

Distributions of Breast Cancer Primary Tumor Locations in Indonesian Patients

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Abstract

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Introduction: Overseas studies have shown various distributions of breast cancer primary tumor locations based on stages and histopathologic types. Based on them, breast cancer was consistently reported to be found on the left breast more than the right. Breast cancer laterality was estimated to be one of the determinant factors in prognosis. In Indonesia, there are only a few studies on the laterality of breast cancer, as well as the characteristics that accompany it. The aim of this study is to know the distributions of primary breast cancer tumor locations in Indonesian patients.

Material and Methods: A cross-sectional design study was done and the data was collected from Siloam Hospital Lippo Village radiology and pathology anatomy department within the 2014-2018 period. The results were presented using descriptive statistics.

Results: A total of 74 breast cancer patients from various ages and stages were enrolled in this study. Based on the histopathological types, 84.2% patients left breast tumors and 72.2% patients with right breast tumors had invasive ductal carcinoma of no special type. Based on quadrants, 50% tumors on the left breast are in the superolateral quadrant, followed by 31.6% in superomedial, 13.2% in inferomedial, and the rest in inferolateral. Conclusion: Most tumors are located in the superolateral quadrant and the most histopathological types are non-specific invasive carcinomas.

Introduction

Overseas studies have shown various distributions of breast cancer primary tumor locations based on stages and histopathologic types. Based on them, breast cancer was consistently reported to be found on the left breast more than the right. Superolateral quadrant has the most dense tissue because of the fibroglandular and adipose, which then became the most frequent site for the primary tumor occurrence. Breast tumors in older patients have the tendency to occur in the left breast, whereupon the radiotherapy treatment will greatly affect the cardiovascular system and mortality.

Breast cancer laterality was estimated to be one of the determinant factors in prognosis. In Indonesia, there are only a few studies on the laterality of breast cancer, as well as the characteristics that accompany it. The aim of this study is to know the distributions of primary breast cancer tumor locations in Indonesian patients.

Material And Methods

A cross-sectional design study was done and the data was collected from Siloam Hospital Lippo Village radiology and pathology anatomy department within

the 2014-2018 period. Breast cancer patients included have done biopsy evaluated by a pathology anatomist and breast cancer primary tumor locations were gathered from imaging results using chest X-Ray and mammography from the radiologist. The inclusion criteria are female sex diagnosed with breast cancer between 2014 -2018, unilateral breast cancer with documented primary site and exclusive laterally, had done pathology & imaging test. The exclusion criteria is incomplete data. Staging of breast cancer based on American Joint Committee on Cancer 7th edition (late stages are III and IV). The exclusion criteria are bilateral tumor locations, history of recurrence, history of tumor therapy, history of any breast tumor surgery and no result of biopsy. The results were presented using descriptive statistics.

