relief in patients of Thromboangitis

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## Abstract

**Background:** Thromboangitis Obliterans is a most commonly occurring peripheral vascular disease (PVD) characterized by recurring progressive non atherosclerotic inflammation and thrombosis of small and medium sized vessels, mainly arteries and veins of the extremities. Thromboangitis Obliterans (TAO) results in severe rest pain, ulcer, claudication pain and disability. It can also cause gangrene and amputation of limbs with progression of the disease. Percutaneous lumbar chemical sympathectomy is commonly used intervention to relieve pain in patients suffering from TAO. **Aims and Objective:** The purpose of our study was to evaluate the effectiveness and clinical outcome of percutaneous sympathectomy in relieving pain, ulcer healing, reduction in swelling and improvement of claudication distance in patients suffering from TAO. **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:** A series of lumbar sympathetic blocks with bupivacaine and steroid is an effective and safe technique in relieving rest pain, improving claudication distance, ulcer healing in patients suffering from TAO when conservative management becomes ineffective. The number of blocks required in our study varied from three to five.

**Keywords:** Thromboangitis Obliterans (TAO), Buerger's disease, Lumbar sympathetic block (LSB), Bupivacaine, Triamcinolone, Claudication distance (CD)

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## INTRODUCTION

Thromboangitis Obliterans (TAO) or Buerger's disease is characterized by peripheral ischemia of an inflammatory nature with a self-limiting course. Shionoya's criteria<sup>1</sup> for the diagnosis of TAO are: history of smoking, onset before age 50, infrapopliteal arterial occlusion, either upper limb involvement or phlebitis migrans, absence of

atherosclerotic risk factors other than smoking. Confident clinical diagnosis of TAO may be made only when all five requirements have been met. TAO was first reported in 1908 and is characterized by a recurring progressive inflammation and thrombosis of small and medium sized arteries and veins of hands and feet<sup>1</sup> and impending gangrene. The etiology still remains unclear but it is strongly associated with chronic tobacco smoking. It is still uncertain whether thrombosis or vascular inflammation is the first event<sup>2</sup>. The involvement of the distal vessels and nerves within the neurovascular bundle occurs mostly in lower limbs and very rarely in upper limbs<sup>3,4</sup>. TAO is the most common cause of peripheral vascular disease (PVD) in India. Contrary to that in western countries where it accounts for 0.5% to 12% of all peripheral vascular diseases, the incidence is 45% to 63% in India.<sup>2</sup> It is more common in people of low socioeconomic class who smoke bidis. The predisposing factors include male gender, cigarette smoking, infectious agents, environmental

factors such as anxiety, stress and low socioeconomic status<sup>4</sup>. The only definitive treatment of TAO is abstinence from smoking which also helps in preventing disease progression<sup>5</sup>. 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<sup>5</sup>. 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<sup>6,7</sup>. 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.

**MATERIAL AND METHODS**

After approval from the ethics committee and obtaining written informed consent from 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. 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 to assess the condition of vessels before subjecting patients for lumbar sympathetic block Patients

fasting status was ensured before taking them to the operation theatre. On arrival into OT, routine monitoring of non invasive blood pressure, heart rate, pulse oximetry was commenced and Intravenous assess achieved with lactated Ringer solution started as loading fluid. Patient were positioned prone with a pillow underneath abdomen to correct the lumbar lordosis. Under all aseptic precautions and under local infiltration with 2% lignocaine, the entry point was confirmed under fluoroscope and a 22 gauze 15 mm long spinal needle was introduced along the lateral border of L3 vertebral body in oblique view under C-arm guidance. Depth of the needle was confirmed in lateral view with a target to reach the anterolateral aspect of L3 vertebra. Iohexol Contrast was used to confirm the proper positioning of the needle. After confirming the proper positioning of needle tip 10 ml of 0.25% bupivacaine with 40 mg triamcinolone was given on the affected side. In case of bilateral involvement same procedure and drugs were repeated on other side also. Vital parameters were monitored throughout the procedure and patients were shifted to recovery and observed for 4 hours and then discharged accordingly. The block was repeated weekly in all patients and VAS score, claudication distance and condition of ulcer, pedal edema was assessed by a third person after every week. Patients were given analgesics, antibiotics and were asked to continue the vasodialators and antiplatelet drugs after the intervention.

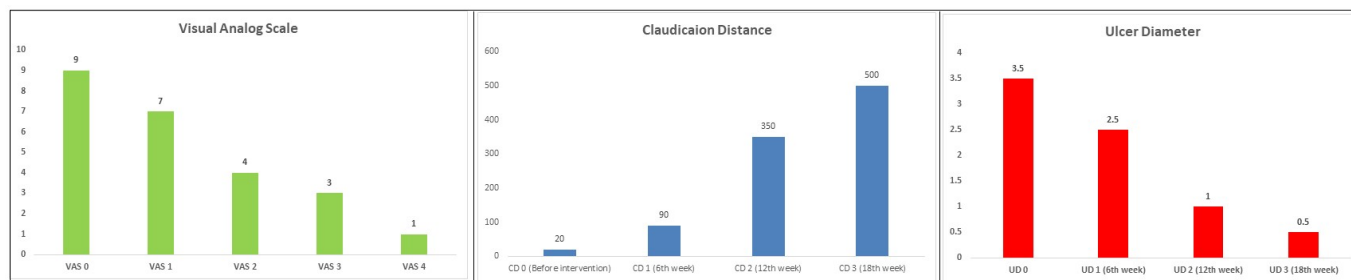
**RESULTS**

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)	CD (0cm)	UD (0cm)
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- Claudicaion Distance; UD- Ulcer Diameter



Graph 1: Visual Analog scale

Graph 2: Claudicaion distance

Graph 3: Ulcer diameter

## 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.<sup>7</sup> Phenol and alcohol are used for chemical neurolysis in lumbar sympathectomy since long back<sup>7</sup> and can benefit patients with critical limb ischemia but proper selection of patients is very important as stated by Nesagikar *et al.*<sup>7</sup> 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.<sup>8,9</sup> 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<sup>10</sup>, the advantage being its minimally invasive nature and day care procedure.<sup>11,12</sup> 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.<sup>13,14</sup> 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<sup>15</sup> 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.<sup>16</sup>

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

In our study we concluded that three to four lumbar chemical sympathetic blocks using bupivacaine and steroid under fluoroscopic guidance is an effective and safe technique in relieving rest pain, improving claudication distance, reduction of swelling and ulcer healing in patients with Buerger's disease along with absolute abstinence from smoking when the medical management become ineffective.

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