International Journal of Physical Education and Sports Sciences
Vol. 13, Issue No. 01, January-2018, ISSN 2231-3745

Breast Edema, From Daily Life: The Stage of the Art. To Treatment

P. Yashwanth Kumar*

Associate Professor, Department of Physiotherapy, Galgotias University, Greater Noida, Uttar Pradesh, India

Abstract – While various etiologies can cause breast edoema, they are mostly seen after breast preservation and/or radiation therapy. The combination of breast conservation and radiation therapy disrupts the lymph system and causes tissue reactions to support breast edoemas. Much flavour and raise the breast's scale. Breast inflammation isn't the main criteria for breast edoema. The literature typically focuses on orange skin, breast weights, thickening of skin, breast discomfort, redness of skin, hyperpigmented pores of the skin, and positive signals. Breast edoema may be debilitating, may influence the quality of life of patients with difficulties, and the benefits of breasts. In contrast, the literature and the arm lymphedema, which are well-known in clinical practise and medicine, lack the breast odema and underestimate it less. At this point, a number of items must be updated.

This master class is intended for the treatment and surveillance of breast cancer patients with state-of-the-art breast edaemas both health care practitioners and scholars. Whose diagnostic, longitudinal and behavioural perspectives span the current and future. Furthermore, recommendations for clinical procedures and further trials are addressed. It is advised that patients whose signs of breast edoema may not decrease within 6 months after radiation treatment is terminated are thoroughly monitored and treated appropriately. Although there is currently no proof of breast edoema treatment, we highly advocate complex decongestive therapy analogy with extremity lymphedema treatment. Skin recovery, exercise and massage are used with this. In addition, the usual course of breast edoema progression ought to be told to all patients.

Key Words – Breast Edema, BCS, Diagnosis, BrEQ¸ Longitudinal

----------♦----------

1. INTRODUCTION

Among women in the western world breast cancer is the most prevalent disease. Over the years, breast cancer intervention has progressed into more traditional treatments, such as breast preservation (BCS). In certain cases, this therapy includes radiotherapy, in addition to local excision. BCS, followed by radiotherapy, is an efficient and straightforward way to treat people with early breast cancer. Some patients, though, may be impaired by the breast oedema in the controlled and irradiated breast In tandem with adjuvant radiation therapy, though, priority is increasing such that patients obtain BCS. Breast edoema can occur all aspects of this procedure. The operation itself will affect the lymphatic system, which will contribute not only on the arm but in the breast to a damaged transport capability. However, radiation, which triggers different tissue reactions like edoema, is the biggest contributor. Breast edoema may also involve obstruction of the vein and the lymph. Breast size can be increased by more than one cup in patients with breast edoema. In addition to elevated bridge volume, other common parameters seen in the literature include skin orange, weight of the breasts, skin redness, breast pain, skin tightness, hyperpigmented pores, and an indicator of positive rash. Some articles however do not describe breast edoema as a description, making interpretation challenging. Breast edoema may often be present without overt swelling when the lymphedema's key properity is swelling, marked by shifts in skin, breast duress and discomfort. Irradiation allows the fat tissue to harden. Because a woman's breast is full of adipose tissue, the changes will probably occur after radiation.

In addition to breast cancer treatment and Radiation therapy, breast edoema may include some less popular etiologies: Fat necrose, trauma, congestive heart failure, ect. Therefore, it is very critical to provide a correct diagnosis and include suitable guidance or medication regarding patients' health history and review. Breast edoema from other etiologies also has a chronical stage in contradiction to the natural pattern of the breast edoema caused by BCS and radiotherapy.

Breast edoema classified as various phases. Delay et al. Stage 1 is marked by thickening of the skin while remaining constant in breast length. In stage 2, it is a conspicuous oedema that may contribute to

