

LETTER TO THE EDITOR

I read the paper “Lymph circulation In the breast after radiotherapy and breast conservation” by L. Perbeck et al, which appeared in the March 2006 issue of *Lymphology* (1), with a great interest. The authors tried to estimate lymph flow from the breast two to five years after irradiation and lumpectomy. An interesting approach, as we pay most attention to the arm where most edema is being formed, neglecting how does treatment affect lymph flow in the breast tissue. Post-surgical breast lymphedema cases are seen more and more frequently after conserving surgery. The data obtained by authors seem to me to be rather unexpected. They report a 4-fold increase in lymph flow (!) in the operated, irradiated breast, where obstruction to lymph flow normally takes place. We would rather expect a decreased lymph flow. I would argue with author’s interpretation of results. First, a definition or short description of what authors understand under “lymph circulation” is needed. Is it a unidirectional flow to the axilla? Unclear is also the enigmatic term “lymphatic transport reserve.” The tracer was injected in a relatively large volume of fluid and because of that could immediately be spread in the tissue. It would, then, be important to know how large was the gamma camera acquisition area, in other words, whether the whole breast was scanned. One or two examples of lymphoscintigraphy would certainly answer this question. It would also

be interesting to know whether the authors measured accumulation of radioactivity in the liver. We know that permeability of blood capillaries in the previously irradiated areas is increased, and the tracer could find its way directly to the blood circulation. Since the authors present data without range, an important question is whether there were cases with a ratio below 1.0, which I expect is very likely. That would make statistical interpretation by the reading person much easier and maybe show lack of differences, for example, between the cancer operated, irradiated and benign operated, non-irradiated breasts. My interpretation of the data would be not an increased lymph flow but rather very fast spread of tracer in the dilated interstitial space and fine lymphatics, what we used to call “dermal backflow,” and probably some absorption of tracer by the permeable blood capillaries.

REFERENCES

1. Perbeck, L, F Celebioglu, L Svensson, et al: Lymph circulation in the breast after radiotherapy and breast conservation. *Lymphology* 39 (2006), 33-40.

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AUTHOR'S RESPONSE:

Professor Olszewski asks for a definition or a short description of what we meant by "lymph circulation." Our description of lymph circulation is that it is a unidirectional flow to the axilla, even if we did not measure any uptake in the axilla. He also wants clarification of what we meant by "lymphatic transport reserve." In the paper we describe on page 38 the relationship between the normal transport capacity, which is the normal lymph flow in the tissue, the maximum lymph flow, which is the maximum lymph flow before lymphedema develops and the lymphatic transport reserve which is the difference between the normal transport capacity and the maximum lymph flow before lymphedema develops. We measured the elimination of the tracer from the subcutaneous tissue during 60 minutes. Both breasts were scanned at the same time and the gamma camera had a diameter of 40 cm (*Fig. 1*). We did not measure the accumulation of the dye either in the axilla or in the liver. We present the absolute ^{99m}Tc-nanocolloid, half-life (min) data as median and interquartile range, which is the range between 25% and 75% of the values in *Table 1* (page 36) and the ratio individual operated side: non-operated side. It is not meaningful to give a range between the relative measured medians in the different groups.

We were also surprised at the fourfold increase in elimination of the indicator. We have in an earlier study measured the subcutaneous and intraglandular blood flow by ¹³³Xenon-clearance in irradiated breast after breast conservation surgery, and we did not find any change compared to the contralateral breast (1). We think that the increase in lymph flow in our study 2-5 years after radiotherapy both after 50 Gy and 2-4 Gy and also surgery can be

explained by the relatively small change in inflammatory reaction in the tissue. These results can also be supported by the study of Professor Olszewski and co-workers presented at the XX International Congress of Lymphology in Salvador, Brazil, in 2005, "Bone fracture and healing evoke response of the regional lymphatic (immune) system OP-039" (p. 46, Abstract Booklet), where they demonstrated that patients with leg fractures after 7 months show an increase in lymph circulation measured by lymphoscintigraphy by 2.44 in the calf and 2.17 in the thigh and 1.78 in the inguinal nodes compared to the contralateral limb. Professor Olszewski's interpretation of our data may be correct but it is difficult to prove.

REFERENCE

1. Perbeck, L F Celebioglu, R Danielsson, et al: Circulation in the breast after radiotherapy and breast conservation. *Eur. J. Surg.* 167.(2001), 497-590.

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