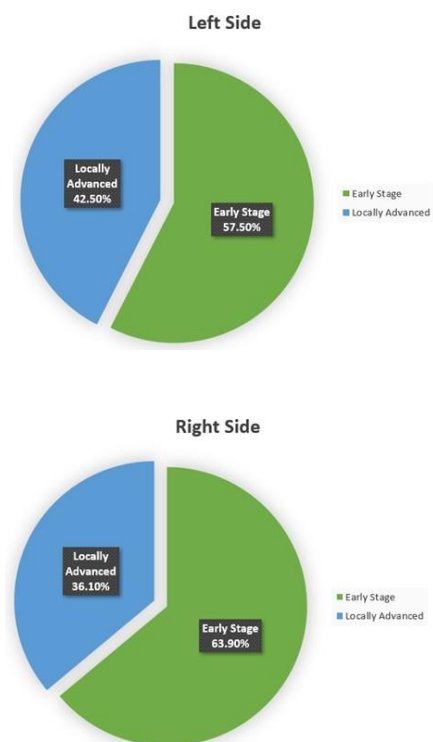
Result

A total of 74 breast cancer patients from various ages and stages were enrolled in this study. There were 51.35% patients which tumors were on the left side with the mean age of 49.45 (SD=11.19) (29-78) years old and 48.65% patients had tumor on the right side with the mean age of 48.44 (SD=9.82) (25-74) years old. Based on stages, 57.5% of patients whose tumors were on the left side and 63.9% on the right breast were in the early stage. The rest were locally advanced. Based on the histopathological types, 84.2% patients left breast tumors and 72.2% patients with right breast tumors had invasive carcinoma of no special type. Furthermore, 10.5% patients with tumors on the left breast and 13.9% on the right breast had mixed type. The least one, 8.3% patients with tumors on the right breast were classified as invasive lobular carcinoma. The rests were ductal carcinoma in situ. 50% tumors on the left breast are in the superolateral quadrant, followed by 31.6% in superomedial, 13.2% in inferomedial, and the rests in inferolateral. On the right breast, 61.1% tumors were in the superolateral quadrant, followed by 16.7% in inferolateral, 13.9% in superomedial, and the rest in inferomedial.

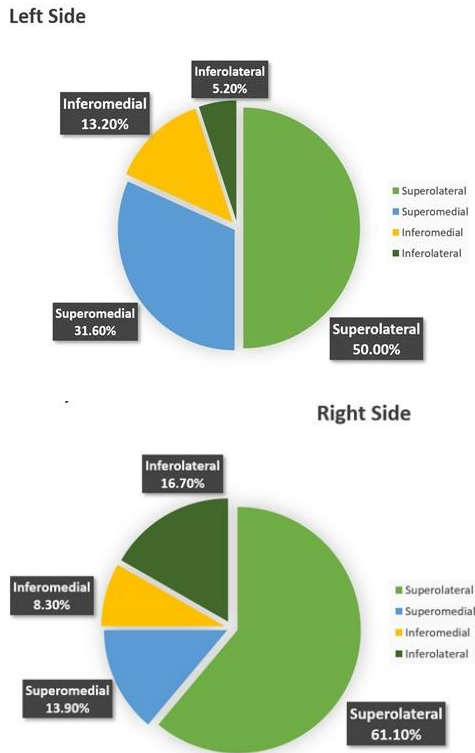
Table 1. Clinicopathologic Characteristics of Breast Cancer Patients

Characteristic		Total	Location				P Value
			Left BCs		Right BCs		
			N	%	N	%	
Histology		74	38	51,35	36	48,65	0,29
	DCIS	7	2	5,3	5	13,9	
	IDC NST	58	32	84,2	26	72,2	
	ILC	0	0	0	0	0	
Quadrant	Mix	9	4	10,5	5	13,9	0,136
	Superolateral	41	19	50,0	22	61,10	
	Inferolateral	8	2	5,20	6	16,70	
	Inferomedial	8	5	13,20	3	8,30	
Stage	Superomedial	17	12	31,6	5	13,9	0,766
	Early (I - II)	45	22	57,50	23	63,90	
	LABC (III - IV)	29	16	42,50	13	36,10	

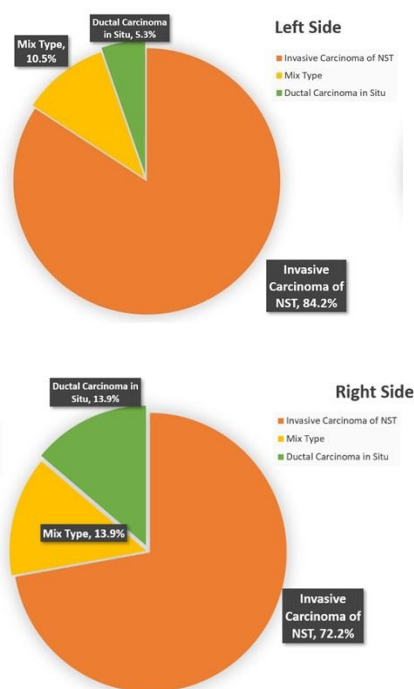
BC: breast cancer, DCIS: ductal carcinoma in situ, IDC NST: invasive ductal carcinoma of no special type, ILC: invasive lobular carcinoma, LABC: locally advanced breast carcinoma.