asymmetry between the two breasts. In acute breast edoemas hospital operations and radiation may also be as much as 300 ml. Stage 2 frequently contains expansive pores of the skin known as orange skin, heaviness, fatigue, and the affected breast. Step 3 is close to stage 2, but pain is even more extensive at this stage. 2 breast edoema components are defined by Wratten et al. Firstly, widespread breast tissue expansion or swelling, which is called a parenchymal breast oedema, is possible. Secondly, edematal changes can be observed in the epidermis and dermis, defined as the edoema of the dermis. No systematic procedure for the assessment of breast edoema is essential, in addition to the absence of a consistent breast edoema specification. The most common literature technique is physical examination. Such means of measurement are Mammography, Ultrasound, TDC (MoistureMeterD) and/or questionnaires for the tissue dielectric constant (TDC). Based on a systemic literature review, BCS and radiotherapy show an overall breast edoema rate ranging from 0% to 90.4%. This range encompasses a wide range of breast edoemic assessment processes and principles. In addition, the details on breast edoema treatment are also lacking. Consequently, we present in this paper guidelines centred on existing understanding of the treatment of limb lymphedema, in particular the complicated treatment of decomposition (CDT). This master class is focused on the comprehensive study by means of clinical trials and the initial prospective studies in the form of a doctoral dissertation on existing scientific literature, Pubmed, Embase, The Web of Science and Cochrane. Furthermore, it is clinically focused. The goal is to include the state of the art breast oedema in the management and surveillance of breast cancer patients for both health care staff and researchers concerned. Which provides present and prospective diagnostic, longitudinal and recovery viewpoints. It contains professional practise guidelines and prospective study recommendations.

2. MANAGEMENT OF BREAST EDEMA

2.1 Diagnosis

The subject of breast edoema was published in 2014 with a detailed systematic analysis which concluded that there was a lack of a standardised protocole for breast oedema and a consistent description of diagnosis. The most common method to test breast edoemas by inspection, palpation and anamnesizing of the symptoms of breast edoema is the clinical examination. Medical breast photographs may be obtained for a more precise assessment of development. Several imaging methods, e.g. high frequency ultrasound, are also recorded in literature (HFUS). HFUS clinical symptoms of breast edoemas are about 2 mm thickening of the skin. Deeper echogenicity and the combination of interstitial fluid results in echogenicity, disturbance or vision. Fluids as white areas are clearly identified by MRI, for example, as parenchymal or skin edoemas. parenchymal breast edoema TDC, calculated by the MoistureMeterD, is another method which can provide details about the breast edoema. The unit will test water at depths of 2.5 mm from a local tissue. A ratio of TDC, equivalent to or greater than 1.40, It is considered a breast edoama between the affected and the exposed breasts. The prevalence of breast edoema depends quite much on the various meanings and evaluation techniques. The Breast Edema Questionnaire took this conclusion into account (BrEQ). This Netherlands survey is the first to evaluate the breast edoema in patients with breast cancer with proof of validity and reliability. The synthesis of the symptoms described in BrEQ may also serve as a mechanism for developing a normal breast edoema concept. Symptoms of breast edoema was measured from 0 to 10 in the first section of the survey: nausea, heaviness, stiffness, tense face, redness, pitting, swollen pores of the skin and dureté. In Section 2, many task limits and constraints on attendance have been scored from 0 to 10, taking into consideration the International Classification of Functioning, Disability and Health (ICF). In a population of BCS and radiotherapy patients, clinimetric properties of BrEQ were evaluated. Table 1 provides an outline of these clinimetric properties. The BrEQ is an accurate and accurate Netherlands test for breast edoema evaluation. There is also a cut-off limit of 8.5. In this score, patients with and without edoema are distinguished. In conclusion, BrEQ is a valuable instrument in clinical practise for the evaluation and diagnosis of breast edoema and its effect on everyday functioning.

Table 1: Clinimetric properties of the Breast Edema Questionnaire (BrEQ)

Clinimetric property	Breast edema symptoms (part 1)	Activity limitations / participation restrictions (part 2)
Content validity	Good for part 1 and part 2	
Convergent validity	Breast symptoms separately correlated moderately with skin thickness Total symptom score correlated strongly with skin thickness	Total score of activity limitations correlated moderately with - global health status (subscale EORTC QLQ C30) - physical functioning (subscale EORTC QLQ C30) - role functioning (subscale EORTC QLQ C30) - total score of the McGill Quality of Life Questionnaire Total score of activity limitations correlated strongly with - physical wellbeing (subscale McGill QOL questionnaire)
Known-groups validity	Patients with breast edema (diagnosed with BI) have a significant higher total symptom score compared to patients without breast edema	Patients with breast edema score significantly higher on activity limitations compared to patients without breast edema
Test-retest reliability	Reliability is strong for the total symptom score Reliability is between strong and moderate for the separate symptoms	Reliability is strong for the total score of activity limitations
Cut-off value	A score cut-off point of ≥8.5 discriminates between patients with breast edema and those without (therefore a score of 9 or higher warrants the diagnosis of breast edema)	/

2.2 Longitudinal course

Several researchers have investigated and shown related results over time the normal progression of breast oedema. Table 2 provides a summary of the literature accessible in which all tools for evaluating and defining breast edoema are included. A peak of prevallence after radiation therapy has been found in female breast cancer patients who have undergone BCS with radiation therapy. In the subsequent

months a progressive random decrease can then be predicted.

