UT Southwestern Medical Center
Radiology

Impact Of Multidisciplinary Team Review On The Management And Surgical Upgrade Rates Of High-risk Breast Lesions Identified On Imaging-guided Needle Biopsy

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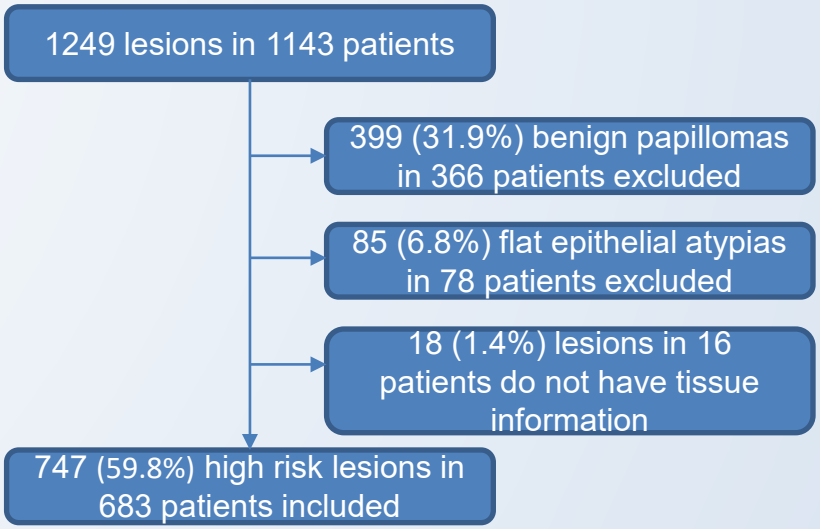
Purpose

To compare the surgical excision, cancer upgrade and chemoprophylaxis rates before (01/01/2014- 07/31/2018) and after (08/01/2018-05/31/2021) the implementation of multidisciplinary management review (MDC) to guide the management of high-risk breast lesions in our institution.

MDC Process

- All atypical ductal hyperplasia (ADH), lobular neoplasia (LCIS and ALH), atypical papillary lesion and radial scars were reviewed in MDC comprising dedicated breast pathologists, radiologists, surgical oncologist and genetic counselor.
- Lesion imaging features, size, sampling adequacy, pathologic severity and extent of atypia (single vs multiple foci involved), patient's personal risk facors and cancer hisoty was reviewed.
- A consensus management recommendation was made that includes
    - Excision vs observation
    - Chemoprophylaxis vs none

