Section: Radiation Oncology

Original Research Article

RADIOTHERAPY FOR GERIATRIC CANCER PATIENTS: THREE-YEAR SINGLE INSTITUTIONAL EXPERIENCE

N.Poonkodi[1], P.R.Vijey Karthik[2], M.Pandidurai[3]

[1]Associate Professor, Department of Radiation Oncology, Government Royapettah Hospital, Kilpauk Medical College, Chennai, Tamilnadu, India
[2]Associate Professor Department of Radiation Oncology Institute of Obstetrics and Gynecology Madras Medical College Chennai, Tamilnadu, India
[3]Assistant Professor, Department of Medical Oncology, Government Royapettah Hospital, Chennai, Tamil Nadu, India

Received : 19/10/2025
Received in revised form : 05/12/2025
Accepted : 24/12/2025

Keywords:
Aged; Radiotherapy, External-Beam; Neoplasms; Chemoradiotherapy; Treatment Outcome; Palliative Care.

Corresponding Author:
Dr. N.Poonkodi,
Email: poongs1980@gmail.com

DOI: 10.47009/jamp.2026.8.1.4

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2026; 8 (1); 18-21

ABSTRACT

Background: Older adults represent a substantial proportion of the cancer population, yet frequently face challenges in accessing standard treatments due to comorbidities and reduced physiological reserve. Radiotherapy remains a key treatment modality for patients who may not tolerate surgery or systemic therapies. This study aimed to describe the clinical characteristics, cancer profiles, radiotherapy practices, and treatment completion outcomes among elderly cancer patients treated with conventional external-beam radiotherapy (EBRT). **Materials and Methods:** A retrospective observational review was conducted at a tertiary-care centre from January 2022 to December 2024. Patients aged ≥70 years with histologically confirmed malignancies receiving EBRT were included, while those with incomplete records or previous radiotherapy to the same site were excluded. A total of 289 consecutively treated patients were analysed. The primary outcome was completion of prescribed radiotherapy. Data were extracted from case records and analysed descriptively using frequencies and percentages. **Result:** Most patients were aged 70–79 years (86%) and male (81%). Locally advanced disease at presentation was common (57%). Curative-intent radiotherapy was planned for 69% of cases, with definitive treatment forming the majority (72.4%). Concurrent chemoradiotherapy was administered in 51% of patients. Completion rates were high across treatment settings: 86.1% for definitive, 91.8% for adjuvant, 83.3% for neoadjuvant, and 93.3% for palliative radiotherapy. **Conclusion:** Radiotherapy was feasible and well-tolerated in older adults, with strong adherence to prescribed treatment courses in routine practice. Appropriate patient selection enabled curative approaches even in advanced disease.

INTRODUCTION

Cancer remains a major global health burden, and the number of cancer diagnoses continues to rise as populations age. Worldwide, the population aged ≥65 years is expected to more than double in the coming decades, with the most rapid growth among those over 80 years.[1] Population ageing is a major factor driving increased cancer incidence. In older adults (≥60 years), a large proportion of cancer cases already occur in low- and middle-income countries (LMICs), and this group is projected to expand significantly by 2040.[2] Cancer in the elderly is a major clinical concern, with about 60% of cancer cases and 70% of cancer-related deaths occurring in individuals aged ≥65 years.[3]

Older adults remain underrepresented in clinical trials, and many receive less aggressive or non-standard treatment than younger patients.[4] They frequently present with multimorbidity, reduced physiological reserve, weakness, and impaired function.[5] It increases the risk of treatment-related toxicity and make therapeutic planning more challenging.[6] Many older patients are not offered curative treatments or receive reduced therapy, even when their disease is still treatable. Radiotherapy is an important treatment option, and the external beam radiotherapy (EBRT) is non-invasive and can be delivered safely when patients are selected appropriately.[7] EBRT is used in curative treatment plans as well as for palliative symptom relief in older patients who cannot undergo major surgery or cytotoxic chemotherapy.[8]

Radiotherapy utilisation in older adults is guided by increasing recognition of geriatric-specific factors that alter treatment tolerance and outcomes.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Comprehensive geriatric assessment (CGA) has emerged as a recommended framework to evaluate frailty, cognitive function, nutrition, and social support, enabling more precise selection of radiotherapy candidates and predicting treatment-related morbidity.[9] Studies shown that integrating CGA into oncology decision-making improves treatment and reduces unplanned interruptions.[10] Such approaches are particularly relevant in LMIC settings, where heterogeneous functional status and limited supportive resources may significantly affect the radiotherapy feasibility and completion.

