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Research Article

SINGLE STAGE LUMBAR SYMPATHECTOMY WITH OMENTOPEXY THROUGH MIDLINE APPROACH: SURGICAL TREATMENT OF CHOICE FOR BUERGER'S DISEASE

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ABSTRACT

Buerger's Disease is a limb-threatening condition occurring in the young and productive age group and its management has always been a challenging problem. The therapeutic approach has been mainly consisting of medical-pharmacological or surgical treatment or both combined. Various treatment options have been used for the treatment of this condition, but none has been found to be effective except for the cessation of smoking. Fifty patients were included in the study and underwent either LS alone (n=25) and omentopexy with LS (n=25). The improvement in the sign and symptoms of the disease were observed pre and postoperatively. It was found out that Omentopexy with LS is significantly superior to LS alone in relieving the signs and symptoms of Buerger's disease. We conclude that omentopexy with LS is significantly superior and can be used as the surgical treatment of choice for Buerger's disease.
Keywords: Omentopexy, Lumbar sympathectomy, Buerger's disease, Thromboangiitis obliterans.
Abbreviations: TAO, LS, HGF, VEGF.

INTRODUCTION:

Buerger's Disease is a limb-threatening condition occurring in the young and productive age group and its management has always been a challenging problem. The therapeutic approach has been mainly consisting of medical-pharmacological or surgical treatment or both combined.[1] In 1908, Buerger characterized the disease the disease and noted that the condition occurred in young patients and presented a consistent pathologic picture of segmental thrombotic occlusion of distal vessels. It occurs mainly in medium and small vessels. It affects young male smokers and often leads to severe disability.[2]

Medical treatment modalities used for the treatment of thromboangitis obliterans comprises of aspirin[3], ilioprost[3], Bosentan[4], intra-arterial thrombolytic therapy (streptokinase) [5], pentoxyfylline, cilostazol and verapamil[6]. Novel therapies like intramuscular injection of phVEGF[7] and spinal cord stimulators, [5][8] immunoadsorption, [9] intramuscular injection of naked plasmid DNA encoding hepatocyte growth factor (HGF),[10] autologous bone marrow mononuclear cell transplantation[11] have also been tried for the treatment of thromboangitis obliterans.

Surgical treatment option have consisted of sympathectomy.[12-14] arterial surgery,[15][16] endovascular surgery,[17][18] adrenalectomy,[13] Ilizarov technique[19] and amputation as a last report. But the only proven strategy to prevent progression of the disease and avoid amputation is the complete discontinuation of cigarette smoking or other use of tobacco in any form. [20] Traditionally patient who have ischemic signs and symptoms have been offered sympathectomy despite the fact that sympathectomy does not exempt the patient from a subsequent relapse or amputation, as vasomotor tone is usually normalized in 2wks to 6months after operation. The property of omental pedicle to induce neo-angiogenesis and thus improve circulation of surrounding tissues has been well established. A lipid angiogenic factor from omentum has been proposed to be responsible for this property of omentum. [21-23] In this study, we are going to compare the results of lumbar sympathectomy alone v/s the results of omentopexy with LS in patients of TAO.

MATERIAL AND METHODS

The ethical approval was obtained from the institutional ethical committee. The study was conducted in the Department of Surgery in our institution for a period of one year from November 2012 to October 2013. The patients admitted with a diagnosis of TAO were included in the study. The patients already having gangrene and any abdominal pathology, history of abdominal surgery were excluded from the study. The patients were alternatively randomized to undergo either LS alone (n=25) or omentopexy with LS (n=25). Lumbar sympathectomy was performed by a retroperitoneal approach in patients undergoing LS alone while in the other group, LS was performed via a transperitoneal approach.

