ORIGINAL RESEARCH

DOI: 10.4274/ejgg.galenos.2025.2024-9-5
Eur J Geriatr Gerontol

Treatment of and Clinical Experience with Breast Cancer in Octogenarians

Semra Salimoğlu[1], Yüksel Doğan[2], Tayfun Kaya[3], Semra Demirli[3], Gül Çolakoğlu[4]

[1]University of Health Sciences Türkiye, İzmir Training and Research Hospital, Clinic of General Surgery, İzmir, Türkiye
[2]Bartın State Hospital, Clinic of General Surgery, Bartın, Türkiye
[3]Çiğli City Hospital, Clinic of General Surgery, İzmir, Türkiye
[4]University of Health Sciences Türkiye, İzmir Training and Research Hospital, Clinic of Radyology İzmir, Türkiye

Objective: Breast cancer is one of most prevalent cancers with high survival rate. As populations age, proportion of individuals aged 80-89, known as "octogenarians", also rises. When determining treatment options for breast cancer in this age group, multiple comorbidities, especially with locally advanced tumors and dementia etc., influence choice of surgical intervention. This study aimed to identify factors affecting such treatment in elderly patients.

Materials and Methods: Data from patients ≥80 years of age, admitted between January 2016 and April 2024 and diagnosed with non-metastatic breast cancer, were retrospectively analyzed. Demographic data, laboratory and radiological tests, operative findings, postoperative pathologies, morbidity, mortality, and patient survival times were evaluated.

Results: Data from 68 patients [mean (± standard deviation) age, 82.3±2.7 years (range, 80-89 years)] were analyzed. Hypertension was observed in 59 (86.8%) patients and diabetes mellitus in 25 (36.8%), cardiovasküler diseases, respiratory conditions, cerebrovascüler events in 5 patients (<%1). Breast-conserving surgery was performed in 28 (41.2%) patients and 20 (29.4%) underwent modified radical mastectomy. Axillary node positivity was observed in 28 (41.2%) patients. Sentinel lymph node biopsy was performed in 37 patients (54.4%), and axillary dissection was performed in 25 (36.8%). Estrogen receptor positivity was observed in 63 (92.6%) patients, PR positivity in 59 (86.8%), human epidermal growth factor receptor 2 positive (HE C-erbB-2) positivity in 11 (16.2%), metastases were detected in 10 (14.7%). Hormone therapy was administered to 63 (92.6%) patients,chemotherapy to 52 (76.5%), radiotherapy to 36 (52.9%). Two (2.9%) patients had locally advanced disease, 13 (19.2%) had advanced-stage disease with metastasis, and 53 (77.9%) had early stage disease.

Conclusion: In the planning of treatment for this patient population, our clinical observations indicate a potential delay in the initiation of treatment due to cognitive comorbidities. Despite the limited number of patients included in the study, it has been demonstrated that surgical treatment can be safely performed in octogenarians diagnosed with breast cancer.

Keywords: Breast cancer, octogenarian, treatment

Address for Correspondence: Yüksel Doğan MD, Bartın State Hospital, Clinic of General Surgery, Bartın, Türkiye
E-mail: ydogan49@yahoo.com.tr **ORCID:** orcid.org/0000-0002-0000-4664
Received: 10.09.2024 **Accepted:** 14.03.2025 **Epub:** 07.07.2025

Cite this article as: Doğan Y, Salimoğlu S, Kaya T, Çolakoğlu G, Demirli S. Treatment of and clinical experience with breast cancer in octogenarians. J Geriatr Gerontol [Epub Ahead of Print].

INTRODUCTION

Breast cancer is the most common cancer among women, and its incidence increases with age. As the global population increases and ages,the proportion of elderly individuals diagnosed with breast cancer will also rise, and breast cancer in this patient population is expected to become a significant public health issue in the coming years. The global population is aging rapidly, with people over 60 projected to make up 22% of the world's population by 2050 (1), and in Türkiye, the 65+ age group will rise from 10% to over 22% by 2060 (2). Life expectancy has also grown, now averaging 73 years globally and 78 years in Türkiye, contributing to the increasing proportion of older adults (3). While an average 65-year-old patient is expected to live for >20 additional years, a 75-year-old patient is expected to live for only anadditional 12 years (4).