Pie Chart 1. Breast tumor location and stages



Pie Chart 2. Breast tumor location and quadrant of primary tumor location



Pie Chart 3. Breast tumor location and histopathology types

Discussion

This study shows that there are variations in the distribution of primary breast cancer tumor locations in Indonesian patients. Based on age, there were 51.35% of patients had tumors on the left side with a mean age of 49.45 (SD = 11.19) (29-78) years and 48.65% of patients had tumors on the right side with mean age 48.44 (SD = 9.82) (25-74) years.

In various other studies, breast cancer was noted to consistently have a tendency to occur on the left breast compared to the right breast. Because the left breast size is slightly larger than the right breast due to hemodynamic asymmetry, initially breast size was thought to be a factor in the laterality of left breast cancer. However, it was later found that the minimal increase in size did not explain the magnitude of the increased risk of left breast cancer compared to the right breast, which in turn found no association between breast size and breast cancer risk. Thus, breast parenchymal mass, or mammary gland cell mass, is more likely to be a predictor of breast cancer risk than breast size.¹

Laterality of breast cancer is thought to be one of the determinants of breast cancer prognosis. In this study, the highest number of tumors was found in the left breast (51.35%) compared to the right breast (48.65%). These results are in line with studies carried out in America and Cairo, which also described that the diagnosis of left breast tumor was a generally consistent finding regardless of age, race, ethnicity, sex, stage and histological category, although differences in the number were affected by race and ethnicity.^{1,2}

From the results of the study, it was found that the most breast tumors were in the superolateral quadrant, 50% in the left breast and 61.1% in the right breast. This result is in line with the results of other studies in China and America, which said superolateral quadrant of the breast is the most common location for occurrence of tumors.^{2,3} The superolateral quadrant has the densest tissue due to the presence of fibrogland and adipose tissue,

which are then the most common sites for primary tumors.⁴

Based on the histopathological type, 84.2% of left breast tumor patients and 72.2% of right breast tumor patients had invasive ductal carcinoma of no special type. This is in line with studies in America, that found invasive ductal carcinoma of no special type which accounted for 71% of invasive cancers, were more likely to be diagnosed in the left breast cancer than the right.² However, in some studies it is explained that left breast cancer can have non-invasive or invasive histological categories.¹

The limitation of this study is small numbers of patients who participated, further studies are needed with a larger number of patients with a longer data collection period in order to minimize the possibility of bias and increase the variety of information that can be found.

Increased alertness is expected as the impact from this study, regarding the mass of breast tumors for health workers, especially the general practitioner as the first line in screening and the discovery of cases in the periphery community with low education in the Indonesian people. General practitioner is expected to put precautions more on tumor mass, especially on the the superolateral quadrant of the left breast, can be aware of the location of the primary tumor.

For the oncology and radiology department, it is expected that the results of this study can be a source of information on choosing the right consideration of chemotherapy in the case of breast cancer located on the left. Since it was found that the risk of high dose radiation has side effects on the exposure to the left side heart radiation.

Further suggestions for the next studies needed are the relationship between breast cancer and factors such as trauma, lactation dysfunction in the left breast and breastfeeding patterns, because the minimum information and the possibility influencing the laterality of breast cancer.¹ Furthermore, Indonesia consists of various ethnic groups, races and local cultures. In this study, the data collection is only from 1 hospital in Tangerang, data collection from every region in Indonesia might generate more representative data for the people of Indonesia.

Conclusion

Patients with tumors located on the left breast are more numerous than those on the right. Patients with early stage have more tumor in the right breast meanwhile, patients with advanced stage have more tumor in the left breast. The most tumors were located in the superolateral and the most histopathologic type is invasive carcinoma of no special type.

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