Lymphatic microsurgery to treat lymphedema: techniques and indications for better results

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▲ Lymphedema refractory to non-operative methods may be managed by surgical treatment. Lymphatic-venous multiple anastomosis consists in anastomosing lymphatic vessels to a collateral branch of the main vein (1-3). The operation consists in performing microsurgical multiple lymphatic-venous anastomosis (LVA).
Healthy appearing lymphatics found at the site of surgical operation are directly introduced together into the vein. With the use of Patent Blue dye, properly functioning lymphatics appear blue, and the passage of blue lymph into the vein branch verifies the patency of the lymphatic-venous. For patients with lower limb lymphedema, anastomoses are performed at the sub-inguinal region. Lymph nodes are subjected to histopathologic examination. The usual finding in primary lower limb lymphedemas is a varying grade of nodal fibrosclerosis and thickening of the nodal capsule but with normal afferent lymphatic vessels. For upper limb lymphedema, lymphatic-venous anastomoses are performed at the medium third of the volar surface of the arm, using both superficial and deep lymphatic collectors, evidenced by the blue dye.
Primary lymphedemas largely include lymph nodal dysplasias (4) consisting of hypoplastic lymph nodes with sinus histiocytosis and a thick and fibrous capsule with microlymphangioadenomyomatosis. In these cases, lymph flow obstruction was apparent as seen by alterations of the afferent lymphatics which appeared dilated and swollen with thickened walls and where smooth muscle cells are reduced in number and appear fragmented by associated fibrous elements. Secondary lymphedemas are largely due to lymphadenectomy and radiotherapy performed for oncological reasons.
Diagnostic investigations consisted in venous duplex scan and lymphoscintigraphy. Results were assessed clinically by volumetry performed pre- and post-operatively. The outcome obtained in treating lymphedemas at different stages is analyzed in terms of volume reduction, stability of results with time, reduction of dermatolymphangioadenitis (DLA) attacks, necessity of wearing elastic supports and use conservative measures post-operatively. Volume changes showed a significant improvement, till over 80% volume reduction comparing pre-operative conditions. DLA attacks reduced of about 90%. Lymphoscintigraphy helped in verifying the patency of microanastomoses long term after operation.
Lymphatic microsurgery represents a means to bypass the obstacle to lymph flow. Combined physical therapy nonetheless represents the initial treatment of patients affected by peripheral lymphedema and it is best performed in specialized centers. The surgical timing follows completion of conservative treatment when further clinical improvement can no longer be achieved and/or recurrent lymphangitic attacks are not further reduced

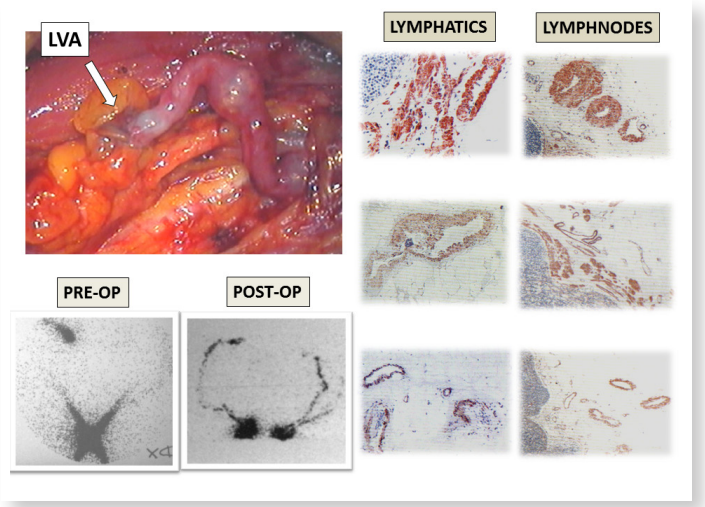

Fig.1: Derivative lymphatic-venous multiple anastomoses (LVA), Staging of lymphatic vessels and lymph nodes in lymphedema patients, Lymphoscintigraphic long term demonstration of LVA patency.

(5). Microsurgical operations can then be performed and provide further improvement in the condition (6-8).

The optimal indications for lymphatic microsurgery are represented by: early stages (Ib, II, early III), and lymphoscintigraphy showing a low inguinal or axillary lymph nodal uptake and minimal or absent passage of the tracer beyond this proximal nodal area. Non-operative measures are aimed at minimizing morbidity without removing the cause of the underlying disturbance (9-15). Microsurgical derivative and reconstructive operations can restore lymphatic drainage, both in the short and long term, and the best results are obtained when these surgical procedures are combined with physical rehabilitative methods. Finally, we recently proposed the use of lymphatic-venous anastomoses for primary prevention of arm lymphedema, performing anastomoses at the same time of axillary lymphnodal dissection for breast cancer treatment (Lymphatic Microsurgical Preventive Healing Approach – LyMPHA) (16).

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