Technique of Omentopexy: The abdomen was opened by a midline incision. The greater omentum was freed from the transverse colon along the vascular plane and then from the greater curvature of the stomach taking care to preserve the gastroepiploic arcades and the blood vessel between the arcades. In doing so the pedicle is based on either the right or the left gastroepiploic artery based on the dominance. Then the detached omentum was taken out and omentum was lengthened equal to the length of the lower limb. The omentum was fixed to the parietal wall using non absorbable sutures to prevent the rotation of gut around it. An incision was made 2 cm above the inguinal ligament and omentum was then taken out from this incision. Abdomen was closed. A series of transverse incisions of about one inch was made on medial aspect of the thigh, leg and ankle at the distances of about 10 centimetres from one another. Using long artery forceps a tunnel was made in the subfascial place, through the incisions and the lengthened

omentum was spread in the tunnel from the uppermost incision down to the lowermost. The wounds were closed with fine sutures in the usual manner.

The patients were examined for the signs and symptoms preoperatively and color doppler examination was done. After the surgery, the improvement in these sign and symptoms in the patients undergoing both the surgery were compared at a follow-up of 7 days, 15 days, 1 month and 3 months postoperatively.

RESULTS

Total 50 patients were included in the study. Both the groups included 25 patients. The most common age group of the patients was 41-50 yrs with mean age being 40.46 years. All the patients included in the study were male. Intermittent claudication was the most common symptom observed in 98% of the patients with other symptoms present in varying proportions.(Table 1) It was found out that LS was effective in relieving the sign and symptoms of Buerger's disease in the initial postoperative period with the effects waning with time while the effects of omentopexy with LS are longlived. (Table 2 and 3)

DSA was performed in 22 out of 25 patients who were selected for omentopexy. Poor distal runoff with collateral formation was present in anterior and posterior tibial arteries in 14 out of 22 patients and in remaining patients, it was seen in only dorsalis pedis.

Postoperatively, DSA was performed in 15 out of the 22 patients in which it was performed preoperatively(due to technical limitations) and no change in major vessels was observed but there was extensive collateral flow.

Table 1 : Observation of sign and symptoms in Buerger's disease

Sign & Symptoms	No. of patients	Percentage (%)
Rest pain	42	84
Intermittent Claudication	49	98
Discoloration of skin	18	36
Coldness of limb	47	94
Ulceration	38	76
Muscle wasting	36	72
Gangrene	16	32

Table 2: Comparison of the effectiveness of the lumbar sympathectomy & omentopexy with LS at 7 days

Sign and symptoms	Patients got relief by LS (%)	Patients got relief by Omentopexy (%)	P value
Rest pain	80	86.4	0.89
Intermittent claudication	16.67	12	0.94
Discolouration of skin	0	00	0.81
Coldness of limb	87.5	87	0.70
Ulceration	0	4.8	0.92
Muscle wasting	0	00	0.87
Gangrene	0	00	0.80

Table 3 : Comparison of the effectiveness of the lumbar sympathectomy & omentopexy with LS at 3 month

Sign and symptoms	Patients got relief by LS (%)	Patients got relief by Omentopexy (%)	P value
Rest pain	25	81.8	0.0007
Intermittent claudication	16	92	<0.0001
Discolouration of skin	33.3	75	0.669
Coldness of limb	37.5	91.3	0.0004
Ulceration	11.8	90.5	<0.0001
Muscle wasting	5.9	78.9	<0.0001
Gangrene	00	66.7	0.027

Table 4: Symptom relief after omentopexy with LS(in % of patients)

S. No	Study	Intermittent claudication	Rest pain	Coldness	Ulceration	Discoloration
1	Present study	92	81.8	91.3	90.5	75
2	Talwar et al[24]	82	91	87	78	82
3	Hoshino et al[25]	63	95	58	80	68
4	Bhargava et al[26]	90.4	90.9	---	78.4	---
5	Ranwaka et al[27]	86.67	66.67	---	80	---
6	Subodh et al[28]	60	88	66	50	75

Table 5: Comparison of the effectiveness of the lumbar sympathectomy & omentopexy with LS at 15 days

Sign and symptoms	Patients got relief by LS (%)	Patients got relief by Omentopexy (%)	P value
Rest pain	80	72.7	0.85
Intermittent claudication	41.67	24	0.31
Discolouration of skin	10	25	0.83
Coldness of limb	66.67	69.6	0.92
Ulceration	5.89	23.8	0.28
Muscle wasting	00	00	0.86
Gangrene	00	00	0.80