Although the average age at onset of breast cancer is 61 years, 45% of those diagnosed with breast cancer are ≥65 years of age. It is estimated that 12% of all breast cancer cases involve women >80 years of age. However, this age group is often excluded from clinical trials and screening programs, leading to frequent delays in diagnosis. As a result, data regarding the diagnosis and treatment for this demographicare quite limited, and this age group often encounter streatment challenges due tothe prevalence of comorbid conditions. Serious cardiovascular and cerebrovascular comorbidities have the potential to complicate general anaesthesia in surgical intervention and increase the potential toxic effect of chemotherapy, which may increase the risk of complicating treatment processes (5).

The primary aim in the management of breast cancer among patients of advanced age is to increase survival rates while minimizing undesirable side effects by pursuing effective and well-tolerated treatment options. It is crucial to ensure that these patients receive adequate and appropriate treatment without compromising quality of life (6). This study aimed to identify factors influencing the diagnosis and treatment of older adults with breast cancer and raise awareness to ensure that they receive standard treatment.

Materials and Methods

A retrospective analysis was performed using data from patients diagnosed and treated for breast cancer at the authors' hospital between January 2016 and April 2024. All procedures adhered to the ethical rules and principles of the Declaration of Helsinki, and the study was approved by the Medical Faculty Clinical Research Ethics Committee University of Health Sciences İzmir Tepecik Training and Research Hospital (approval number: 2024/03-04 date: 03.04.2024). As the study was retrospective, the ethics committee did not require patients' consent forms. Demographic data, comorbidities, tumor characteristics, surgical interventions, postoperative pathological findings, cancer stage(s), and whether the patients received chemotherapy, radiotherapy, or hormone therapy were recorded. Although severe cardiovascular and cerebrovascular conditions, were highlighted as potential treatment barriers in the introduction, the patient records lacked specific details on these comorbidities.

Statistics

Data were analyzed using SPSS version 29 (IBM Corp. Armonk, NY, USA). Descriptive statistics are expressed as the number of cases (n), percentage (%), mean ± standard deviation (SD), and minimum and maximum values.

RESULTS

The present study included data from 68 patients, of whom 66 (97.1%) were female, ranging in age between 80 and 89 years, with a mean (± SD) age of 82.3±2.7 years. Procedures were performed on the right side in 33 (48.5%) patients and on the left in 33 (48.5%). Fifty-nine (86.8%) patients had hypertension and 25 (36.8%) had diabetes mellitus cardiovasküler diseases, respiratory conditions, cerebrovasculer events in 5 patients (<%1) ,(Table 1). Twenty-eight (41.2%) patients underwent breast-conserving surgery (BCS) and 20 (29.4%) underwent modified radical mastectomy. Axillary positivity was observed in 28 (41.2%) patients. Sentinel lymph node biopsy was performed in 37 (54.4%) patients, while axillary dissection was performed in 25 (36.8%). Tumor size ranged from 0.80 to 20 cm, with a mean tumor size of 4.0±2.7 cm. Among the pathology results, 52 patients (76.5%) had invasive ductal carcinoma, 6 (8.8%) had invasive mammary carcinoma, and 4 (5.9%) had invasive lobular carcinoma. Estrogen receptor (ER) positivity was observed in 63 patients (92.6%), progesterone receptor (PR) positivity in 59 (86.8%), and HER2 positivity in 11 (16.2%). There were 39 patients (57.4%) with a Ki-67 value ≥14. Metastasis was observed in 10 (14.7%) patients. Hormone therapy was administered to 63 (92.6%) patients, chemotherapy to 52 (76.5%), and radiotherapy to 36 (52.9%). There were 27 (39.7%) patients with the luminal A molecular subtype and 36 (52.9%) with luminal B subtype. Two (2.9%) patients were in the locally advanced stage, and 13 (19.2%) were in the advanced stage, with metastasis. Fifty-three (77.9%) patients had early stage disease (Table 2). The chi-square test analysis results of the relationship between chronic diseases and chemotherapy toxicities are presented in Table 3. According to the results, no statistically significant relationship was found between hypertension, diabetes, or asthma and chemotoxicity development ($p>0.05$). However, a statistically significant relationship was identified between heart failure and chemotoxicity development ($p<0.05$). Among patients diagnosed with heart failure, 2 (40%) also developed chemotoxicity, and this association was found to be statistically significant.

