

Clinical Assessment of Acute Skin Reactions after Post-Mastectomy Radiotherapy in Breast Cancer Patients

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Abstract: Radiation induced dermatitis is very common in patients of breast cancer treated with radiotherapy. We assessed 48 patients treated with radiotherapy at Gujarat Cancer & Research Institute after modified radical mastectomy for skin reactions, immediately after the completion of 50Gy/ 25# of radiation therapy. Grading of acute skin reaction was done according to the RTOG Grading System. Grade 1 reaction was observed in 79% of patients, and Grade 2 reaction was observed in 6% of the patients. No change in skin, that is grade 0, was found in 15% of patients. None of the patients had Grade 3/4 reactions. We identified that quality of life of the patient is impaired due to pain caused by the radiation reactions, and hence patient education is an important part of the management. Acute skin toxicities may lead to interruption in the treatment protocol leading to compromise in effect of radiation.

Keywords: breast cancer, radiotherapy, acute skin toxicity, grading.

1. Introduction

Breast cancer has outnumbered cervical cancer as the most frequent cancer in females worldwide [1]. Radiation therapy is a part of the multidisciplinary approach in the treatment of breast carcinoma. During or immediately after radiotherapy therapy, early effects such as erythema and desquamation usually appear. Generally, the sequelae of radiation follow a distinct clinical pattern. Erythema can develop on the skin of treated patients within a few hours of exposure and can persist or slowly worsen until the end of radiotherapy treatment. This can progress to dry desquamation and further to wet desquamation. In severe case, ulceration and necrosis may develop [2].

2. Aims and Objectives

We intended to study skin reactions in patients with breast cancer after radiotherapy to understand manifestations of skin reactions and the variation in the same. Skin changes caused by radiotherapy in breast cancer negatively affect numerous aspects of women's quality of life, including: physical well-being, body image, emotional well-being, functional well-being, and treatment satisfaction [3].

3. Methods & Materials

- The study includes 48 patients of carcinoma breast who were treated with adjuvant radiotherapy after modified radical mastectomy
- Radiotherapy was given as a total dose of 50 Gray in 25 fractions as 2 Gray per fraction in 5 days a week with a 6 MV linear accelerator
- Patients were treated with bilateral parallel opposed medial and lateral tangential fields for the chest wall and single anterior field for supraclavicular and axillary field
- Skin reaction immediately after the completion of the radiotherapy were observed

- Grading of radiation induced dermatitis was done according to the RTOG Grading system:

Table 1: RTOG Grading

RTOG Grade	Skin Reaction (Acute)
0	No symptoms
1	Follicular, faint or dull erythema / epilation / dry desquamation / decreased sweating
2	Tender or bright erythema, patchy moist desquamation / moderate edema
3	Confluent, moist desquamation other than skin folds, pitting edema
4	Ulceration, hemorrhage, necrosis
5	Death

4. Observations & Results

4.1 Observations



Figure 1: Grade 1 Skin Reaction



Figure 2: Grade 2 Skin Reaction

4.2 Results

Table 2: Post Radiotherapy Skin Reaction Grading

RTOG Grade	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Post RT(%)	15%	79%	6%	0%	0%	0%

Maximum number of patients in this study (79%) had dark pigmentation and dry desquamation of the skin of the chest wall, that is, grade 1 skin reaction. There was no change in the skin in 15 % of the patients. Grade 2 skin toxicity was observed in 6 % of the patients.

5. Discussion

Acute radiation injury occurs within hours to weeks after radiation exposure and it results from immediate structural tissue damage, generation of short-lived free radicals, irreversible double-stranded breaks in nuclear and mitochondrial DNA, and initiation of an inflammatory response in the epidermis and dermis [4], [5]. The accumulation of different radiation-induced changes to dermal vasculature, appendageal structures, and epidermal stem cells results in the progression of radiation dermatitis through different stages. Radiation dermatitis has a profound impact on the quality of a patient's life, due to pain and discomfort. In addition it may result in premature interruption of radiation therapy, resulting in inadequate disease treatment [6].

According to a study by Rossella et al., 72% of patients presented a G1 cutaneous toxicity, 18% developed a G2 cutaneous toxicity, 10% developed G3 toxicity, no one presented G4 toxicity [7]. These results are consistent with the present data.

Acute radiation injury occurs in 90-95% of the patients undergoing radiation therapy and chest wall is one of the commonest site [8]. Patient education regarding the acute manifestations of radiation is a must.

6. Conclusion

Our target in the radiation treatment of carcinoma breast patients post mastectomy is the skin and the chest wall, hence

some amount of skin reaction is desirable. According to some researchers it correlates with the local control rates observed [9].

However, excessive skin toxicity may cause pain and discomfort to the patient leading to discontinuity or break in the treatment. Literature suggests that it can be dependent on dose, severity of disease, genotypic and phenotypic profile of the patient, and many such factors [10].

We intend to further study the correlation of these characteristics, to understand factors driving side-effects and its correlation with the local control rates.

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