

Quality of Breast Cancer Surgical Pathology Reports

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Abstract

Background: Surgical pathology reporting of breast cancer is needed for appropriate staging and treatment decisions. We here checked the quality of surgical pathology reports of breast cancer from different laboratories of Karachi, Pakistan. **Methods:** One hundred surgical pathology reports from ten different laboratories of Karachi were assessed for documentation of elements against a checklist adopted from the CAP guideline over a period of six months from January, 2017 to June, 2017 in the Oncology Department, Jinnah Postgraduate Medical Centre, Karachi. **Results:** Out of 100 reports, clinical information was documented in 68%, type of procedure and lymph node sampling in 84% and 34% respectively. Specimen laterality was mentioned in 90%, tumor site in 44%, tumor size in 92%, focality in 40%, histological type in 96%, grade in 87%, LCIS in 19%, DCIS in 83%, size of DCIS in 19%, architectural pattern in 26%, nuclear grade in 17%, necrosis in 14%, excision margin status in 91%, invasive component in 83%, DCIS in 16%, lymph node status in 91% with positive nodes in 56%, size of macro met in 54%, extranodal involvement in 48%, lymph vascular invasion in 86%, treatment effects in 31%, and pathology reporting with TNM in 57%. **Conclusion:** This study shows that the quality of surgical pathology reports for breast cancer in Karachi is not satisfactory. Therefore, there is great need to create awareness among histopathologists regarding the importance of accurate breast cancer surgical pathology reporting and to introduce a standardized checklist according to international guidelines for better treatment planning.

Keywords: Quality- breast cancer-surgical- pathology- reports

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Introduction

Breast cancer is the second leading cause of cancer deaths in women all over the world after lung cancer. In a study on tumor registry conducted at Armed Forces Institute of Pathology, Rawalpindi from 1992-2001, female breast cancer represents 26.0% of all cancers (Jamal et al., 2006). From Karachi, two studies shows breast cancer prevalence of 22.95% and 20.8% among all cancers (Bhurgri Y, 2000; Naila Zahir, 2000). The annual age standardized incidence rate in 2012 at global level was 43.3/100,000 females and 50.3/100,000 females in Pakistan.(Rehan Sarwar, 2017) In the Surveillance, Epidemiology and End Results program 2017; female breast cancer represents 15.0% among all new cases of cancer in the United States (U.S). The estimated new cases of breast cancer in female will be 252,710 and estimated deaths from disease will be 40,610 in the United States in 2017 (Siegel RL, 2017). The most frequent age of diagnosis of female breast cancer is 55-64 years; with median age of diagnosis is 62 years in U.S. The age standardized incidence rate by race/ethnicity per 100,000 women is 124.9 for all races, 127.7 for White, and 125.1 for Black, 98.5 for Asian/Pacific Islander, 93.1 for Hispanic and 82.2 for American Indian / Alaska

native.(National Cancer Institute, 2017). In a study from Lahore Pakistan, median age at diagnosis of female breast cancer was 48.6±12.2 years (Badar et al., 2015). Female breast cancer diagnosed at local stage is 61.8%. The five year survival rate of female breast cancer with localized disease is 98.9% and with distant metastasis is 26.9% (National Cancer Institute, 2017).

A multidisciplinary team is required for breast cancer management, started with radiologist, then breast surgeon, histopathologist and finally with medical and radiation oncologist. This team work has great impact on patient's outcome. Patient with breast cancer is initially assessed by radiologist followed by breast surgeon. Then final diagnosis and stage of disease is achieved with the help of histopathologist. Therefore, there should be good communication between breast surgeon and histopathologist to provide an accurate and complete breast cancer surgical pathology report. Surgical pathology report of breast cancer contains important information provided by histopathologist, that is critical to treating oncologist and helps in making stage of disease, estimating prognosis, planning further treatment strategy and predicting outcome and therefore helping in patient's care. Quality of Surgical pathology report is evaluated by accuracy and completeness of report.