Table 1. Characteristics of patients

	n	%
Age	82.3±2.7 (80-89)	
Genus		
Male	2	2.9
Woman	66	97.1
Side		
Right	33	48.5
Left	33	48.5
Bilateral breast CA	2	2.9
HT	59	86.8
DM	25	36.8
Others (Dementia, cardiovascular diseases, respiratory conditions, cerebrovascular events) operation	5	<1
MKC	28	41.2
MRM	20	29.4
Simple mastectomy	13	19.1
BX only	7	10.3
Axilla		
Positive	28	41.2
Negative	40	58.8
SLNB		
Done	37	54.4
Not done	31	45.6
Axillary dissection		
Done	25	36.8
Not done	43	63.2
Size of CA	4.0±2.7 (0.80-20.0)	
Pathology		
Invasive ductal carcinoma	52	76.5
Invasive ductal carcinoma + ductal caesinoma insitu	2	2.9
Invasive lobular carcinoma	4	5.9
Invasive breast carcinoma	6	8.8
Invasive solid papillary carcinoma	1	1.5
Invasive breast carcinoma with mixed type ductal and lobular features	1	1.5
Papillary carcinoma	1	1.5
Papillary neoplasia, left breast	1	1.5

Numerical variables are summarized as mean ± standard deviation, (minimum-maximum).
n: Number of patients, %: Percentage value, CA: Carcinoma, HT: Hormone therapy, DM: Distant metastasis, MKC: Mikrokalsifikasyon, MRM: Modified radical mastectomy, BX: Biopsy, SLNB: Sentinel lymph node biopsy

Discussion

Breast cancer among women ≥80 years of age exhibits similar characteristics to those encounteredin postmenopausal breast cancer, biologically known. However, due to lower screening rates in this age group, breast cancer diagnosis may occur at more advanced stages. Personalized treatments that take into account the individual's general condition, comorbidities, and life expectancy remain a crucial factor in improving both the quality and duration of life. Comprehensive geriatric assessment is an important part of the care of older adults with cancer and it is also important for side effects, complications that may develop during cancer treatment. The health status of elderly patients should be assessed using validated comprehensive geriatric assessment tools to better predict prognosis and treatment-related risks, thereby ensuring more careful treatment decisions. Frailty and its associated challenges in treatment planning are important considerations, as identifying an approach that balances patient quality of life

Tablo 2. Postop tretment and pathologic findings		
	n	%
ER		
Negative	5	7.4
Positive	63	92.6
PR		
Negative	9	13.2
Positive	59	86.8
C-erbB-2		
Negative	57	83.8
Positive	11	16.2
Ki-67		
<14	29	42.6
≤14	39	57.4
Metastasis		
There is	10	14.7
None	58	85.3
Hormone therapy		
+	63	92.6
-	5	7.4
Chemotherapy		
+	52	76.5
-	16	23.5
Radiotherapy		
+	36	52.9
-	32	47.1
Molecular subtype		
Basal-Like	1	1.5
HER2 (+)	4	5.9
Luminal A	27	39.7
Luminal B	36	52.9
PHASE		
Early stage	53	77.9
Locally advanced stage	2	2.9
Advanced stage + metastatic	13	19.2

n: Number of patients, %: Percentage value, ER: Estrogen receptor, PR: Progesterone receptor, C-erbB-2: Human epidermal growth factor receptor 2, Ki-67: Proliferation marker, HER2: Human epidermal growth factor receptor 2

can be particularly challenging for surgeons and oncologists despite often leading to gratifying outcomes for many patients today (7,8).

Efforts should be made to ensure that patients and their family members understand the treatment options, potential side effects of treatment, and the impact of outcomes on quality of to rapid advancements in the field of medicine, human life expectancy is increasing, leading to a rise in the number of malignancies in the elderly recently, elderly patients with breast cancer were not adequately represented in clinical trials; however, more specific research focusing on both localized and metastatic breast cancer in elderly women has been conducted (9).

When deciding on the treatment for breast cancer patients >80 years of age, age alone should not be a prohibitive factor for physicians. Many healthy patients >80 years of age can tolerate traditional treatment and achieve average life expectancy for their age group. After considering all comorbidities, if comprehensive geriatric assessment allows for surgical treatment, it should be implemented. In cases in which early stage cancer is detected,the standard procedure should consist of lumpectomy and radiation therapy. However, in elderly patients with hormone receptor-positive disease, surgery may not be feasible due to comorbidities. Therefore, endocrine therapy is not only an essential treatment option but also the only available method for patients with low performance status who are not suitable for surgery.Nearly 85% of breast cancer cases in women >80 years of age are hormone receptor-positive. In the present study, the rate was 92.6%. Currently, thereare no data regarding the use of chemotherapy in these patients. Many doctors prefer not to use chemotherapy for these patients due to its high toxicity rates. However, the benefits of chemotherapy should not be overlooked in suitable patients, such as those with ER-negative, poorly differentiated, or metastatic tumors (10). The absence of comprehensive follow-up data, due to patients receiving chemotherapy at different centers, limited our ability to assess the relationship between chronic diseases and chemotherapy side-effects.