Inclusion Criteria - Study Population

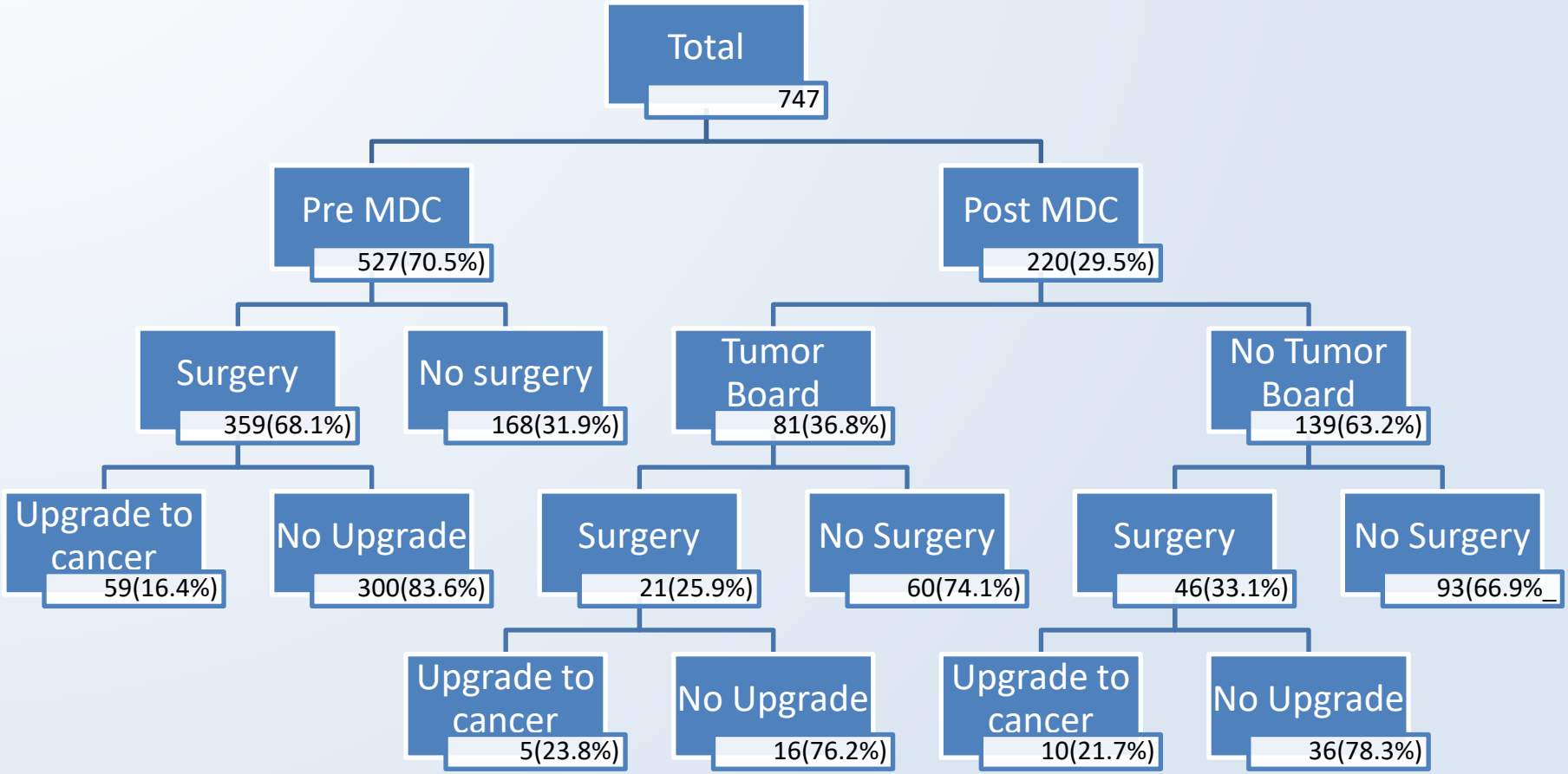


		N	%
Biopsy Modality*	MRI	102	14.4
	Stereo	443	62.5
	US	164	23.1
Lesion Size (cm)	<1	355	50.6
	>=1	347	49.4
Needle Gauge	<10G	530	73.1
	>=10G	195	26.9
N of cores	<12	357	49.6
	>=12	363	50.4
Family Hx	No	493	66.3
	Yes	251	33.7
Current Breast CA	No	644	86.8
	Yes	98	13.2
History of breast cancer	No	615	82.6
	Yes	130	17.4

		N	%
Mammo Density	A - Fatty	9	1.2
	B - Scattered Areas of Density	378	51.3
	C - Heterogenously Dense	313	42.5
	D - Extremely Dense	37	5
Detection Modality	Mammo	519	69.9
	MRI	109	14.7
	US	115	15.5
Lesion Type Rad	Architectural distortion	72	9.7
	Asymmetry	20	2.7
	Calcification	381	51.1
	Mass	199	26.7
	Mass like enhancement	35	4.7
	Nonmass like enhancement	39	5.2

*38 lesions underwent excisional biopsy

Tumor Board, Surgery and Upgrade Distribution by Lesion



Comparison of surgical excision and cancer upgrade rates of high-risk lesions diagnosed at core needle biopsy before and after the implementation of multidisciplinary clinic review