Table 2 Time course of breast edema in scientific literature

Reference	Follow-up	Breast edema prevalence
Verbelen (own data, not published)	Prior to RT	52.5%
	After termination of RT	63.8%
	3 months after RT	55.3%
	6 months after RT	57.1%
	12 months after RT	47.5%
Adriaenssens 2012	0–3 months postoperative	93.3%
	3–6 months postoperative	73.3%
	6–12 months postoperative	82.4%
	12–24 months postoperative	80.6%
	24–60 months postoperative	65.4%
Berrang 2011	Prior to RT	32%
	1 year after RT	16%
	3 years after RT	6%
Vicini 2007	> 6 months after RT	32%
	> 24 months after RT	22%
	> 36 months after RT	0%
Young-Afat 2019	Baseline: prior to RT	12.0%
	3 months after baseline	7.1%
	6 months after baseline	12.4%
	12 months after baseline	8.2%
	18 months after baseline	5.5%
Olivotto 1996	Prior to RT	26.6%
	3 year after RT	4.3%
	5 years after RT	2.6%
Johansson 2015	Prior to RT	29%
	2 weeks after RT	39%
	3 months after RT	63%
	6 months after RT	63%
	12 months after RT	39%
	24 months after RT	28%
Lam 2020 (meta-analysis)	0–4 weeks after RT	26.2–47.1%
	6 months – 10 years after RT	7.2–9.9%

The most research is focused on the RT timing to explain the time course of breast edoema, with the exception of Adriaenssens etc. No postoperative data are required on the amount of time

Based on Lam 2020 (meta-analysis), 7-10% of patients will require BCS and radiotherapy-induced BCS medication for their breast edoema.

2.3 RT radiation therapy

The BrEQ-scores are seen in Figure 1 for 80 to 12 months after radiotherapy. Few research have longitudinally examined his degree. The time course of skin edoema dependent on the rise in epidermal thickness, measured with the USA, was outlined by Wratten et al. Epidermal thickness normally peaks 4 to 6 months after care in the majority of patients with BCS and radiotherapy and in most cases indicates 12 months post-treatment reversion to baseline.

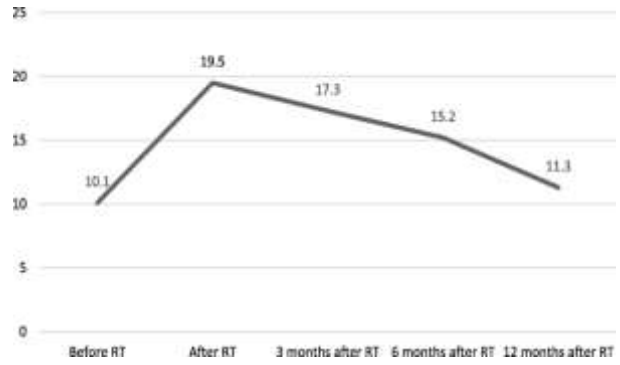

Fig. 1 BrEQ-scores on a total score of 80 on different time points

Until radiation treatment in certain women, breast edoema is existing. There are many reasons that may justify this. Firstly, because of disruption to the lymph system, BCS itself induces breast edoema. Secondly, a common postoperative conditions such as discomfort, swellings, tensed muscle, and so on, which in reality are not specifically correlated with breast edoema, can be erroneously caused after BCS.

A spontaneous decrease in breast edoema symptoms can be referred to as temporary breast edoema within six months of end of radiation therapy. If no signs of return occur more than seven months after radiation, the breast effects are considered an edoema of the breast. We strongly encourage patients and community professionals who participate in the prevention and after treatment of patients with breast cancer to observe breast complaints carefully after radiation therapy. Treatment is not required where there are minor breast signs and/or intermittent breast edoema. Patients with chronic breast edoema and/or patients with extremely severe breast symptoms are advised to get the right care.