Elderly women constitute a significant proportion of patients affected by breast cancer. However, treatment decisions for this patient population are complex due to the presence of comorbidities, limited life expectancy, decreased tolerability to treatment, and limited participation in clinical trials. However, with the emergence of new diagnostic and treatment models, life expectancy has also increased. Therefore, considering that their numbers are expected to increase over the years, more attention should be de voted to this age group, and more scientific research is needed. With an aging population, the burden of breast cancer care will continue to increase. Improved survival rates and management of comorbidities mean that older adults diagnosed with cancer can expect longer survival (11,12).

Understanding tumor characteristics and comprehensive evaluation of the physical condition of elderly patients with breast cancer are crucial for the careful selection of treatment options. The treatment of this patient group can often become complicated due to various chronic diseases such as uncontrolled diabetes, hypertension, congestive heart failure, and chronic obstructive pulmonary disease. In cases with multiple comorbidities or high diseaseseverity, less aggressive treatment

Table 3. Chi-square analysis results of the relationship between chronic diseases and chemotoxicity development

		Chemotoxicity development				$\chi 2$	p
		Yes		No			
		n	%	n	%		
Hypertension	Yes	3	60	54	85.7	0.133	0.181
	No	2	40	9	14.3		
Diabetes	Yes	1	25	23	42.5	0.457	0.417
	No	4	75	40	57.5		
Asthma	Yes	1	25	-	-	0.100	0.074
	No	4	75	63	100		
Heart failure	Yes	2	40	-	-	0.120	0.004
	No	3	60	63	100		

χ^2 : Chi-square test, $p<0.05$.

options may be preferred. However, in patients with or without well-controlled comorbidities, treatment options applicable to younger and postmenopausal patients can be considered. As most elderly breast cancer patients are hormone receptor-positive, treatments such as hormone therapy should be tailored not to the patient's biological age but to their physiological age, to prevent over- or under -treatment, considering factors such as surgery, radiotherapy, and chemotherapy (13).

Even at an advanced age, considering the advantages of morbidity and mortality, standard surgery should be recommended becauseof the low postoperative complication rates in patients with suitable overall conditions. For women ≥80 years of age with stage 1-2 early-stage breast cancer, standard surgical treatment has yielded better outcomes specific to breast cancer compared with non-surgical treatment. We can also include stage 3 patients in the group we recommend surgery. In some cases, even in stage 4, surgery, or at least simple mastectomy, can be recommended for local control. Factors that can influence the physician's choice of treatment include age, comorbidities, mental function, and tumor characteristics. This applies not only to BCS, which is less frequently recommended for elderly patients, but also to more aggressive interventions, for which patients are increasingly opting.Patients >80 years of ageare often diagnosed with advanced-stage or larger primary tumors; therefore, they can be treated with mastectomy or no surgery. However, this trend has begun to reverse (14). In our study, 53 of 68 patients (77.9%) were diagnosed in the early stage, and 28 underwent BCS. Whether BCS is appropriate for this population can be decided after adequate preoperative evaluation, and the type of surgery should be a joint decision between the oncologist and the patient after due diligence. Chronological age alone is not sufficient for treatment selection, and standardized treatments for younger patients should also be offered to elderly patients deemed suitable to tolerate them. However, if the likelihood of death from other causes is high, aggressive treatment can be avoided (15,16). In our study, surgery was performed in 61 of 68 patients. BCS was performed in 28 (41.2%) patients, modified radical mastectomy in 20 (29.4%), and simple mastectomy in 13 (19.1%). Biopsy alone was performed in 7 patients.

