Effects of breast reconstruction on breast cancer-related lymphedema: a systematic review and meta-analysis

Ying-Ying Liu

The Result:
Current evidence from trials supports the effectiveness of breast reconstruction after breast cancer surgery in decreasing the rate of lymphedema.

In total, 7 prospective cohort trials with a total of 4402 patients were identified. Moreover, significant relevance was found between the reconstruction and no reconstruction groups regarding the incidence of lymphedema, with a risk ratio of 0.59 and a 95% confidence interval (CI) of 0.45 to 0.77 in the Mantel-Haenszel random pooling method.

Introduction
The purpose of this review is to examine the possibility that breast reconstruction could improve or even cure lymphedema in patients after surgical treatment of breast cancer.

The effect of breast reconstruction on lymphedema
Our analysis showed that breast reconstruction did have a favorable effect on decreasing the incidence of lymphedema in two pooling models (RR=0.59, 95% CI 0.45 to 0.77, P=0.0001 in the Mantel-Haenszel random pooling model).

Publication bias
After performing Begg’s linear regression model, no publication bias was found among all of the available studies in the overall meta-analysis (Begg’s test, P=0.230), indicating the stability of our results.

Sensitivity analysis
Considering the high heterogeneity found in the overall analysis, we further conducted the sensitivity analysis for 7. All studies were included in the lower CI limit and upper CI limit, indicating that the stability of calculation result was good.

Subgroup analysis
Exploratively, we analyzed three articles which measured arm volume in the Mantel-Haenszel random pooling model (RR=0.67, 95%CI 0.50 to 0.90, P=0.007). The analysis still favored breast construction in terms of lymphedema.

The meta-analysis still had some limits. Because the included 7 studies were all prospective cohort trials, the nonrandomized grouping ways possible make a difference to experimental results. We hope this study will attract more practitioners and academia to deep study in this field.