Table 6: Comparison of the effectiveness of the lumbar sympathectomy & omentopexy with LS at one month

Sign and symptoms	Patients got relief by LS (%)	Patients got relief by Omentopexy (%)	P value
Rest pain	60	54.5	0.96
Intermittent claudication	25	44.4	0.27
Discolouration of skin	33.3	37.5	0.87
Coldness of limb	50	60.9	0.40
Ulceration	11.8	38.1	0.14
Muscle wasting	5.9	21.1	0.40
Gangrene	00	22.2	0.57

DISCUSSION

Total of 50 patients underwent LS (n=25) and omentopexy with LS (n=25). It was found out that at 7 days postoperatively, LS was effective in relieving the coldness of limbs in 87.5% and rest pain in 80% of patients while it was not effective in relieving intermittent claudication (only 16.67% of the patients) (Table 2) while at 3 month of follow-up, it was ineffective in relieving the sign and symptoms of TAO (Table 3).

At 7 days, omentopexy with LS had nearly similar effect in relieving the signs and symptoms of TAO. It was effective in relieving the coldness of limbs in 87% of patients and rest pain in 86.4 % while intermittent claudication was relieved in only 12% of patients. (Table 2) But at 3 months of follow-up, it was found that omentopexy with LS has a far better outcome than LS alone with intermittent claudication relieved in 92% of patients and other symptoms relieved to a variable extent. (Table 3)

This is in concordance with other studies in which omentopexy has been found to be effective in relieving the various symptoms of TAO to a variable extent.(Table 4)

On comparison of the results of the LS and omentopexy with LS, it has been observed that in the early 7 days, there is no significant difference between the two procedures but as the follow up period has increased 15 days and 1 month, there is no significant difference between the two procedures. But at 3 month followup, the results of omentopexy with LS are significantly superior to LS alone except for improvement in discoloration of skin. This can be explained by the fact that the effects of LS are instant and short lived (upto around 4-6 wks due to the transient loss of the sympathetic tone on the blood vessels) while the improvement in the symptoms after

omentopexy with LS are gradual and longstanding. This may be due to the neo angiogenesis induced by the presence of pedicled omentum in the lower limb. Moreover the lumbar sympathectomy became ineffective by the course of time & due to the progression & advancement of the disease while the results of omentopexy with LS could not be hampered by the progression of the disease in the pre-existing vasculature. The reason is that the omentum causes new capillary growths in both superficial and deep ischemic tissues which are free from the disease present in the pre-existing vessels which caused the ischemia. While the effects of the lumbar-sympathectomy depend on the vasodilatation of the pre-existing vessels. And if they are diseased or have irrecoverable obstruction and unable to be dilated due to the marked degeneration changes in their wall, the lumbar sympathectomy does not benefit. Furthermore in the present study we found that the lumbar sympathectomy is effective only to the superficial (skin) ischemic lesions while those related with deeper tissues it is not, while by the omentopexy with LS ischemia of the superficial & the deep tissues can be relieved. This is due to the fact that the sympathectomy increases vascular perfusion in the skin by vasodilatation of the cutaneous vessels while the vessels of the deeper tissues remain ineffective. So omentopexy with LS has advantage over the lumbar sympathectomy due to its effectivity in both the superficial and the deeper lesions of the peripheral vascular disease and genesis of new vessels free from the prexisting disease.

Also the combination of LS and omentopexy may serve a dual function with LS being effective in relieving the symptoms in the early postoperative period where there is no effect of omentopexy and as the follow-up period increases, when LS starts to lose its efficacy, the effects of omentopexy start to appear.

Similar studies have not been found in the literature review regarding comparison of LS versus omentopexy with LS.

It is thus clear that the pedicled omentopexy with LS can serve as a simple, safe and less expensive operation and may become the surgical treatment of choice for the Buerger's diseases with distressing symptoms & the end stage ischemia of the lower limbs.

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