2.4 Conservative treatment of breast edema

The CDT, which is widely known as consensus therapy, is the latest evidence-based treatment for all kinds of lymphoedema. Some facets of the CDT are therefore up for discussion, including Manual Lymph Drainage (MLD). While there is no detailed literature on breast edoema, it is recommended that the CDT, which has been extensively presented for the extremities and breast edoema in the utmost measure be extrapolated. CDT is also the lymphedema consensus therapy consisting of four primary pillars: skin care, MLD, bandaging and/or clothing and workout. CDT consists of the following. The CDT consists of 2 stages. The aim of Phase 1 is to decrease swelling in the intensive stage. Step 1 has 4 components: skin treatment, MLD, bandaging and workout compression. Phase 2 is intended to preserve phase 1 performance. It has the same components as in step 1, except for compression,

and is usually supplied by compression clothing rather than bandages.

The aim of skin treatment is to keep the skin barrier healthy. Damaged and dry skin can become an infection entry point. Therefore the possibility of inflammation and potential worsened breast oedema can be minimised by proper skin hygienic, precautary interventions and wound prevention. Patients are advised to wash the face with neutral soaps every day, carefully dry the skin and use low pH lotions and emolients. Moreover, precautionary steps are advisable for patients. In addition to skin care, clinical literature supporting lymphedema generally recommends that you prevent trauma, quickly clean and manage bruises, sauna visits and obtain medical assistance if the skin improves. Additional patients' details can also be important, as potential for aggravating lymphedema has been shown. These guidelines are therefore based on the common sense of maintaining or achieving a healthy/normal BMI, protecting the skin from sunburn and wearing proper garments and bra. Table 3 presents a summary of the literature's risk factors, but agreement is missing between studies. In addition, the action of patients would not be reversible to these risk factors.

Table 3: Risk factors for breast edema

Related to radiotherapy	Increase in irradiated breast volume
	Increase in boost volume
	Photon boost
	Increasing breast separation
	External beam radiation (vs. intra-operative radiotherapy)
	Conventional radiotherapy (vs. intensity-modulated radiotherapy)
Related to surgery	Postoperative infection
Related to tumor characteristics	Larger tumor
Related to personal factors	Larger breast volume
	Increasing breast density
	Diabetes mellitus

MLD is another CDT pillar that can be carried out both intensively and during maintenance. MLD is a massage method aimed at encouraging lymph fluid movement out the swelling region and the absorption by the lymphatic system of the interstitial fluid. Though MLD is a proven method of care for extremity lymphedema in clinical practise, researchers also doubt the efficacy of MLD. The lymph fluid is drained towards the proximity of the lymph nodes and/or of the lymph nodes on the contralateral hand. Nevertheless, it is our latest recommendation that we remove MLD from the treatment of breast edoema while waiting for data on the role of MLD, since it takes time and expensive.

Compression is required during the intense process of CDT to reduce the amount of lymphedema with which the short, several layer bandages are widely used. However, it is impossible to properly and with enough strength to administer the bandages for the breast oedema, and often people find it difficult to wear them. A compression bra or compression sports bra form may also be given. This style of bra may be continued throughout the repair process. Particularly, there is little clinical support for women with breast edoema concerning compression therapy. A research by Johansson et al. examined breast edoema care with a compression-like sports bra with firm pressure flattening the breasts and contrasted it with ordinary bras. During the daytime for 9 months this form of compression was to be worn. Results found that this therapy for breast compression has little impact on breast edoema symptoms and on the volume of local TDC tissue water. It is also recommended to wear a compression-type sports bra only if it does not adversely affect the comfort. In addition, the signs of breast edoema are carefully monitored to interfere as needed. More study into this subject is of considerable significance. It is necessary to tell.

3. FOLLOW-UP ASSESSMENTS

Several evaluations should be conducted in order to identify the effects of therapy during the follow up of a woman hospitalised with breast edoema. BrEQ can be seen for the first time. As the BrEQ scores drop to below the cut-off point of 8.5 during the procedure, this represents a positive outcome. In addition, the impacts of breast edoema on quality of life and everyday life practises can be monitored in Part 2 of the BrEQ. Of necessity, a clinical review should be done regularly, in particular whether the pitting symptom has or has not entirely vanished. Breast edoema has been minimised where pitting is not present. The TDC evaluation is a more technical evaluation that can be carried out. In the presence of edoema, TDC ratios have been shown to be pronostic. No TDC ratios may be measured for patients with bilateral edoema. The progression of TDC- value may be tracked for these patients (a percentage of water).

