

**Table S1** Core needle biopsy diagnosis errors in determining invasive cancer

Variables	All (n=1,415)	True (n=1,297)	False (n=118)	P value
BI-RADS				0.268
3	8 (0.57)	8 (0.62)	0 (0.00)	
4a	141 (9.96)	123 (9.48)	18 (15.3)	
4b	349 (24.7)	319 (24.6)	30 (25.4)	
4c	681 (48.1)	632 (48.7)	49 (41.5)	
5	236 (16.7)	215 (16.6)	21 (17.8)	
Side				0.082
Left	737 (52.1)	666 (51.3)	71 (60.2)	
Right	678 (47.9)	631 (48.7)	47 (39.8)	
Tissue composition				0.711
Fat	312 (22.0)	288 (22.2)	24 (20.3)	
Fibroglandular	908 (64.2)	833 (64.2)	75 (63.6)	
Mix	195 (13.8)	176 (13.6)	19 (16.1)	
Age	51.5±11.8	51.5±11.8	51.3±11.5	0.833
Height	158±8.86	158±9.12	158±5.25	0.149
Weight	57.2±5.06	57.2±5.13	57.1±4.36	0.881
Max	25.2±16.6	24.6±16.4	32.3±17.5	<0.001
Vertical	19.5±12.4	19.1±12.4	23.3±11.6	<0.001
Thickness	13.1±7.43	13.2±7.58	12.1±5.37	0.035

Data are presented as mean ± standard deviation or number (%). BI-RADS, Breast Imaging Reporting and Data System.

**Table S2** Core needle biopsy diagnosis errors in determining invasive ER

Variables	All (n=1,415)	True (n=1,370)	False (n=45)	P value
BI-RADS				0.638
3	8 (0.57)	8 (0.58)	0 (0.00)	
4a	141 (9.96)	137 (10.0)	4 (8.89)	
4b	349 (24.7)	334 (24.4)	15 (33.3)	
4c	681 (48.1)	660 (48.2)	21 (46.7)	
5	236 (16.7)	231 (16.9)	5 (11.1)	
Side				1
Left	737 (52.1)	714 (52.1)	23 (51.1)	
Right	678 (47.9)	656 (47.9)	22 (48.9)	
Tissue composition				0.747
Fat	312 (22.0)	300 (21.9)	12 (26.7)	
Fibroglandular	908 (64.2)	881 (64.3)	27 (60.0)	
Mix	195 (13.8)	189 (13.8)	6 (13.3)	
Age	51.5±11.8	51.5±11.9	52.1±9.58	0.658
Height	158±8.86	158±8.92	158±6.92	0.579
Weight	57.2±5.06	57.1±5.10	58.1±3.67	0.092
Max	25.2±16.6	25.1±16.4	30.9±20.8	0.070
Vertical	19.5±12.4	19.4±12.4	21.2±12.2	0.332
Thickness	13.1±7.43	13.2±7.50	12.3±4.66	0.227

Data are presented as mean ± standard deviation or number (%). ER, estrogen receptor; BI-RADS, Breast Imaging Reporting and Data System.

**Table S3** Core needle biopsy diagnosis errors in determining PgR

Variables	All (n=1,415)	True (n=1,335)	False (n=80)	P value
BI-RADS				0.92
3	8 (0.57)	8 (0.60)	0 (0.00)	
4a	141 (9.96)	135 (10.1)	6 (7.50)	
4b	349 (24.7)	330 (24.7)	19 (23.8)	
4c	681 (48.1)	641 (48.0)	40 (50.0)	
5	236 (16.7)	221 (16.6)	15 (18.8)	
Side				0.266
Left	737 (52.1)	690 (51.7)	47 (58.8)	
Right	678 (47.9)	645 (48.3)	33 (41.2)	
Tissue composition				0.694
Fat	312 (22.0)	292 (21.9)	20 (25.0)	
Fibroglandular	908 (64.2)	857 (64.2)	51 (63.7)	
Mix	195 (13.8)	186 (13.9)	9 (11.2)	
Age	51.5±11.8	51.4±11.8	54.0±11.5	0.047
Height	158±8.86	158±8.05	157±17.6	0.544
Weight	57.2±5.06	57.2±4.96	57.0±6.58	0.886
Max	25.2±16.6	25.0±16.6	29.9±16.9	0.013
Vertical	19.5±12.4	19.3±12.4	22.6±12.2	0.02
Thickness	13.1±7.43	13.1±7.54	13.7±5.14	0.307

Data are presented as mean ± standard deviation or number (%). PgR, progesterone receptor; BI-RADS, Breast Imaging Reporting and Data System.

**Table S4** Core needle biopsy diagnosis errors in determining HER2

Variables	All (n=1,415)	True (n=1,393)	False (n=22)	P value
BI-RADS				0.137
3	8 (0.57)	8 (0.57)	0 (0.00)	
4a	141 (9.96)	135 (9.69)	6 (27.3)	
4b	349 (24.7)	346 (24.8)	3 (13.6)	
4c	681 (48.1)	671 (48.2)	10 (45.5)	
5	236 (16.7)	233 (16.7)	3 (13.6)	
Side				0.654
Left	737 (52.1)	724 (52.0)	13 (59.1)	
Right	678 (47.9)	669 (48.0)	9 (40.9)	
Tissue composition				0.774
Fat	312 (22.0)	306 (22.0)	6 (27.3)	
Fibroglandular	908 (64.2)	894 (64.2)	14 (63.6)	
Mix	195 (13.8)	193 (13.9)	2 (9.09)	
Age	51.5±11.8	51.5±11.8	52.9±12.2	0.604
Height	158±8.86	158±8.91	158±4.60	0.812
Weight	57.2±5.06	57.2±5.09	56.8±3.36	0.647
Max	25.2±16.6	25.2±16.6	26.2±19.1	0.818
Vertical	19.5±12.4	19.5±12.4	18.5±11.1	0.7
Thickness	13.1±7.43	13.1±7.35	14.6±11.7	0.562

Data are presented as mean ± standard deviation or number (%). HER2, human epidermal growth factor receptor-2; BI-RADS, Breast Imaging Reporting and Data System.

**Table S5** Core needle biopsy diagnosis errors in determining Ki-67

Variables	All (n=1,415)	True (n=1,205)	False (n=210)	P value
BI-RADS				0.039
3	8 (0.57)	6 (0.50)	2 (0.95)	
4a	141 (9.96)	117 (9.71)	24 (11.4)	
4b	349 (24.7)	292 (24.2)	57 (27.1)	
4c	681 (48.1)	575 (47.7)	106 (50.5)	
5	236 (16.7)	215 (17.8)	21 (10.0)	
Side				0.867
Left	737 (52.1)	626 (52.0)	111 (52.9)	
Right	678 (47.9)	579 (48.0)	99 (47.1)	
Tissue composition				0.03
Fat	312 (22.0)	271 (22.5)	41 (19.5)	
Fibroglandular	908 (64.2)	780 (64.7)	128 (61.0)	
Mix	195 (13.8)	154 (12.8)	41 (19.5)	
Age	51.5±11.8	51.4±11.8	52.0±12.0	0.475
Height	158±8.86	158±9.31	158±5.64	0.633
Weight	57.2±5.06	57.2±5.05	57.1±5.14	0.897
Max	25.2±16.6	26.1±17.3	20.5±11.1	<0.001
Vertical	19.5±12.4	20.1±12.9	15.6±8.20	<0.001
Thickness	13.1±7.43	13.4±7.09	11.5±8.98	0.004

Data are presented as mean ± standard deviation or number (%). BI-RADS, Breast Imaging Reporting and Data System.