The molecular characteristics of breast cancer in patients ≥80 years of age are similar to those in younger age groups. Therefore, the evaluation of the prognosis and therapeutic management in elderly patients should be personalized, rather than following general rules, considering the biology of the disease. Although there may be insufficient data regarding the use of chemotherapy in this patient population, chemotherapy should not be disregarded solely because of age. Chemotherapy may be beneficial for healthy elderly patients ≥80 years of age; however, caution should be exercised due to the higher incidence of chemotherapy-related toxicities. Typically, cardiac toxicity, arterial thromboembolic events, and worsening cognitive function increase with age. In our study, the presence of hypertension in 59 patients (86.8%), diabetes mellitus in 26 patients (36.8%) and cardiovascular diseases, respiratory disorders, cerebrovascular events in 5 patients (<1%) may be associated with chemotherapy-related toxity findings. Among patients diagnosed with heart failure, 2 (40%) also developed chemotoxicity, and this association was found to be statistically significant. In our study 8 of the 16 patients who did not receive chemotherapy, severe cardiovascular disease (congestive heart failure, heart attack, arrhythmia) was present at the time of chemotherapy planning. The remaining 8 patients had extensive metastatic disease, chronic renal failure, bilateral carotid artery occlusion, cerebrovascular disease, acute renal failure, etc. and treatment could not be planned. Adjuvant endocrine therapy should be considered in postmenopausal women with stage breast cancer, usually after surgery or radiation therapy. Therefore, the adverse effects of endocrine therapy should be carefully evaluated. Arthralgia, osteoporosis, and vaginal dryness are the common side effects of these agents. However, vaginal bleeding or discharge, "hot flashes", and thrombosis

are more common when tamoxifen is administered. Treatment-related side effects can significantly affect patient quality of life. Poorly managed treatment can lead to discontinuation and, consequently, worse outcomes (7,17).

Invasive breast cancers lacking estrogen and PRs and also devoid of overexpression of HER2 protein are commonly referred to as "triple-negative" breast cancer, which accounts for approximately 10% of all invasive breast cancer casesamongelderly women (this proportion was 1.4% in the present study). These patients are at a high risk for local recurrence, disease progression, and breast cancer-related mortality. Triple-negative breast cancer poses a therapeutic challenge, especially in frail, elderly women, as opposed to hormone receptor-positive breast cancer, for which equivalent alternative systemic treatment options are not available (18).

The importance of comorbid diseases increases as their number increases and as mental or physical function(s) decline. A decline in mental and physical function can lead to delays in diagnosis, especially in this age group. In our study, there were 2 patients in the locally advanced stage and 13 in the advanced stage with metastasis. Seven of these patients had neurological diseases (including dementia), all of whom had stage 4 disease. Efforts should be made to ensure that patients and their family members understand the treatment options, potential side effects of treatment, and the impact of outcomes on quality of life. Family members, especially those with neurological diseases, such as dementia play important roles in the diagnostic stage and should be more cautious in this regard (19).A comprehensive geriatric assessment should be performed, and an appropriate treatment plan should be determined based on this assessment (20).

The occurrence of breast cancer in women >80 years of age should not be underestimated. Because national cancer screening programs do not typically cover this age group, diagnosis in this age group relies more on clinical observations than screening. There is no significant difference in the biology of breast cancer betweenpre- and postmenopausal women and younger women (5). To prevent delays in diagnosis, increasing awareness of breast cancer in the elderly population, especially among relatives of patients with neurological diseases, such as cerebrovascular diseases, dementia, is crucial. Treatment in patients ≥80 years of age should be tailored according to their physiological age and the presence of comorbidities, and age alone should not limit the treatment options. A detailed comprehensive geriatric assessment should be performed and an appropriate treatment plan determined based on this assessment (20).

Study Limitations

The study's retrospective design, limited number of patients, and lack of detailed examination of some clinical parameters are shortcomings. Rendering the results more reliable and generalisable requires addressing these issues.

Conclusion

Breast cancer in women over the age of 80 is often underdiagnosed due to their exclusion from national screening programs, with they relying instead on clinical observations. Despite having tumor biology similar to that of younger women, comorbidities such as cardiovascular, respiratory, and cerebrovascular diseases, as well as dementia, frequently lead to delays in diagnosis and treatment. Although our study is limited by a small sample size, our findings demonstrate that surgical treatment can be safely performed in octogenarian patients with breast cancer.

Ethics

Ethics Committee Approval: All procedures adhered to the ethical rules and principles of the Declaration of Helsinki, and the study was approved by the Medical Faculty Clinical Research Ethics Committee University of Health Sciences İzmir Tepecik Training and Research Hospital (approval number: 2024/03-04 date: 03.04.2024).

