

Direct-to-Implant pre-pectoral breast reconstruction with light weight implant in previously irradiated patients comparing to standard weight implant: a single-centre preliminary experience

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Breast recurrence following conservative surgery for invasive cancer and radiotherapy should not exceed 15% at 10 years. Depending on the number of cases treated annually in various breast units, this group of patients could represent a significant subset. Total mastectomy is the recommended surgical treatment although some authors have recently suggested a repeat conservative approach. Furthermore, Nipple Sparing Mastectomy (NSM) in this patients is a higher risk procedure in a higher risk population.

Patients with previously irradiated breasts face an elevated risk of complications when undergoing mastectomy, particularly when reconstruction is involved. Radiation therapy can cause vascular damage increasing the likelihood of risk of mastectomy flap or Nipple Areola Complex necrosis. For this reason, autologous tissue reconstruction is typically preferred over textured implant-based reconstruction in irradiated breasts; however many patients are reluctant to undergo this more invasive procedure.

We used lightweight implant to reconstruct patients with previous irradiated breast assuming that the minor stress over the mastectomy flap due to the lower weight could reduce compression to the damaged vessels and so to preserve the vitality of the breast skin envelope with excellent aesthetic results. This reduction in pressure may also lead to improved outcomes by decreasing the likelihood of ischemia, fat necrosis, fibrosis exacerbation and wound healing complications in the postoperative period.

This study aimed to evaluate the rate of postoperative ischaemic and general complications following direct-to-implant pre-pectoral reconstruction with light weight implant in irradiated breast compared with a control group reconstructed with standard weight implants.

10 patients (14 breasts) were submitted to NSM after breast RT from June 2023 to February 2024 at our centre. In nine patients (90%), RT had been performed following conservative surgery for breast cancer, while in one patient (10%), RT was given for Hodgkin lymphoma, which later developed into breast cancer. The results were compared with 36 case control patients (NSM after conservative plus RT and reconstructed with standard weight implant that were operated between February 2019 and January 2024. With statistical analysis, the light weight reconstructed group presented with a mean time of 6.1 months (3- 10) of follow-up, no one implant removal (0% vs 22.1% $p=0.054$) and non-statistical significant lower rate of minor complications (14.3% vs 16.6% $p=0.84$) respect to the control group with standard weight implant with mean follow-up 35 months (8-67). The comparison also proved that the minimum of 8 months follow up in the test group is sufficient since we saw in the control group that all major events occurred within less than 5 months. In the long term, these effects may improve cosmetic outcomes, leading to softer and natural-feeling reconstructions but a longer follow-up is needed.



One stage reconstruction with light weight implant in previously irradiated breasts may reduce the risk of ischaemic complications with less postoperative pain and minimal kinematic alterations. These findings also support the hypothesis that lightweight implants, by reducing the gravitational and accelerative forces experienced in daily activities, could decrease the complication rate in irradiated breast reconstruction over the long term. While these results are promising, further investigation with a larger cohort is necessary to fully evaluate the benefits of lightweight implants in this patient population.