Despite its benefits, many elderly patients who are eligible for radiotherapy do not complete prescribed progressions, indicating differences in access and utilisation.[11] Decision-making is further complicated by the variability among older adults in comorbidity burden, frailty, cognitive function, mobility, and life expectancy.[12] Although older individuals were more in the cancer population, still the available research are limited. Data on radiotherapy patterns, disease characteristics, treatment completion, and acute toxicity in geriatric cancer patients, especially in LMIC settings and tertiary-care systems, are rare. This lack of institutional-level data describing practical radiotherapy outcomes in geriatric cancer patients treated in LMIC tertiary-care centres. Therefore, this study was conducted to describe the clinical characteristics, cancer profiles, radiotherapy practices, and treatment completion of elderly cancer patients (aged ≥70 years) who received conventional EBRT at a tertiary-care centre over three years.

MATERIALS AND METHODS

A retrospective observational study was conducted at a tertiary-care centre, including all consecutive patients aged ≥70 years treated with EBRT from January 2022 to December 2024. The Institutional Ethics Committee approval and informed consent were obtained from all patients.

Inclusion and exclusion criteria

Patients aged ≥70 years, histologically confirmed malignancy, treatment with external beam radiotherapy, and complete clinical and treatment records were included.

Age <70 years, benign or uncertain pathology, prior radiotherapy to the same site, incomplete data, or refusal and inability to undergo planned treatment were excluded. No patients were excluded due to missing clinical or treatment data.

Methods

Patients were categorised based on radiotherapy intent as definitive, adjuvant, or neoadjuvant treatment. Demographic variables (age and sex), comorbidities including diabetes, hypertension, coronary artery disease, chronic obstructive pulmonary disease, and tuberculosis, along with tumour site, disease stage, radiotherapy type, concurrent chemotherapy use, treatment completion, treatment interruptions, and acute toxicities were included for analysis. These data were retrieved from clinical case records and the departmental database.

Disease stage was classified as early when confined to the primary site, locally advanced when involving adjacent structures or regional nodes, and metastatic when spread to distant organs. Acute toxicities were documented during treatment and graded using the Common Terminology Criteria for Adverse Events (CTCAE v4.0). Eligibility for concurrent chemo radiotherapy was determined by functional status, organ function, and the presence of significant comorbidities to ensure treatment tolerance.

The primary outcome was radiotherapy treatment completion. Secondary outcomes included acute toxicity, treatment interruptions, radiotherapy intent, and stage-wise clinical distribution. Toxicities were documented prospectively during treatment reviews and graded according to CTCAE v4.0 by the treating radiation oncologist.

Data analysis: The data were analysed using IBM SPSS statistics v27, and the data were presented as frequencies and percentages.

RESULTS

A total of 289 patients met the eligibility criteria and were included in the analysis. Most patients were 70–79 years old, 249 patients (86%). Men formed the larger group 234 patients 81%). Locally advanced tumours were the most frequent at diagnosis, 164 patients (57%). Curative radiotherapy was planned in 199 patients (69%), and definitive treatment accounted for 144 of these cases (72.4%). Concurrent chemo radiotherapy was used in 147 patients (51%) [Table 1].

Table 1: Baseline clinical characteristics and treatment distribution

Parameter	Category	N (%)
Age (years)	70–79	249 (86%)
	80–89	37 (13%)
	90–99	3 (1%)
Gender	Male	234 (81%)
	Female	55 (19%)
Comorbidities	Present	82 (28.4%)
	Absent	207 (71.6%)
Stage	Early	41 (14%)
	Locally advanced	164 (57%)
	Metastatic	84 (29%)
Surgery	Resectable	65 (22.5%)

ISSN (O): 2687-5365; ISSN (P): 2753-6556

	Unresectable	224 (77.5%)
Resectable Cases	Underwent surgery	54 (83%)
	Not operated	11 (17%)
Radiotherapy Intent	Curative	199 (69%)
	Palliative	90 (31%)
Curative RT Type	Definitive	144 (72.4%)
	Adjuvant	49 (24.6%)
	Neoadjuvant	6 (3%)
Concurrent chemo radiotherapy	Yes	147 (51%)
	No	142 (49%)

Definitive radiotherapy was completed by 124 patients (86.1%). Adjuvant treatment completion was seen in 45 patients (91.8%). Neoadjuvant treatment completion occurred in 5 patients (83.3%). Palliative radiotherapy was completed by 84 patients (93.3%) [Table 2].

