

# Treatment of Capsular Contracture After Radiotherapy in Breast Reconstruction

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Dear Editor,

Breast prostheses are made for cosmetic reasons and in order to reduce defective body perception and psychosocial trauma caused by the absence of breast tissue. Silicone breast prostheses are frequently used in breast reconstruction after breast augmentation or mastectomy. Safety and efficacy criteria are considered when applying silicone breast prostheses. Non-toxic, immunogenic, teratogenic, carcinogenic, and lack of potential effect on mammography determine its reliability; development of capsular contracture, deflation, palpation and the possibility of folding in the anatomical pouch is determined by its effectiveness. The fillers and implant options used in consideration of these criteria are also limited in time and the ideal ones are introduced in medicine (1-4).

The most common complication after reconstruction or augmentation with silicone implant is the formation of constrictive fibrous capsules around the implant. This causes fibrous tissue capsule contraction. The contraction is caused by pain in the breast, hardening, and asymmetry in the breast. It has been reported that between 1.3% and 30% of the patients with implant have developed capsular contractures. Approximately 92 percent of contracture occur within the first 12 months after surgery. The longer the implants settle, the higher the risk of contracture occurring cumulatively. Although bacterial colonization, implant surface characteristics, hematoma formation and radiation are found to be associated with etiopathogenesis, the cause and pathogenesis is still not known. In order to prevent the formation of capsule contracture, various methods the prosthesis pouch with various substances, using fibrin glue, preventing hematoma, using silicone outer surfaces in different tissues and placing the prosthesis in different anatomical locations were tried. However, the exact treatment is not available at present (3-8).

Nowadays, mastectomy is applied to the patients concurrently with surgery, 2 weeks after mastectomy or in patients who will receive RT after 3 months. In breast cancer cases, subcutaneous mastectomy with simultaneous expander and implant and breast reconstruction are common methods. It is not clear yet which of these three applications is a more reliable method. When radiotherapy (RT) is applied in breast cancer patients with silicone prosthesis, it is very important for the treatment of prosthesis in the treatment area and the complications that may occur. It has been reported that silicone breast prostheses have no negative effect on photon and electron dose distribution. In addition, it was determined that the silicone elastomer used in breast prostheses did not reduce the radiation transmission (9). There is not enough information in the literature regarding the prevention / treatment of complications in prostheses after RT. In studies performed, it was shown that complications of complications such as capsular contracture (1.3-15%) and worse cosmetic results and reconstruction after radiotherapy treatment have increased in patients with breast reconstruction with silicone implant (2, 3, 6-8). However, most of the current studies are retrospective cohort studies and there is no prospective study. The effects of radiation on the formation of capsules are tried to be explained. Recent studies have shown that the transforming growth factor- $\beta$  (TGF- $\beta$ 1) is an important factor in the formation of fibrosis and radiation-induced capsule formation. Positive results have been reported in studies to prevent these effects by inhibition of TGF- $\beta$  signal transduction (3). Evans et al. (4) performed breast reconstruction with implants and compared the contracture stage, pain and extrusion in patients with RT without RT. They reported that radiotherapy increased the capsular contracture stage (Baker III, IV) and had significant negative consequences for the clinical appearance and patient satisfaction. Azzi et al. (5) reported that radiotherapy accelerated the process of capsular contracture around the silicone implant in a study of 105 patients.

Nowadays, the increase in the studies on the use of implants has led to an increase in the studies to investigate the agents for prevention of implant complications. Chung and colleagues reported that simvastatin was effective in reducing radiation-induced capsular fibrosis around silicone implants in rats (6). Cook and his colleagues treated mastectomy with adjuvant radiation-induced breast prosthesis for 30 days with Trental and Vitamin E for 180 days. Three patients underwent implant revision. In 2 cases developed contracture. In conclusion, it was reported that combination of Trental and Vitamin E could prevent serious contractures and implant losses (8). In the recent meta-analysis, the use of biological cellular dermal and synthetic matrices in combination with a tissue expander or an implant has been reported to slow the progression of capsule formation and fibrosis (6).

In the literature, it was observed that patients who received RT after breast reconstruction were not informed about the risks of connective tissue disease, autoimmune disease, or tumor development, and that no laboratory or clinical evaluation was performed to determine possible systemic disease development. In addition, there is no data to evaluate the risk of cancer recurrence, delayed adjuvant therapy, and health-related quality of life in this group of patients.

As a result, there is no agent to prevent the complications of prosthesis in patients who will undergo postoperative radiotherapy after oncologic surgery and in implant and breast operations. Breast cancer patients who have breast prostheses should be followed for a long time in terms of cancer recurrence, connective tissue disease, autoimmune disease, or tumor development risks. Patients with signs and symptoms of systemic disease should be identified and laboratory investigations and clinical evaluation should be performed. Studies on this subject are needed.

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