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CASE REPORT

Breast Brachytherapy and a Case Report

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SUMMARY

For women who had breast-conserving surgery (BCS), brachytherapy can be used along with external beam radiation as a way to add an extra boost of radiation to the tumor site. It may also be used as a form of accelerated partial breast irradiation. Tumor size, location and other factors may affect brachytherapy decision. The patient was 47 years old and applied to Istanbul University Oncology Institute Radiation Oncology Department. A mass in the upper outer quadrant was detected. Invasive ductal cancer was diagnosed with biopsy. MKC and sentinel lymph node biopsy were performed in 2013. Histological and nuclear grade II, ER (+++), PG (+++), cerbB2 (-), lymphovascular invasion (-), pT1N0 was revealed. In 2013, 50 Gy/25 frx ERT was applied to the left breast tangent. After 16 days, HDR was performed twice daily (BID) (4x3Gy), 14-channel ISI breast implants. The reference dose is defined as 3 Gy GTV.

Keywords: Brachytherapy; breast cancer.

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Introduction

Breast-conserving surgery and radiotherapy are the standard treatment methods for early-stage breast cancer. Tumor bed recurrence rate after BCS is 60%–85%. Local control increases with a boost of 45–50 Gy and 10–16 Gy.[1,2] Recurrence in breast cancer is often around the tumor. The idea that irradiation of the primary tumor bed instead of the whole breast tissue is sufficient for local control has improved the approach of partial breast radiotherapy.[3,4] Briefly, it is the application of brachytherapy (BRT) within a margin of 1–2 cm to the primary tumor bed instead of the whole breast tissue. The treatment is completed in as short as 2 weeks with high-dose administration. It also improves patient compliance. This application can be applied in BRT and intraoperatively, and both have advantages and disadvantages. However, most commonly BRT involves interstitial (ISI) and intracavitary practice. These applications can be in the forms of LDR, HDR, or PDR. Catheters can be intraoperatively or postoperatively placed.

Case Report

The case patient was aged 47 years who presented to Istanbul University Oncology Institute Radiation Oncology Department. A mass was detected in the upper outer quadrant, and invasive ductal cancer was diagnosed by biopsy. MKC and sentinel lymph node biopsy were performed in 2013. The following findings were revealed: histological and nuclear grade II, ER (+++), PG (+++), cerbB2 (–), lymphovascular invasion (–), and pT1N0. In 2013, 50 Gy/25 frx ERT was applied to the left breast tangent. After 16 days, HDR was performed twice daily (4×3 Gy), and 14-channel ISI breast implants were used. The reference dose was 3 Gy GTV (Figs. 1–2).

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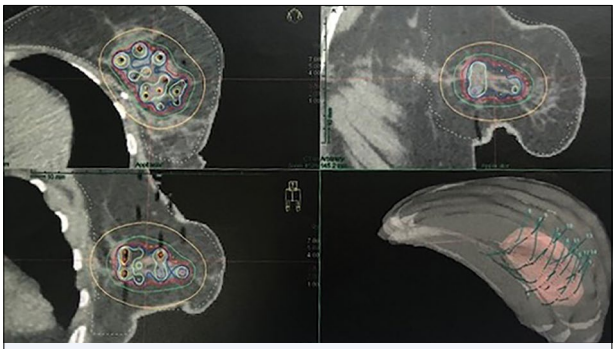

Fig. 1. Dose distribution after breast implantation.

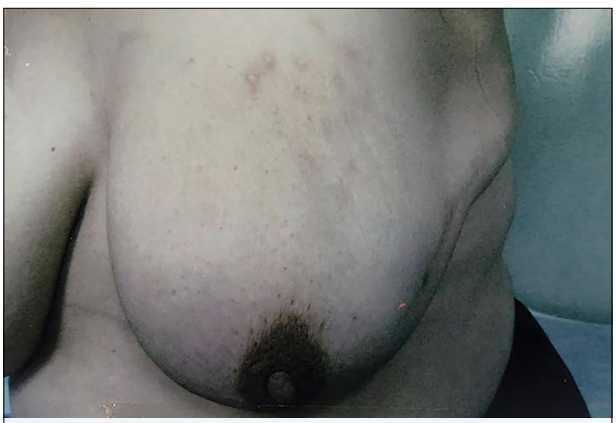

Fig. 2. Cosmetic results after 1 year.

Discussion

Because of its high-dose distribution, ISI implant is preferred for patients with large mammalian, deep-seated tumors and those with surgical margins.[2] It is recommended to apply 12–20 Gy of 4–6 frx in HDR and be placed in an ISI implant under local anesthesia. In a study by Gabani et al., 175 patients who underwent accelerated partial breast irradiation (APBI) with accelerated ISI-HDR had high survival, local control, and good cosmetic results.[5] In previous randomized studies, no difference was found between ISI-BRT and electron treatments between survival and local control.[6-10]

In intracavitary BRT applications, silicone balloons of 4–6-cm diameter and 1–8 channel catheters can be used. A balloon is inflated with saline after its placement in the lumpectomy cavity. The prescribed dose is planned 1 cm beyond the surface of the balloon.[11] The most common dose for HDR is 3.4Gy for each frx, in total 34 Gy (5 days, twice a day). CT, MR, USG, and clips for CTV definition can be used.[12,13] In breast BRT, treatment of small implant volumes may result in high recurrence.[14] Therefore, a margin of 2 cm around the lumpectomy cavity is recommended as it increases local control. Excellent cosmetic results and local control were obtained with balloon-based BRT in APBI studies.[11,15] Additionally, Vicini et al. found that a large tumor (>2 cm) and smaller skin sparing (<7 mm) were the crucial independent predictors of cosmesis.[13]

Conclusion

Based on a large number of studies, BRT is considered a safe and effective method for appropriate patients. Since it is an invasive and complicated technique, it should be applied in experienced centers.

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