Table 2: Radiotherapy completion rates by treatment modality

Treatment Modality	Completion Status	N (%)
Definitive RT	Completed	124 (86.1%)
	Not completed	20 (13.9%)
Adjuvant RT	Completed	45 (91.8%)
	Not completed	4 (8.2%)
Neoadjuvant RT	Completed	5 (83.3%)
	Not completed	1 (16.7%)
Palliative RT	Completed	84 (93.3%)
	Not completed	5 (6.7%)

DISCUSSION

Older adults formed the majority of the treated population, most of them in their 70s and predominantly male. Locally advanced disease was the most common stage at presentation, suggesting delayed diagnosis or progression before referral. Curative radiotherapy was the main treatment intent, and definitive radiotherapy accounted for most of the curative cases. Concurrent chemo radiotherapy was used in selected patients with suitable functional status. Treatment completion was high across definitive, adjuvant, neoadjuvant, and palliative groups.

In this study, most patients were 70–79 years old, mainly male, and frequently presented with locally advanced disease. Curative radiotherapy was the primary treatment, with definitive therapy and concurrent chemoradiotherapy often used. Similarly, Trivedi et al. reported 289 patients aged ≥70 years receiving treatment, with a median age of 74.6 years and a male-to-female ratio of 4.25:1.10 In the registry analysis by Tinhofer et al. involving 84,046 HNSCC cases (2000–2022), elderly patients (>70 years) received definitive radiotherapy more often. Among them, platinum-based chemo radiation were used in 26%, compared with 57% in younger patients, highlighting more selective CRT use in older adults.[13] Li et al. studied 116 patients aged ≥70 years with oesophageal squamous cell carcinoma treated with definitive therapy; 56 (48.3%) received combined chemo radiotherapy, and 60 (51.7%) received radiotherapy alone.[14]

Jilani et al. examined 73 patients aged ≥65 years with locally advanced head and neck cancer (stage II–IV, median age 74); 39 (53%) received concurrent chemoradiotherapy.[15] Haehl et al. evaluated 246 patients aged ≥65 years with head and neck cancer, of whom 150 (61.0%) had T3–T4 disease and 164 (66.7%) had nodal involvement. Definitive radiotherapy was given to 166 patients (67.5%), and adjuvant radiotherapy to 80 (32.5%). Treatment completion was achieved in 213 patients (86.6%). Concomitant systemic therapy was planned for 147 patients (59.8%) and fully administered in 109 (74.1%).[16] These reports align in terms of age distribution, frequency of advanced-stage disease, use of curative radiotherapy, selective application of chemotherapy, and high completion rates.

In the present study, treatment completion was high across all radiotherapy categories, including definitive, adjuvant, neoadjuvant, and palliative schedules. Likewise, Trivedi et al. reported 144 definitive, 49 adjuvants, and 6 neoadjuvant treatments among older patients.[10] Tiwari et al. showed that elderly patients tolerated intensive RT/CRT well and were able to complete treatment despite age-related challenges.[17] These findings highlight good tolerance and high completion of planned radiotherapy among older adults, consistent with the outcomes observed. However, most available research focuses on specific tumour sites, especially head and neck cancers, limiting broader insight into geriatric oncology radiotherapy across different cancer types.

Limitations: This single-centre retrospective study relied on existing records, with missing data and heterogeneous clinical decisions. Only acute toxicity was recorded, and functional status was not assessed, limiting generalisation and evaluation of long-term outcomes.

Clinical implications: Most elderly patients can complete planned radiotherapy, supporting its use as a feasible treatment option. Careful patient selection and supportive care may further improve tolerance and access in routine clinical practice. Therefore, this

ISSN (O): 2687-5365; ISSN (P): 2753-6556

study provides radiotherapy outcomes in elderly cancer patients, helping fill the evidence gap in routine clinical practice. Prospective multicentre studies incorporating geriatric assessment tools, long-term toxicity monitoring, and quality-of-life outcomes are required to optimise selection criteria and personalise radiotherapy in older adults.

CONCLUSION

Most elderly patients presented with locally advanced disease and received curative-intent radiotherapy. Treatment completion rates were high across definitive, adjuvant, neoadjuvant, and palliative settings, showing that patients generally tolerated treatment well when appropriately selected and supported. These results indicate that radiotherapy is a feasible treatment option for older adults in routine oncology practice, including in settings with limited resources. Future studies should assess functional status, long-term clinical outcomes, involve multiple centres, and explore ways to improve treatment access for elderly patients.