Informed Consent: As the study was retrospective, the ethics committee did not require patients' consent forms.

Footnotes

Authorship Contributions

Surgical and Medical Practices: S.S., Y.D., S.D., G.Ç., Concept: S.S., Y.D., T.K., G.Ç., Design: Y.D., T.K., S.D., G.Ç., Data Collection or Processing: S.S., Y.D., T.K., S.D., Analysis or Interpretation: S.S., Y.D., T.K., S.D., G.Ç., Literature Search: S.S., Y.D., G.Ç., Writing: Y.D., T.K., S.D., G.Ç.v

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. United Nations Population Fund (UNFPA). Ageing. Published 2024. Last accessed date: 08.11.2024.
2. World Health Organization (WHO). Ageing and health. Updated October 1, 2024. Last accessed date: 08.11.2024.
3. United Nations Economic Commission for Europe (UNECE). Turkey's ageing report: demographic trends and policy response. Published 2023. Last accessed date: 08.11.2024.
4. Tang Z, Ji Y, Min Y, et al. Prognostic factors and models for elderly (≥70 years old) primary operable triple-negative breast cancer: analysis from the National Cancer Database. Front Endocrinol (Lausanne). 2022;13:856268.
5. Wyld L, Reed MWR, Morgan J, et al. Bridging the age gap in breast cancer. Impacts of omission of breast cancer surgery in older women with oestrogen receptor positive early breast cancer. A risk stratified analysis of survival outcomes and quality of life. Eur J Cancer. 2021;142:48-62.

6. Risner V, Jordan S. Mucinous carcinoma in an octogenarian: treatment and management of breast cancer in the elderly. Radiol Case Rep. 2021;16:3201-3207.
7. Depboylu B. Treatment and patient related quality of life issues in elderly and very elderly breast cancer patients. Transl Cancer Res. 2020;9:S146-S153.
8. Bertolo A, Rosso C, Voutsadakis IA. Breast cancer in patients 80 years-old and older. Eur J Breast Health. 2020;16:208-212.
9. Morgan JL, George J, Holmes G, et al. Breast cancer surgery in older women: outcomes of the Bridging Age Gap in Breast Cancer study. Br J Surg. 2020;107:1468-1479.
10. Marinopoulos S, Maniatis D, Papachatzopoulou E, et al. Breast cancer in the elderly: time for tailored treatment. Eur J Surg Oncol. 2023;49:e89.
11. Nayyar A, Strassle PD, Iles K, et al. Survival outcomes of early-stage hormone receptor-positive breast cancer in elderly women. Ann Surg Oncol. 2020;27:4853-4860.
12. Harrison CA, Parks RM, Cheung KL. The impact of breast cancer surgery on functional status in older women-a systematic review of the literature. Eur J Surg Oncol. 2021;47:1891-1899.
13. Marinopoulos S, Dimitrakakis C, Kalampalikis A, et al. Adjuvant treatment of elderly breast cancer patients: offer the best chances of cure. Breast Care (Basel). 2022;17:71-80.
14. Sawaki M, Shimomura A, Shien T, et al. Management of breast cancer in older patients. Jpn J Clin Oncol. 2022;52:682-689.
15. Peng Y, Hu T, Cheng L, et al. Evaluating and balancing the risk of breast cancer-specific death and other cause-specific death in elderly breast cancer patients. Front Oncol. 2021;11:578880.
16. Lorentzen EH, Minami CA. Avoiding locoregional overtreatment in older adults with early-stage breast cancer. Clin Breast Cancer. 2024;24:319-327.
17. Hudała-Klecha J, Zając P, Siedlaczek A, et al. Is the biology of breast cancer different in patients ≥80 years old? Oncol Clin Pract. 2023;19:244-249.
18. Jauhari Y, Gannon MR, Dodwell D, et al. Surgical decisions in older women with early breast cancer: patient and disease factors. Br J Surg. 2021;108:160-167.
19. Schonberg MA, Silliman RA, McCarthy EP, et al. Factors noted to affect breast cancer treatment decisions of women aged 80 and older. J Am Geriatr Soc. 2012;60:538-544.
20. Canhoroz M, Kanat Ö, Evrensel T. Octogenarians: Looking closer to a new group of cancer patients. Turk J Geriatr. 2013;16(1):117-118. Available from: http://hdl.handle.net/11452/32610