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In Pakistan, there are many small private laboratories and large institutional laboratories, where histopathology of breast cancer is done. These breast cancer surgical pathology reports have many missing elements, probably due to miscommunication between breast surgeon and histopathologist or no standardized protocol followed by laboratory (Mamoon et al., 2010). It is important for a clinical laboratory to maintain standards and enhance its quality with international levels. This can be done by taking right labeled sample from breast surgeon, rightly handled and accurate reporting by histopathologist. Surgical pathology report has vital role in making patient's management decisions and should be properly interpreted by oncologist (Adyanthaya and Jose, 2013). A clinical laboratory should be economical and efficient to give proper reporting that helps in diagnosis and maintaining its quality (Naz and Saddar-ud-din, 2006). Quality of a clinical laboratory is maintained by meeting expectations of a physician and providing surgical pathology reports that satisfy physician (Nakhleh, 2006).

In Pakistan, none of local guideline had developed yet. But many international guidelines had developed (College of American Pathologists, Royal College of Pathologists UK, and Royal College of Pathologists Australia etc) for documentation of elements of surgical pathology report of breast cancer. Although, only one laboratory in Pakistan is CAP accredited but majority of laboratories which we had included are following CAP guideline. Therefore, we assessed quality of surgical pathology reports of breast cancer of ten different laboratories of Karachi, Pakistan for documentation of elements against CAP guidelines. This study will help laboratories and histopathologists to improve surgical pathology reporting of breast cancer that will help in making treatment decisions and thus improve patient's care.

Materials and Methods

We assessed the surgical pathology reports of patients with breast cancer presenting to outpatient department of Clinical Oncology, Jinnah Postgraduate Medical Centre, Karachi, Pakistan. Total one hundred surgical pathology reports of breast cancer were reviewed from ten different laboratories of Karachi with ten reports from each laboratory. This study was done over the period of six months from January, 2017 to June, 2017. This was a descriptive cross sectional study. The study sample included surgical pathology reports of mastectomy (simple and modified radical mastectomy) and breast conserving surgery (lumpectomy/excision biopsy). Core needle biopsy reports and Fine needle aspiration biopsy reports were excluded. Each report was checked against a checklist (proforma) adopted from CAP guidelines for documentation of all elements of surgical pathology report of breast cancer. Institutional Ethical Review Committee approval was taken before starting study.

Quality of surgical pathology report of breast cancer was defined as the percentage/number of reports which document the all elements of checklist adopted from CAP guidelines entitled "Protocol applies to all invasive

carcinomas of breast, including ductal carcinoma in situ (DCIS) with micro invasion" based on AJCC/UICC TNM 7th edition, Dec, 2013. The elements for breast cancer "Complete Excision (Less than total mastectomy, including specimens designated biopsy, lumpectomy, quadrantectomy, and partial mastectomy with or without axillary contents) and Mastectomy (total, with or without axillary contents; modified radical; radical) CAP guideline are shown in Table 1. Each item on each report checked for Present, Absent, and Not documented. ER/PR/Her2neu status was not checked because all laboratories check these markers on special request. We checked in the list for whether clinical information documented or not, type of procedure and type of lymph node sampling mentioned or not, specimen laterality documented or not. In macroscopic examination, we checked for documentation of size and site (quadrant) of tumor and lymph node status (lymph node recovered or not). While in microscopic examination, we checked for documentation of histologic type, histologic grade, DCIS (if present then checked for documentation of size, architectural pattern, nuclear grade and necrosis), LCIS, lymph vascular invasion, resection margin status of invasive as well in situ component, number of lymph nodes involved (if yes then size of macromets and extranodal involvement), Treatment effects, pathologic staging, TNM, and TNM descriptor. Frequencies and Percentages were calculated for presence of all elements in different reports by using SPSS 17.0.

Subgroup analysis was done on laboratories by grouping them as academic versus non academic by using chi-square test for documentation of all elements. P-value <0.05 was considered as significant. Table 2.