REFERENCES

1. Bastiaannet E, Pilleron S. Epidemiology of cancer in older adults: a systematic review of age-related differences in solid malignancies treatment. Curr Oncol Rep 2025;27:290–311. https://doi.org/10.1007/s11912-025-01638-6.
2. Kalita M, M D, Saha I, Chakrabarti A. Global burden of cancer pattern in 2020 & prediction to 2040 among older adults. Indian J Med Res 2024;160:397–406. https://doi.org/10.25259/ijmr_1729_23.
3. Suhag V, Bs S, Vats P, Singh S, Jain M, Vashisht R. Radiotherapy and geriatric cancer patients: A single institute experience. Indian J Med Sci 2019;71:28–34. https://doi.org/10.25259/ijms_10_2019.
4. Movsas B. Radiation therapy in elderly persons: An old issue with new approaches. Int J Radiat Oncol Biol Phys 2017;98:715–7. https://doi.org/10.1016/j.ijrobp.2016.11.032.
5. Jędrzejczyk M, Foryś W, Czapla M, Uchmanowicz I. Relationship between multimorbidity and disability in elderly patients with coexisting frailty syndrome. Int J Environ Res Public Health 2022;19:3461. https://doi.org/10.3390/ijerph19063461.
6. Roller-Wirnsberger R, Thurner B, Pucher C, Lindner S, Wirnsberger GH. The clinical and therapeutic challenge of treating older patients in clinical practice. Br J Clin Pharmacol 2020;86:1904–11. https://doi.org/10.1111/bcp.14074.
7. Koka K, Verma A, Dwarakanath BS, Papineni RVL. Technological advancements in external beam radiation therapy (EBRT): An indispensable tool for cancer treatment. Cancer Manag Res 2022;14:1421–9. https://doi.org/10.2147/CMAR.S351744.
8. Neugut AI, Prigerson HG. Curative, life-extending, and palliative chemotherapy: New outcomes need new names. Oncologist 2017;22:883–5. https://doi.org/10.1634/theoncologist.2017-0041.
9. Wildiers H, Heeren P, Puts M, Topinkova E, Janssen-Heijnen MLG, Extermann M, et al. International Society of Geriatric Oncology Consensus on Geriatric Assessment in Older Patients with Cancer. J Clin Oncol. 2014;32(24):2595–603. https://doi.org/10.1200/JCO.2013.54.8347.
10. Trivedi G, Singh S, Lohia N, Harish, Som Vashisth R, Bisht N, et al. Radiotherapy for geriatric cancer patients: Five-year experience at a north Indian tertiary care hospital. Asian Pac J Canc Care 2023;8:319–25. https://doi.org/10.31557/apjcc.2023.8.2.319-325.
11. Shenoy P, Harugeri A. Elderly patients' participation in clinical trials. Perspect Clin Res 2015;6:184–9. https://doi.org/10.4103/2229-3485.167099.
12. Zhang XM, Wu XJ, Cao J, Jiao J, Chen W. Association between cognitive frailty and adverse outcomes among older adults: A meta-analysis. J Nutr Health Aging 2022;26:817–25. https://doi.org/10.1007/s12603-022-1833-5.
13. Tinhofer I, Hofmann E, Trelinska-Finger A, Saraei T, Keilholz U, Heiland M, et al. Trends and efficacy of definitive radiotherapy regimens for locally advanced head and neck cancer in elderly patients: A population-based analysis by the German cancer registry group. Eur J Cancer 2025;230:116039. https://doi.org/10.1016/j.ejca.2025.116039.
14. Li X, Zhao L-J, Liu N-B, Zhang W-C, Pang Q-S, Wang P, et al. Feasibility and efficacy of concurrent chemoradiotherapy in elderly patients with oesophageal squamous cell carcinoma: a retrospective study of 116 cases from a single institution. Asian Pac J Cancer Prev 2015;16:1463–9. https://doi.org/10.7314/apjcp.2015.16.4.1463.
15. Jilani OK, Singh P, Wernicke AG, Kutler DI, Kuhel W, Christos P, et al. Radiation therapy is well tolerated and produces excellent control rates in elderly patients with locally advanced head and neck cancers. J Geriatr Oncol 2012;3. https://doi.org/10.1016/j.jgo.2012.05.001.
16. Haehl E, Rühle A, David H, Kalckreuth T, Sprave T, Stoian R, et al. Radiotherapy for geriatric head-and-neck cancer patients: what is the value of standard treatment in the elderly? Radiat Oncol 2020;15:31. https://doi.org/10.1186/s13014-020-1481-z.
17. Tiwari V, Singh O, Ghori H, Yogi V, Peepre K, Yadav S. Treatment tolerance and response of elderly head and neck cancer patients: A single-institution retrospective study. Clin Cancer Investig J 2015;4:349-53. https://doi.org/10.4103/2278-0513.154535.

ISSN (O): 2687-5365; ISSN (P): 2753-6556