Matteo Rossi, M.D.

Research Proposal

" Breast cancer- related lymphedema: prevalence, risk factors and surgical treatment"

Scientific Rationale

Prevalence of lymphedema related to breast cancer ranges between 8% and 89%. Probably, this variability and inconsistency in the data is due to a "misunderstanding" of the pathology and to a lack of standardization of the procedures employed for clinical and instrumental evaluation of the pathology.

Currently the surgical treatment of secondary lymphedema involves the use of functional therapeutic solutions with the aim to reconstruct the lymphatic system (reconstructive techniques) or to drain the lymphatic flow to the venous system (derivative techniques) and excisional procedures (palliative techniques) employed to reduce the arm volume. However, the choice of which technique should be performed remains controversial.

Aims of the proposal research

The aims of this proposal research are:

1) To standardize the diagnostic modalities of breast cancer related upper limb lymphedema;

2) To define the prevalence and risk factors of the pathology;

4) to delineate the indications for the related surgical treatment (lymphovenular bypasses and liposuction)

5) To evaluate the effectiveness of the surgical treatment .

Methodology

Patients who underwent mastectomy or quadrantectomy/tumorectomy with axillary dissection during a period ranged between 2010 and 2012 will be enrolled in this study. All patients will be investigated with the use of a questionnaire and will be clinically evaluated with the circumferential

measurement of the upper limbs to identify signs of lymphedema. In selected case, the lymphatic system will be evaluated with lymphoscintigraphy and indocyanine green lymphography.

Selected patients will be treated with lymphatico-venular microsurgical anastomoses or liposuction in relation to the clinical and instrumental presentation of lymphedema.

Each patient will be evaluated postoperatively (at 1, 3, 6 and 12 months) using circumferential measurements. Post-treatment measurements were photographed, recorded on a database and compared to the preoperative circumference values to evaluate the effectiveness of the surgical treatment.

Expeted results

The standardization of diagnostic methods for secondary lymphedema related to breast cancer treatment will better define the extent of the disease and the classes of patients who would benefit from surgical treatment.

References

- Kissin MW, Querci della Rovere G, Easton D, Westbury G (July 1986). "Risk of lymphoedema following the treatment of breast cancer". *Br J Surg* **73** (7): 580–4.
- Segerström K, Bjerle P, Graffman S, Nyström A (1992). "Factors that influence the incidence of brachial oedema after treatment of breast cancer". *Scand J Plast Reconstr Surg Hand Surg* **26** (2): 223–7.
- Jarvis, C. (2004). *Physical Examination and Health Assessment* (5th ed.). Saunders Elsevier. pp. 530–553.
- Lawrence L Tretbar; Cheryl L. Morgan; Byung-Boong Lee; Benoit Blondeau; Simon J. Simonian (2007). *Lymphedema: Diagnosis and Treatment*. Springer.
- Szuba, Andrzej; Achalu, Radha; Rockson, Stanley G. (2002). "Decongestive lymphatic therapy for patients with breast carcinoma-associated lymphedema". *Cancer* **95** (11): 2260–7.
- Baumeister RG, Seifert J, Wiebecke B, Hahn D (May 1981). "Experimental basis and first application of clinical lymph vessel transplantation of secondary lymphedema". *World J Surg* **5** (3): 401–7.
- Baumeister RG, Frick A (July 2003). "The microsurgical lymph vessel transplantation". *Handchir Mikrochir Plast Chir* (in German) **35** (4): 202–9.
- Springer S, Koller M, Baumeister RG, Frick A (June 2011). "Changes in quality of life of patients with lymphedema after lymphatic vessel transplantation". *Lymphology* **44** (2): 65–71.
- Weiss M, Baumeister RG, Hahn K (November 2002). "Post-therapeutic lymphedema: scintigraphy before and after autologous lymph vessel transplantation: 8 years of long-term follow-up". *Clin Nucl Med* **27** (11): 788–92.
- Campisi C, Eretta C, Pertile D, *et al.* (2007). "Microsurgery for treatment of peripheral lymphedema: long-term outcome and future perspectives". *Microsurgery* **27** (4): 333–8.
- Koshima I, Nanba Y, Tsutsui T, Takahashi Y, Itoh S (May 2003). "Long-term follow-up after lymphaticovenular anastomosis for lymphedema in the leg". *J Reconstr Microsurg* **19** (4): 209–15.
- Campisi C, Davini D, Bellini C, *et al.* (2006). "Is there a role for microsurgery in the prevention of arm lymphedema secondary to breast cancer treatment?". *Microsurgery* **26** (1):

70–2.

- Chang DW (September 2010). "Lymphaticovenular bypass for lymphedema management in breast cancer patients: a prospective study". *Plast. Reconstr. Surg.* **126** (3): 752–8.
- Campisi C, Davini D, Bellini C, *et al.* (2006). "Lymphatic microsurgery for the treatment of lymphedema". *Microsurgery* **26** (1): 65–9..
- Yamamoto T, Narushima M, Doi K, *et al.* (May 2011). "Characteristic indocyanine green lymphography findings in lower extremity lymphedema: the generation of a novel lymphedema severity staging system using dermal backflow patterns". *Plast. Reconstr. Surg.* **127** (5): 1979–86.
- Ogata F, Narushima M, Mihara M, Azuma R, Morimoto Y, Koshima I (August 2007). "Intraoperative lymphography using indocyanine green dye for near-infrared fluorescence labeling in lymphedema". *Ann Plast Surg* **59** (2): 180–4.
- Brorson H.(1997). “ Complete reduction of lymphoedema of the arm by liposuction after breast cancer” Scandinavian Journal of Plastic and Reconstructive and Hand Surgery 1997; 31: 137-143