Results

We reviewed one hundred surgical pathology reports of breast cancer patients reported by ten different laboratories of Karachi, Pakistan. Majority of laboratories were private hospital affiliated. Some laboratories were not associated with any hospital setups. None of laboratory has performance level of 100% in breast cancer surgical pathology reporting against checklist. Out of one hundred reports from ten different laboratories, 2% reports have documentation of 26/27 elements. Clinical Information was documented in 68% reports, while type of procedure and type of lymph node sampling was documented in 84% and 34% of reports respectively. Specimen laterality was documented in 90% reports. While tumor site and size were documented 44% and 92% of reports respectively. Tumor focality was mentioned in 40% reports from which 2% reports have no focus of invasion present. Histologic type of tumor was documented in 96% reports and histologic grade in 87% reports. LCIS was mentioned in 19% reports while DCIS was documented in 83% reports with presence in 37% reports. Size of DCIS was mentioned in 19%, architectural pattern in 26%, nuclear grade in 17% and necrosis in 14% of reports. Macroscopic and microscopic extent of tumor was mentioned in 84%, while present in 69%. Excision margins were stated in 91% reports. Resection margin status of invasive component was documented in 83% reports and of DCIS

Table 1. Checklist Adopted from CAP Guidelines for Documentation of Elements in Surgical Pathology Report of Breast Cancer

Procedure
Type of lymph node sampling
Clinical information
Specimen laterality
Tumor site
Tumor size
Histologic type
Histologic grade
Tumor focality
DCIS*
a) Size
b) Architectural pattern
c) Nuclear grade
d) Necrosis
LCIS*
Macroscopic and microscopic extent of tumor
Margins
a) Invasive
b) DCIS
Lymph nodes
a) Size of macromet
b) Extranodal involvement
Treatment effects
Lymph vascular invasion
Pathological staging
TNM*
TNM descriptor

*DCIS, ductal carcinoma in situ; LCIS, lobular carcinoma in situ; TNM, tumor node metastasis

in 16% reports. Lymph node status was documented in 91% reports with number of lymph nodes involvement was mentioned in 56% reports. Out of which, size of macromets was documented in 54% reports and extranodal involvement in 48% reports. In 86% reports, lymph vascular invasion was documented while present in 65% reports. Treatment effects were documented in 31% reports while present in 13% reports. Pathological staging and TNM was mentioned in 57% reports while TNM descriptor was mentioned only in 19% reports.

Comparison of laboratories on the basis of academic versus non-academic was done for documentation of all elements Table.2. There were statistically significant differences found in documentation of clinical information, DCIS, LCIS, lymph nodes, and treatment effects in academic laboratories (p value < 0.05). However, comparison of documentation of other elements did not show significant difference.

Discussion

For the treatment of breast cancer, biological features of disease and extent of disease are the factors that determine

the stage of disease, contribute in estimation of recurrence risk and help in prediction of response to therapy. These factors are determined by histopathologist on specimen and assessed by clinician on surgical pathology reports made by histopathologist (National Comprehensive Cancer Network, 2017). This is not just a report made by histopathologist on specimen provided by surgeon but it needs all key items required by clinician to make a treatment plan. A surgical pathology report of breast cancer helps in planning for adjuvant therapy, estimation of prognosis and outcome prediction. Histopathologist should fulfill expectations of clinician by providing all details in surgical pathology report. Therefore, a quality communication between histopathologist and clinician is required (Nakhleh, 2011).

Many surgical pathology reports could not satisfy as important elements for prognostication and outcome prediction are absent. According to different surveys, approximately 50% of surgical pathology reports of breast cancer had missing important elements required for patient treatment plan (National Comprehensive Cancer Network, 2017). In our study, none of laboratory has documented all elements. Therefore, a standardized checklist should be designed and followed by histopathologist that helps in providing important information of breast cancer and thus in treatment planning like adjuvant therapy. Many international guidelines had developed protocol of surgical pathology reporting of breast cancer to make standardized and complete reports. That could be followed by histopathologists of different laboratories to improve quality. In our study, we had assessed documentation of all elements against checklist adopted from CAP guidelines to check quality of surgical pathology reports of breast cancer of different laboratories.

It is duty of a surgeon to provide clinical information with specimen along with documentation of specimen type, type of procedure, type of lymph node sampling, specimen laterality then histopathologist can analyze and mentions all these in surgical pathology report. In our study, clinical information was mentioned in 68% of reports, type of procedure was documented in 84% and type of lymph node sampling was mentioned in only 34% reports, whereas specimen laterality was mentioned in 90% reports. These deficiencies could be either by surgeon or histopathologist. The CAP recommends a surgical pathology report of breast cancer should contain tumor site, tumor size, histologic type, histologic grade, and resection margins status. Tumor site was mentioned in 44% of reports in our study. Tumor size is essential for staging of breast carcinoma and thus affects postoperative treatment strategy. It was mentioned in 92% reports in our study. Histologic type and grade are important in determining prognosis. Histologic type was mentioned in 96% and grade in 87% of reports in our study whereas in another study, documented in 100% and 55% respectively (Mamoon et al., 2010). Surgical resection margin status is crucial component of surgical pathology report of breast cancer for postoperative management plan (surgery and radiation therapy) and estimation of local recurrence risk. Margin assessment has significant role in breast conservation surgery (Smitt et al., 1995).

