

Minimally Invasive Procedure Vs Standard Open Approach For Lumbar Sympathectomy

Dr. Harshavardhan Haldipur^{1*}, Dr. R. G. Naniwadekar², Dr H B Janugade³

¹3rd year Resident, Department of General Surgery, KIMS, Karad, Maharashtra, India Email: haldipurharsha@gmail.com
^{2,3}Professor, Department of General Surgery, KIMS, Karad, Maharashtra, India

*Corresponding Author: Dr. Harshavardhan Haldipur

¹3rd year Resident, Department of General Surgery, KIMS, Karad, Maharashtra, India Email: haldipurharsha@gmail.com
 DOI: 10.47750/pnr.2022.13.505.59

Abstract

Aim: Peripheral arterial disease (PAD) is chronic arterial occlusive disease of the lower extremities caused by atherosclerosis. The present study was conducted for comparing the efficacy of minimally invasive procedure vs standard open approach for lumbar sympathectomy.

Materials & methods: 100 patients were enrolled in the present study (who were scheduled to undergo lumbar sympathectomy) and were divided broadly and randomly into two study groups: Group 1: Patients undergoing lumbar sympathectomy by minimal invasive procedure, and Group 2: Patients undergoing lumbar sympathectomy through standard open approach. Only those patients were included who had Ischemic rest pain that requires continuous analgesia for more than 3 weeks and Ischemic foot ulcers that failed to heal for more than 6 weeks. All the patients underwent surgical procedures according to their respective study groups. All the results were recorded in Microsoft excel sheet and were analysed using SPSS software.

Results: Mean duration of analgesic consumption for controlling pain postoperatively was 3.9 weeks in group 1 while it was 3.7 weeks in group 2. Mean operative time among the patients of group 1 and group 2 was 51 minutes and 83 minutes respectively (p-value < 0.05). Incidence of complications was significantly higher among the patients of group 2 in comparison to the patients of group 1. Mean recovery time among the patients of group 1 and group 2 was 5.2 days and 7.3 days respectively (p-value < 0.05).

Conclusion: Among patients undergoing lumbar sympathectomy, minimally invasive procedure is better in comparison to standard open procedure.

Key words: Lumbar Sympathectomy, Minimally invasive

INTRODUCTION

Peripheral arterial disease (PAD) is chronic arterial occlusive disease of the lower extremities caused by atherosclerosis. The PAD may cause intermittent claudication which is pain or weakness with walking that is relieved with rest. The muscle pain or weakness after exercise occurs distal to the arterial obstruction.^{1,2} Lumbar sympathetic blocks to result in a sympathectomy have been described as an effective pain management treatment strategy for several causes of chronic pain since the early 1900s. The first reports of a lumbar sympathetic block technique, as well as sympathectomy, were initially documented in the 1920s. The conditions for which this treatment has been effectively implemented include lower extremity complex regional pain syndrome as well as various painful conditions resulting in circulatory insufficiency in the lower extremity such as Buerger's disease, embolic occlusions, frostbite, vasospastic disease, and peripheral arterial disease.³⁻⁵

Lumbar sympathectomy cuts off sympathetic nerve connections at the lumbar vertebral (lower backbone) level. Lumbar sympathectomy techniques can be used to treat patients with PAD, as destruction of the sympathetic chain improves skin blood flow and modifies pain perception.⁶ Hence; the present study was conducted for comparing the efficacy of minimally invasive procedure vs standard open approach for lumbar sympathectomy.

MATERIALS & METHODS

In present study we have done comparison between minimally invasive procedure with the standard open approach for lumbar sympathectomy and their outcome. 100 patients were enrolled in the present study (who were scheduled to undergo lumbar sympathectomy) and were divided broadly and randomly into two study groups: Group 1: Patients undergoing lumbar sympathectomy by minimal invasive procedure, and Group 2: Patients undergoing lumbar sympathectomy through standard open approach. Only those patients were included who had Ischemic rest pain that requires continuous analgesia for more than 3 weeks and Ischemic foot ulcers that failed to heal for more than 6

weeks. All the patients underwent surgical procedures according to their respective study groups. All the results were recorded in Microsoft excel sheet and were analysed using SPSS software.

