No FOMO for TOMO: ADH Upstage in the Era of Breast Tomosynthesis

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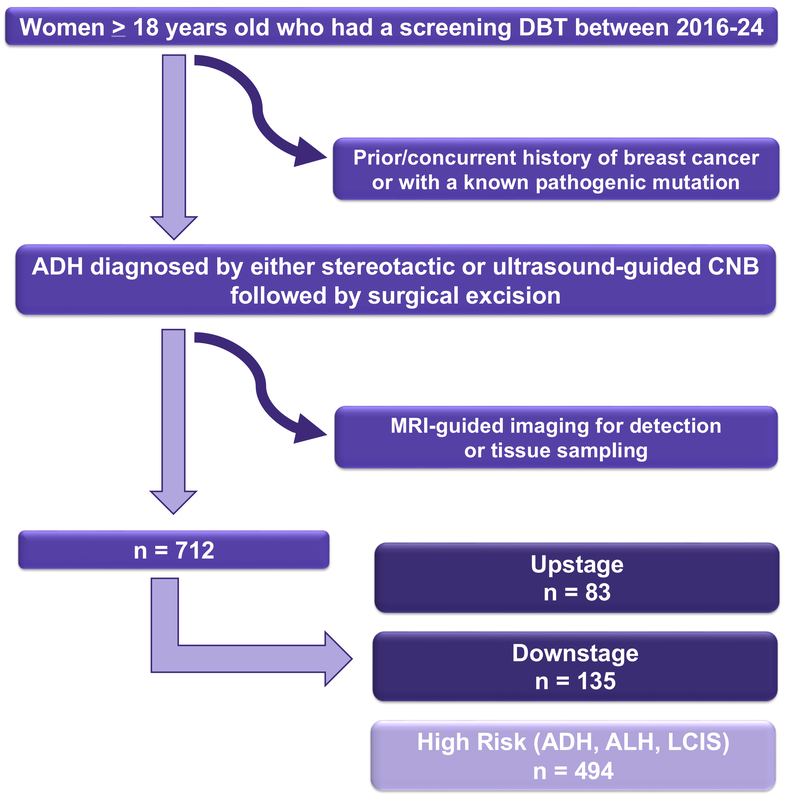
Background

Surgical excision is still recommended for atypical ductal hyperplasia (ADH) because of the upstaging to DCIS or invasive breast cancer in 15-30% of cases as reported in the literature – despite the recent overall trend towards active surveillance for other benign, high-risk lesions. Given recent advancements in breast imaging such as the adoption of digital breast tomosynthesis (DBT) with improved spatial resolution, and vacuum-assisted core needle biopsy (VAB) techniques, we hypothesized that the overall upstage rate for ADH would be lower than previously reported with 2D mammography and conventional CNB techniques. We also aimed to identify specific clinical, imaging, and biopsy features that would allow for a more tailored approach towards recommending surgical excision vs. active surveillance.

Methods

After obtaining Northwestern University institutional review board approval for this study, we queried our institutional Enterprise Data Warehouse to extract electronic health record data for this retrospective review. Our population was categorized into three groups based on final surgical pathology: biopsy-proven ADH that led to upstage (invasive cancer, DCIS), downstage (benign), or remained high risk (ADH, ALH, LCIS). Only the upstage and downstage groups (n = 218) were included in this analysis.



Results

Table 1. Demographics

	Upstage (n = 83)	Downstage (n = 135)	p-value
Age at biopsy*	58 (51, 68)	52 (46, 59)	<0.001
Menopausal status			0.002
Pre-menopausal	18 (22%)	57 (43%)	
Post-menopausal	64 (78%)	75 (57%)	
Race/Ethnicity			0.5
Asian	5 (6.0%)	7 (5.2%)	
Black/AA	12 (14%)	19 (14%)	
Hispanic/Latino	7 (8.4%)	15 (11%)	
Pacific Islander	2 (2.4%)	0 (0%)	
White	56 (67%)	5 (3.7%)	
Unknown	1 (1.2%)	89 (66%)	
BMI*	26.3 (22.9, 29.8)	26.4 (23.5, 32.0)	0.3
Family history of BC	39 (47%)	92 (68%)	0.002
Breast Density			0.6
A	2 (2.4%)	2 (1.5%)	
B	25 (30%)	35 (26%)	
C	46 (55%)	85 (64%)	
D	10 (12%)	11 (8.3%)	

* median (range)

Table 2. Upstage Findings

Upstage Cases n (%)	**83 (12.1%)**
Ductal Carcinoma in Situ	67 (81%)
Grade	
1	36 (54%)
2	26 (39%)
3	5 (7.5%)
Invasive Breast Cancer	16 (19%)
Ductal	12 (14%)
Lobular	3 (3.6%)
Tubular	1 (1.2%)
Stage T1	16 (100%)
T1mi	5 (31%)
T1a	6 (38%)
T1b	1 (6.3%)
T1c	4 (25%)
SBR Grade	
1	12 (75%)
2	4 (25%)
3	0 (0%)
ER+	83 (100%)
PR+	76 (93%)
HER2+	1 (7.1%)

Results

Table 3. Imaging Factors

	Upstage (n = 83)	Downstage (n = 135)	p-value
Calcifications	66 (80%)	107 (79%)	>0.9
Fine	17 (20%)	8 (5.9%)	0.001
Pleomorphic	15 (18%)	11 (8.1%)	0.028
Asymmetry	12 (14%)	7 (5.2%)	0.018
Focal	9 (11%)	4 (3.0%)	0.035
Mass	19 (23%)	22 (16%)	0.2
Distortion	5 (6.0%)	6 (4.4%)	0.8
Multiple findings	16 (19%)	6 (4.4%)	<0.001
Lesion size (cm)*	8 (5, 12)	7 (4, 11)	0.045

* median (range)

Table 4. Biopsy Details

	Upstage (n = 83)	Downstage (n = 135)	p-value
Modality			0.2
Stereotactic	66 (80%)	117 (87%)	
Ultrasound	17 (20%)	18 (13%)	
Number of cores*	6 (3, 9)	6 (3, 9)	0.9
Needle gauge			0.7
9	66 (80%)	112 (84%)	
10	0 (0%)	1 (0.7%)	
12	11 (13%)	12 (9.0%)	
14	5 (6.1%)	9 (6.7%)	
Biopsy device			0.8
Spring-assisted	15 (18%)	19 (14%)	
Vacuum-assisted	67 (81%)	114 (84%)	
Unknown	1 (1.2%)	2 (1.5%)	
ADH features			
Focal	19 (23%)	52 (39%)	0.017
Bordering on DCIS	8 (9.6%)	0 (0%)	<0.001

* median (range)

Conclusions/Future Directions

- In our population of tomosynthesis-screened patients from a single institution, the upstage rate is lower than previously reported.
- Most cases upstaged to low-grade DCIS.
- Of the cases that upstaged to invasive cancer, two-thirds were T1mic or T1a.
- All upstaged cases were ER+.
- Future directions include analysis of our entire cohort (including patients with high-risk lesions after surgical excision) and modeling of patient, imaging, and biopsy characteristics to predict patients who are at highest and lowest risk of upstaging.