Table 2. Comparison of Laboratories for Documentation of All Elements According to Academic/non Academic Using Chi-Square Test

Elements	Academic	Non-Academic	Total	P-value
Procedure				
Present	56 (66.7%)	28 (33.3%)	84 (100%)	0.009
Not documented	14 (87.5%)	2 (12.5%)	16 (100%)	
Type of lymph node sampling				
Present	28 (82.4%)	6 (17.6%)	34 (100%)	0.053
Not documented	42(63.6%)	24 (36.4%)	66 (100%)	
Clinical Information				
Present	54 (79.4%)	14 (20.6%)	68 (100%)	0.003
Not documented	16(50.5%)	16 (50.5%)	32 (100%)	
Specimen laterality				
Present	61 (67.8%)	29 (32.2%)	90 (100%)	0.146
Not documented	9 (90.0%)	1 (10.0%)	10 (100%)	
Tumor site				
Present	32 (72.7%)	12 (27.3%)	44 (100%)	0.598
Not documented	38 (67.9%)	18 (32.1%)	56 (100%)	
Tumor size				
Present	62 (67.4%)	30 (32.6%)	92 (100%)	0.054
Not documented	8 (100.0%)	0 (00.0%)	8 (100%)	
Histologic Type				
Present	66 (68.8%)	30 (31.3%)	96 (100%)	0.18
Not documented	4 (100.0%)	0 (00.0%)	4 (100%)	
Histologic Grade				
Present	61 (70.1%)	26 (29.9%)	87 (100%)	0.94
Not documented	(69.2%)	9 4 (30.8%)	13 (100%)	
Tumor Focality				
Present	26 (68.4%)	12 (31.6%)	38 (100%)	0.637
Absent	2 (100%)	0 (29.9%)	2 (100%)	
Not documented	42 (70.0%)	18 (30.0%)	60 (100%)	
DCIS				
Present	29 (78.4%)	8 (21.6%)	37 (100%)	0.016
Absent	34 (73.9%)	12 (26.1%)	46 (100%)	
Not documented	7 (41.2%)	10 (58.8%)	17 (100%)	
a) DCIS Size				
Present	15 (78.9%)	4 (21.1%)	19 (100%)	0.101
Absent	1 (25.0%)	3 (75.0%)	4 (100%)	
Not documented	54 (70.1%)	23 (29.9%)	77 (100%)	
b) Architectural pattern				
Present	22 (84.6%)	4 (15.4%)	26 (100%)	0.059
Not documented	48 (64.9%)	26 (35.1%)	74 (100%)	
c) Nuclear grade				
Present	17 (100.0%)	0 (00%)	17 (100%)	0.003
Not documented	53 (63.9%)	30 (36.1%)	83 (100%)	
d) Necrosis				
Present	13 (92.9%)	1 (7.1%)	14 (100%)	0.044
Not documented	57 (66.3%)	29 (33.7%)	86 (100%)	
LCIS				
Present	10 (100%)	0 (00%)	10 (100%)	0.007
Absent	9 (100%)	0 (00%)	9 (100%)	
Not documented	51 (63.0%)	30 (37.0%)	81 (100%)	