RESULTS

100 patients were enrolled in the present study (who were scheduled to undergo lumbar sympathectomy) and were divided broadly and randomly into two study groups: Group 1: Patients undergoing lumbar sympathectomy by minimal invasive procedure, and Group 2: Patients undergoing lumbar sympathectomy through standard open approach. Mean age of the patients of group 1 and group 2 was 42.8 years and 44.9 years respectively. Mean duration of analgesic consumption for controlling pain postoperatively was 3.9 weeks in group 1 while it was 3.7 weeks in group 2. Mean operative time among the patients of group 1 and group 2 was 51 minutes and 83 minutes respectively (p- value < 0.05). Incidence of complications was significantly higher among the patients of group 2 in comparison to the patients of group 1. Mean recovery time among the patients of group 1 and group 2 was 5.2 days and 7.3 days respectively (p- value < 0.05).

Table 1: Age-wise distribution

Age group (years)	Group 1		Group 2	
	Number	Percentage	Number	Percentage
Less than 30	10	20	12	24
30 to 50	29	58	28	56
More than 50	11	22	10	20
Total	50	100	50	100
Mean	42.8		44.9	

Table 2: Mean duration of analgesics consumption

Duration of analgesic consumption (weeks)	Group 1	Group 2
Mean	3.9	3.7
SD	1.8	1.2
p- value	0.12	

Table 3: Mean operative time (minutes)

Mean operative time	Group 1	Group 2
Mean	51	83
SD	12.5	15.7
p- value	0.00 (Significant)	

DISCUSSION

Peripheral arterial disease of the lower limbs progresses from IC to rest pain, ischaemic ulcers and finally gangrene. If definitive vascular reconstruction is not possible, amputation may be required. Medical therapy, chemical sympathectomy and lumbar sympathectomy have been used to treat patients with severe, non-reconstructable disease, with varied results. A Cochrane review comparing lumbar sympathectomy with prostanoids for CLI due to non-reconstructable PAD is currently in progress. Previous authors have reported that sympathectomy may be beneficial when compared with no intervention in relieving rest pain in 60% to 75% of patients at short-term follow-up, and long-term effectiveness has been noted in up to 50% of patients.⁶⁻⁹ Hence; the present study was conducted for comparing the efficacy of minimally invasive procedure vs standard open approach for lumbar sympathectomy.

Mean duration of analgesic consumption for controlling pain postoperatively was 3.9 weeks in group 1 while it was 3.7 weeks in group 2. Mean operative time among the patients of group 1 and group 2 was 51 minutes and 83 minutes respectively (p- value < 0.05). Our results were in concordance with the results obtained by Watarida S et al who also reported similar findings. In their study, symphaectomy was performed using a retroperitoneal approach on six patients and an anterior transperitoneal approach on one patient. After laparoscopic lumbar sympathectomy, skin thermometry was carried out on all patients. The postoperative skin temperature of the affected leg rose to 36.6 +/- 0.5 degrees C, as compared to 33.8 +/- 0.8 degrees C preoperatively. After laparoscopic lumbar sympathectomy, none of the patients complained of neuralgia. All patients achieved sustained symptomatic relief, and no major postoperative complications were noted. Lumbar sympathectomy can be performed laparoscopically.¹⁰

In the present study, incidence of complications was significantly higher among the patients of group 2 in comparison to the patients of group 1. Mean recovery time among the patients of group 1 and group 2 was 5.2 days and 7.3 days respectively (p- value < 0.05). J Bognár, in their study assessed forty-four lumbar sympathectomies on 42 patients by ROMICRO-set at the department. This method--made by a specially developed lighting retractor system--ensures the same exposure as the traditional approach, but the visibility of the operative field is much better. Authors have got good experiences: there were no complications, postoperative pain is minimal, the time of the hospitalization is shortened. A special advantage of this new approach is that it can be even made on patients-belonging to ASA IV., and they can be

operated on in epidural anesthesia. The authors recommended that this method only for those surgeons who are experienced in the technique of traditional lumbar sympathectomies.¹¹ Interest in lumbar sympathectomy performed via minimally invasive access has been increasing among patients who are affected by PHH, as well as among physicians involved in treating this disease. There are some slight technical differences described related to access to the retroperitoneal space, or use of clips instead of resection of the lumbar chain. Surgery with mini-instruments seems to increase the safety of ELS, at least by providing better visualization of the operative field. As previously reported for other minimally invasive surgical techniques, use of 3mm instruments adds some advantages. They have been used in other types of operations, such as bariatric, gallbladder, and hernia surgery.¹²⁻¹⁵ Hence; minimal invasive approach was more affective in terms of better operative time and lowered incidence of complications.

