2.3 Histological and molecular characteristics

Invasive breast cancer

Of 1,853 invasive breast cancers, the five most common histological types were ductal (82.4%), lobular (4.9%), mucinous (3.9%), microinvasive (1.3%), papillary (1.0%) and tubular (1.0%). Grade 3 invasive breast cancer was found in 37.4% of the cases. Lymphovascular invasion was observed in 31.6% of the cases. About 14% were multifocal with distance of foci 5 mm apart in the same breast quadrant and only 4.0% were multicentric, defined as breast cancers occurring in more than one quadrant of the breast. (Table 2.3.1)

Table 2.3.1 Histological type, grading, multifocality and multicentricity of invasive breast cancers(N=1,853)

	Number (%)
Histological type	
Ductal	1,527 (82.4%)
Lobular	91 (4.9%)
Mucinous (colloid)	72 (3.9%)
Microinvasive	24 (1.3%)
Papillary	19 (1.0%)
Tubular	19 (1.0%)
Medullary	15 (0.8%)
Mixed ductal and lobular	13 (0.7%)
Borderline/ malignant phyllodes	11 (0.6%)
Metaplastic carcinoma	6 (0.3%)
Micropapillary	6 (0.3%)
Paget's disease of nipple	4 (0.2%)
Apocrine carcinoma	4 (0.2%)
Adenoid cystic carcinoma	2 (0.1%)
Cribiform carcinoma	2 (0.1%)
Inflammatory	2 (0.1%)
Neuroendocrine carcinoma	2 (0.1%)
Others	6 (0.3%)
Unknown	32 (1.7%)
Grading	
Grade 1	287 (15.5%)
Grade 2	726 (39.2%)
Grade 3	693 (37.4%)
Unknown	146 (7.9%)
Lymphovascular invasion	585 (31.6%)
Multifocality	257 (13.9%)
Number of foci	
2	146 (56.7%)
3-4	75 (29.0%)
⩾ 5	37 (14.3%)
Multicentricity	74 (4.0%)
Number of quadrants	
2	63 (84.5%)
3	7 (9.9%)
4	4 (5.6%)

In invasive breast cancers, 75.5% were estrogen receptor positive (ER+), 63.5% were progesterone receptor positive (PR+) and 23.1% were human epidermal growth factor receptor 2 positive (HER2+) (Table 2.3.2). The three most common molecular subtypes of invasive breast cancer were ER+PR+HER2- (48.6%), ER-PR-HER2- (12.1%) and ER+PR-HER2- (10.3%) (Table 2.3.3).

Table 2.3.2. Molecular characteristics of invasive breast cancers

	Number (%)
Estrogen receptor (ER) (N=1,794)	
Positive	1,354 (75.5%)
Negative	440 (24.5%)
Progesterone receptor (PR) (N=1,790)	
Positive	1,137 (63.5%)
Negative	653 (36.5%)
cerbB2/ HER 2 (N=1,746)	
Positive	403 (23.1%)
Negative	1,343 (76.9%)
Ki67 index (N=1,053)	
<12%	506 (48.1%)
12-50%	432 (41.0%)
>50%	115 (10.9%)

HER 2: human epidermal growth factor receptor 2

Table 2.3.3. Molecular subtypes of estrogen receptor, progesterone receptor and HER 2 receptor in 1,853 invasive breast cancers

	Number (%)
ER+PR+HER2+	158 (8.5%)
ER+PR+HER2-	901 (48.6%)
ER+PR-HER2+	69 (3.7%)
ER+PR-HER2-	191 (10.3%)
ER-PR+HER2+	19 (1.0%)
ER-PR+HER2-	28 (1.5%)
ER-PR-HER2+	159 (8.6%)
ER-PR-HER2-	224 (12.1%)
Unknown	106 (5.7%)

ER+: estrogen receptor positive; ER-: estrogen receptor negative;
PR+: progesterone receptor positive; PR-: progesterone receptor negative
HER2+: human epidermal growth factor receptor 2 positive; HER2-: human epidermal growth factor receptor 2 negative

In situ breast cancer

The most common histological type of in situ breast cancer was ductal (91.7%). Over 60% had necrosis and 46.1% were of high nuclear grade. Multifocality and multicentricity were found in 10.6% and 2% of in situ breast cancers (Table 2.3.4).

Table 2.3.4 Histological type, grade, multifocality and multicentricity of in situ breast cancers

	Number (%)
Histological type	
Ductal	231 (91.7%)
Lobular	2 (0.8%)
Others	11 (4.4%)
Unknown	8 (3.1%)
Necrosis	170 (67.4%)
Nuclear Grade	
Low	57 (22.6%)
Intermediate	79 (31.3%)
High	116 (46.1%)
Multifocality	26 (10.6%)
Number of foci	
2	19 (73.7%)
3	5 (21.0%)
4	5 (5.3%)
Multicentricity	5 (2.0%)
Number of quadrants	
2	4 (75.0%)
3	1 (25.0%)

Among in situ breast cancers, 76.9% were ER+, 65.7% were PR+ and 33.3% were HER2+ (Table 2.3.5). The mammographic detection of microcalcifications was found in 57.7% of in situ breast cancers (Figure 2.3.1).

Table 2.3.5 Molecular characteristics of in situ breast cancers

	Number (%)
Estrogen receptor (ER) (N=212)	
Positive	163 (76.9%)
Negative	49 (23.1%)
Progesterone receptor (PR)(N=210)	
Positive	138 (65.7%)
Negative	72 (34.3%)
cerbB2/ HER 2(N=204)	
Positive	68 (33.3%)
Negative	136 (66.7%)
Ki67 index (N=96)	
<12%	63 (65.7%)
12-50%	31 (32.0%)
>50%	2 (2.3%)

HER 2: human epidermal growth factor receptor 2

Figure 2.3.1 Mammographic findings of in situ breast cancers (N=241)