Table 2. Continued

Elements	Academic	Non-Academic	Total	P-value
Macroscopic and microscopic extent of tumor				
Present	51 (73.9%)	18 (26.1%)	69 (100%)	0.163
Absent	11 (73.3%)	4 (26.7%)	15 (100%)	
Not documented	8 (50%)	8 (50.0%)	16 (100%)	
Margins				
Present	64 (70.3%)	27 (29.7%)	91 (100%)	0.819
Not documented	6 (66.7%)	3 (33.3%)	9 (100%)	
a) Invasive				
Present	62 (74.7%)	21 (25.3%)	83 (100%)	0.023
Not documented	8 (47.1%)	9 (52.9%)	17 (100%)	
b) DCIS				
Present	10 (62.5%)	6 (37.5%)	16 (100%)	0.475
Not documented	60 (66.7%)	24 (33.3%)	84 (100%)	
Lymph nodes				
Present	41 (73.2%)	15 (26.8%)	56 (100%)	0.042
Absent	26 (74.3%)	9 (25.7%)	35 (100%)	
Not documented	3 (33.3%)	6 (66.7%)	9 (100%)	
a) Size of macromet				
Present	42 (77.8%)	12 (22.2%)	54 (100%)	0.066
Not documented	28 (47.1%)	18 (52.9%)	46 (100%)	
b) Extranodal involvement				
Present	38 (71.2%)	10 (20.8%)	48 (100%)	0.055
Not documented	32 (61.5%)	20 (52.9%)	52 (100%)	
Treatment effects				
Present	12 (92.3%)	1 (7.7%)	13 (100%)	0.038
Absent	15 (83.3%)	3 (16.7%)	18 (100%)	
Not documented	43 (62.3%)	26 (37.7%)	69 (100%)	
Lymph vascular invasion				
Present	43 (66.2%)	22 (33.8%)	65 (100%)	0.434
Absent	17 (81%)	4 (19%)	21 (100%)	
Not documented	10 (71.4%)	4 (28.6%)	14 (100%)	
Pathological staging				
Present	39 (68.4%)	18 (31.6%)	57 (100%)	0.692
Not documented	31 (72.1%)	12 (27.9%)	43 (100%)	
TNM				
Present	39 (68.4%)	18 (31.6%)	57 (100%)	0.692
Not documented	31 (72.1%)	12 (27.9%)	43 (100%)	
TNM Descriptor				
Present	13 (68.4%)	6 (31.6%)	19 (100%)	0.867
Not documented	57 (70.4%)	24 (29.6%)	81 (100%)	

Surgical resection margin status of invasive component was mentioned in 83% reports in our study, may be due to lack of proper labelling of margins by surgeons or presence of breast tissue in pieces. In one study from Pakistan, in situ component was mentioned in only 23.2% (including both DCIS and LCIS) (Mamoon et al., 2010), whereas in our study, DCIS was documented in 83% reports from which it was present in 37%. Size of DCIS was mentioned in 19%. Size of DCIS is important factor as size increases, risk of hidden invasive breast cancer

increases (Sakorafas and Farley, 2003). Lymph node status is an important factor for estimation of prognosis. As number of lymph node involved increases, disease free survival rate decreases. In our study, lymph node status was mentioned in 91% reports and involved lymph node was present in 56% reports. Size of macromet was mentioned in 54% reports and extra capsular spread was documented in 48% reports. These help in estimation of extent of disease metastasis thus influence treatment decision (Michaelson et al., 2003; Blancas et

al., 2006). Lymph vascular invasion is an independent marker of prognosis which influence outcome adversely (Hoda et al., 2006). It was mentioned in 86% reports in our study whereas in another study, it was mentioned in 2.6% reports (Daramola et al., 2016). Evaluation of treatment effects after neo-adjuvant chemotherapy is important prognostic marker (Moriya, 2016). It determines the treatment efficacy of ongoing chemotherapy in the form of response rate. Pathological complete response is associated with increase disease free survival and overall survival. No response or progression of disease results in poor outcome. It was mentioned in 45% of cases in a study, (Provenzano et al., 2013) and were documented in 31% reports in our study. TNM staging should be accurate and depends on exact tumor size and lymph node status because all therapeutic options are planned accordingly.

This study shows quality of surgical pathology reports of breast cancer could not met minimum dataset. Many elements were missing in breast cancer surgical pathology reports that were required either for decision of treatment, or help in estimation of prognosis or prediction of clinical outcome because of unknown reason. It could be due to limited knowledge of histopathologist about breast cancer, or it may be due to work load. It may be due to histopathologist's insufficient familiarity with guidelines or consider documentation of every element as less important. This study may increase awareness and enhance performance of histopathologist of different laboratories. This study also emphasizes the importance of a dedicated breast cancer histopathologist to be involved in surgical pathology reporting of breast cancer and introduction of standardized checklist according to international guidelines.

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