CONCLUSION

Among patients undergoing lumbar sympathectomy, Minimally invasive procedure is better in comparison to standard procedure.

REFERENCES

1. Dormandy JA, Rutherford RB, the TASC Working Group TransAtlantic Inter-Society Consensus (TASC). Management of peripheral arterial disease (PAD) *J Vasc Surg.* 2000;31:1–296.
2. McDermott MM, Greenland P, Liu K, et al. Leg symptoms in peripheral arterial disease. Associated clinical characteristics and functional impairment. *JAMA.* 2001;286:1599–606.
3. McDermott MM, Greenland P, Liu K, et al. Sex differences in peripheral arterial disease: leg symptoms and physical functioning. *J Am Geriatr Soc.* 2003;51:222–8.
4. Chander J, Singh L, Lal P, Jain A, Lal P, Ramteke VK. Retroperitoneoscopic lumbar sympathectomy for buerger's disease: a novel technique. *JLS.* 2004 Jul-Sep;8(3):291-6
5. Periard D, Cavassini M, Taffé P, Chevalley M, Senn L, Chapuis-Taillard C, de Vallière S, Hayoz D, Tarr PE., Swiss HIV Cohort Study. High prevalence of peripheral arterial disease in HIV-infected persons. *Clin Infect Dis.* 2008 Mar 01;46(5):761-7.
6. Khandanpour N, Loke YK, Meyer FJ, Jennings B, Armon MP. Homocysteine and peripheral arterial disease: systematic review and meta-analysis. *Eur J VascEndovasc Surg.* 2009 Sep;38(3):316-22.
7. Krishna SM, Moxon JV, Golledge J. A review of the pathophysiology and potential biomarkers for peripheral artery disease. *Int J Mol Sci.* 2015 May 18;16(5):11294-322.
8. Subherwal S, Patel MR, Kober L, Peterson ED, Bhatt DL, Gislason GH, Olsen AM, Jones WS, Torp-Pedersen C, Fosbol EL. Peripheral artery disease is a coronary heart disease risk equivalent among both men and women: results from a nationwide study. *Eur J PrevCardiol.* 2015 Mar;22(3):317-25.
9. Wakabayashi I, Sotoda Y. [Alcohol drinking and peripheral arterial disease of lower extremity]. *Nihon ArukoruYakubutsuIgakkaiZasshi.* 2014 Feb;49(1):13-27.
10. Watarida S, Shiraishi S, Fujimura M, Hirano M, Nishi T, Imura M, Yamamoto I. Laparoscopic lumbar sympathectomy for lower-limb disease. *SurgEndosc.* 2002 Mar;16(3):500-3
11. J Bognár, S Farkas, I Inceffly. Minimal invasive lumbar sympathectomy. *Orv Hetil.* 1999 Dec 26;140(52):2913-5.
12. Loureiro MP, Campos JRM, Kauffman P, Jatene FB, Weigmann S, Fontana A. Endoscopic lumbar sympathectomy for women: effect on compensatory sweat. *Clinics.* 2008;63(2):189–196.
13. Rieger R, Loureiro MP, Pedevilla S, Oliveira RA. Endoscopic lumbar sympathectomy following thoracic sympathectomy in patients with palmoplantar hyperhidrosis. *World J Surg.* 2011;35(1):49–53.
14. Carvalho GL, Loureiro MP, Bonin EA, et al. Minilaparoscopic technique for inguinal hernia repair combining transabdominal pre peritoneal and totally extraperitoneal approaches. *JLS.* 2012;16(4):569–575.
15. Loureiro M, Sultan A, Alhaddad M, et al. Needlescopic sleeve gastrectomy: pushing the boundaries of the standard technique. *SurgEndosc.* 2017;31(10):4256–4257.