4. CLINICAL IMPLICATIONS

Breast edoema can be an unavoidable severe complaint. Breast oedema etiologies are many, which makes it important to accurately diagnose the underlying disease. It is advised that all people who undergo this sort of care should at least be notified of the overlooked complaint in case of breast edoema following BCS and radiotherapy. Malignancy or other treatable conditions may be omitted in the case of an aetiology other than the breast edoema.

Edoema, redness, difficulty, and malaise can also be similar in breast edoema and dermatitis with radiation. Distinguishing between the two situations is not always possible. However, before radiation treatment, breast edoema can be present. We warn patients and health providers to carefully observe and assist in breast problems if possible. We recommend that BrEQ be used in conjunction with a clinical test to help diagnose and control breast oedema. This approach is fast and requires few material or money.

Breast edoema leads a normal pattern, in the months of radiation treatment we see a spontaneous deterioration. In addition, breast oedema is sometimes subclinical and, since breast complaints are minor, is often not reported and recognised by health professionals. The notification you get from home should include carefully monitoring and providing adequate treatment to patients who may not receive BrEQ within 6 months after radiation therapy ends. During breast cancer surgery we regularly prescribe a morbidity screening. Self-evaluation using a mobile or a checklist is both feasible.

Although there are already sparse evidence of therapy for breast edoema, the comparison of CDT with the lymphedema treatment of extremities should be recommended. However, since its proof is poor, we suggest omitting MLD. Thus, breast edoema rehabilitation includes skin preparation, workout treatment and compression.

Take home messages:

- BCS and radiation therapy treatments can be tracked up to 12 months after completion of radiation therapy
- The usage of BrEQ, A suitable way to detect and monitor breast edoema along with a physical examination.
- If after 6 months there is no random decrease in breast edoema and no other treatable source is identified, begin treatment of the edoema.
- The preferred medication now includes skin protection, compression, and workout therapy is CDT with the exception of MLD. However, there is still need for solid empirical proof.

5. FUTURE RESEARCH PRIORITIES

The development of a greater knowledge of breast edoema due to BCS and radiation therapy is crucial in longer-term studies. Particularly if certain patients still suffer from breast edoema years after surgery. A future studies will identify topics that can be helpful to determine if proper treatment or sufficient proof is necessary.

Physicians and scientists agree on the concept of breast edoema globally. Moreover, a common assessment tool must be considered, and can be used as a standard gold. In compliance with the ICF scheme, BrEQ should be considered as a gold standard by all deficiency areas. It is necessary to interpret the articles in the original Dutch edition (now in Spanish, Turkish and English) and to investigate the extent to which the things included in a traduced BrEQ represent adequately. Furthermore, where an updated version of BrEQ is used, researchers must be encouraged to report regularly.

With regard to breast edoema treatments, the efficacy of the CDT for breast edoema specifically must be shown by high-quality trials. In addition, it is necessary to study more the optimal pacing and basic content of the recovery programme. There may be a justification for other prevention methods such as fascia release procedures, although there is actually no proof of breast edoema. Additionally, more care and clinical studies can be focused on the treatment and importance of compression and workout therapy of skin problems (including scar tissue treatment if necessary).

6. CONCLUSION

Breast oedema, though little described in clinical literature, is a frequent complaint after BCS and radiotherapy. The health professionals working with breast cancer treatment should be provided with sufficient knowledge on diagnosis, the longitudinal path and the treatment of breast oedema, in order to enhance the care of these women.

REFERENCES

1. Ferlay J, Steliarova-foucher E, Lortet-tieulent J, Rosso S (2013). Cancer incidence and mortality patterns in Europe : estimates for 40 countries in 2012. Eur J Cancer.; 49(6): pp. 1374–403.
2. Thomas DB, Moe RE, White E (1999). Breast Conservation Therapy in the United States following the 1990 National Institutes of Health consensus development conference on the treatment of patients with early stage invasive. Published online: pp. 628–637.
3. Kwak JY, Kim EK, Chung SY, et. al. (2005). Unilateral breast edema: Spectrum of etiologies and imaging appearances. Yonsei Med J.; 46(1): pp. 1–7.
4. Harsolia A, Kestin L, Grills I, et. al. (2007). Intensity-modulated radiotherapy results in significant decrease in clinical toxicities compared with conventional wedge-based breast radiotherapy. Int J Radiat Oncol Biol Phys.; 68(5): pp. 1375–80.
5. Adriaenssens N, Verbelen H, Lievens P, Lamote J. (2012). Lymphedema of the operated and irradiated breast in breast cancer patients following breast conserving surgery and radiotherapy. Lymphology.; 45(4): pp. 154–64.
6. Adriaenssens N, Belsack D, Buyl R, et. al. (2012). Ultrasound elastography as an objective diagnostic measurement tool for lymphoedema of the treated breast in breast cancer patients following breast conserving

surgery and radiotherapy. Radiol Oncol.; 46(4): pp. 284–95.

7. Toledano A, Garaud P, Serin D, et. al. (2006). Concurrent administration of adjuvant chemotherapy and radiotherapy after breast-conserving surgery enhances late toxicities: long-term results of the ARCOSEIN multicenter randomized study. Int J Radiat Oncol Biol Phys.; 65(2): pp. 324–32.

8. Clarke D, Martinez A, Cox RS, Goffinet DR (1982). Breast edema following staging axillary node dissection in patients with breast carcinoma treated by radical radiotherapy. Cancer.; 49(11): pp. 2295–9.

9. Delay E, Gosset J, Toussoun G, Delaporte T, Delbaere M (2008). Post-treatment sequelae after breast cancer conservative surgery. Ann Chir Plast Esthet.; 53(2): pp. 135–52.

10. Pezner RD, Patterson MP, Hill LR, Desai KR, Vora N, Lipsett JA (1985). Breast edema in patients treated conservatively for stage I and II breast cancer. Int J Radiat Oncol Biol Phys.; 11(10): pp. 1765–8.

11. Wratten CR, O'brien PC, Hamilton CS, Bill D, Kilmurray J, Denham JW (2007). Breast edema in patients undergoing breast-conserving treatment for breast cancer: assessment via high frequency ultrasound. Breast J.; 13(3): pp. 266–73.

12. Poglio S, Galvani S, Bour S, André M, Prunet-Marcassus B, Pénicaud L, et. al. (2009). Adipose tissue sensitivity to radiation exposure. Am J Pathol.; 174(1): pp. 44–53.

13. Constantine C, Parhar P, Lymberis S, et. al. (2008). Feasibility of accelerated whole-breast radiation in the treatment of patients with ductal carcinoma in situ of the breast. Clin Breast Cancer.; 8(3): pp. 269–74.

14. Wenz F, Welzel G, Keller A, et. al. (2008). Early initiation of external beam radiotherapy (EBRT) may increase the risk of long-term toxicity in patients undergoing intraoperative radiotherapy (IORT) as a boost for breast cancer. Breast.; 17(6): pp. 617–22.

15. Vicini FA, Chen P, Wallace M, et. al. (2007). Interim cosmetic results and toxicity using 3D conformal external beam radiotherapy to deliver accelerated partial breast irradiation in patients with early-stage breast cancer treated with breast-conserving therapy. Int J Radiat Oncol Biol Phys.; 69(4): pp. 1124–30.

16. Mussari S, Sabino Della Sala W, Busana L, et. al. (2006). Full-dose intraoperative radiotherapy with electrons in breast cancer. First report on late toxicity and cosmetic results from a single-institution experience. Strahlenther Onkol.; 182(10): pp. 589–95.

17. Marcenaro M, Sacco S, Pentimalli S, et. al. (2004). Measures of late effects in conservative treatment of breast cancer with standard or hypofractionated radiotherapy. Tumori.; 90(6): pp. 586–91.

18. Back M, Guerrieri M, Wratten C, Steigler A (2004). Impact of radiation therapy on acute toxicity in breast conservation therapy for early breast Cancer. Clin Oncol.; 16(1): pp. 12–6.

19. Hoeller U, Tribius S, Kuhlmey A, Grader K, Fehlauer F, Alberti W (2003). Increasing the rate of late toxicity by changing the score? A comparison of RTOG/EORTC and LENT/SOMA scores. Int J Radiat Oncol Biol Phys.; 55(4): pp. 1013–8.

20. Grann A, McCormick B, Chabner ES, et. al. (2000). Prone breast radiotherapy in early-stage breast cancer: a preliminary analysis. Int J Radiat Oncol.;47(2): pp. 319–25.

Corresponding Author

P. Yashwanth Kumar*

Associate Professor, Department of Physiotherapy, Galgotias University, Greater Noida, Uttar Pradesh, India