			MDC Intervention			P value	Odds Ratio (95% CI)
			Pre	Post	Total		
Surgical excision	No	N	168	153	321	<0.001	0.2 (0.1-0.3)
		%	31.9%	69.5%	43.0%		
	Yes	N	359	67	426		
		%	68.1%	30.5%	57.0%		
Total		N	527	220	747		
Upgrade to cancer*	Benign	N	300	52	352	0.3	1.5 (0.8-2.8)
		%	83.6%	77.6%	82.6%		
	Invasive +DCIS	N	59	15	74		
		%	16.4%	22.4%	17.4%		
Total		N	359	67	426		
Chemo prophylaxis (*)	No	N	382	162	544	0.028	1.5 (1.1-2.3)
		%	81.3%	73.6%	78.8%		
	Yes	N	88	58	146		
		%	**18.7%**	**26.4%**	21.2%		
Total		N	470	220	690		

Chemoprophylaxis info is missing for 47 patients

Surgical excision rate significantly decreased after implementation of MDC. There was no change in surgical upgrade rate to cancer (*invasive cancer or ductal carcinoma in situ). Chemoprophylaxis use increased significantly after implementation of MDC

			Surgery			P	Odds Ratio (95% CI)
			No	Yes	Total		
MDC Recommendation	No Surgery	N	43	1	44	<0.001	50.6 (6.3-407.1)
		%	97.7%	2.3%	100%		
	Surgery	N	17	20	37		
		%	45.9%	54.1%	100%		
Total		N	60	21	81		

Overall compliance:

43+20(63)/81 (77.7%)

While compliance was high for 'no surgery' decision by MD, it was low for surgery decision.

			Chemoprevention			P	Odds Ratio (95% CI)
			No	Yes	Total		
MDC Recommendation	Follow up	N	33	3	36	0.001	N/A
		%	91.7%	8.3%	100%		
	Follow-up & Chemoprevention	N	6	2	8		
		%	75.0%	25.0%	100%		
	Surgery	N	27	7	34		
		%	79.4%	20.6%	100%		
	Surgery & Chemoprevention	N	0	3	3		
		%	0.0%	100%	100%		
Total		N	66	15	81		

33+2+27+3(65)/81 (80.2%)

MDC board status and MDC surgery Recommendation by high risk lesion type

			Sent to MDC board			P	Odds Ratio (95% CI)
			No	Yes	Total		
High Risk lesion type	Atypical ductal hyperplasia (ADH)	N	45	33	78	<0.001	N/A
		%	57.7%	42.3%	100.0%		
	Atypical lobular hyperplasia (ALH)	N	22	25	47		
		%	46.8%	53.2%	100.0%		
	Atypical papilloma (AP)	N	2	3	5		
		%	40.0%	60.0%	100.0%		
	Lobular carcinoma in-situ (LCIS)	N	13	10	23		
		%	56.5%	43.5%	100.0%		
	Radial scar (RS)	N	57	10	67		
		%	85.1%	14.9%	100.0%		
Total		N	139	81	220		

			MDC Surgery Recommendation			P	Odds Ratio (95% CI)
			No	Yes	Total		
High Risk lesion type	Atypical ductal hyperplasia (ADH)	N	19	14	33	0.04	N/A
		%	57.6%	42.4%	100.0%		
	Atypical lobular hyperplasia (ALH)	N	18	7	25		
		%	72.0%	28.0%	100.0%		
	Atypical papilloma (AP)	N	0	3	3		
		%	0.0%	100.0%	100.0%		
	LCIS - Lobular carcinoma in-situ (LCIS)	N	3	7	10		
		%	30.0%	70.0%	100.0%		
	Radial scar (RS)	N	4	6	10		
		%	40.0%	60.0%	100.0%		
Total		N	44	37	81		

-While atypical ductal hyperplasia, Atypical lobular hyperplasia, Atypical papilloma and Lobular carcinoma in-situ were sent to MDC, most of RS were not discussed in MDC.

-Of the radial scar and lobular carcinoma in-situ that were sent to MDC, 60% and 70% had surgery, respectively.

-All AP underwent surgery

Association of lesion size with MDC review, MDC recommendation and Surgical excision

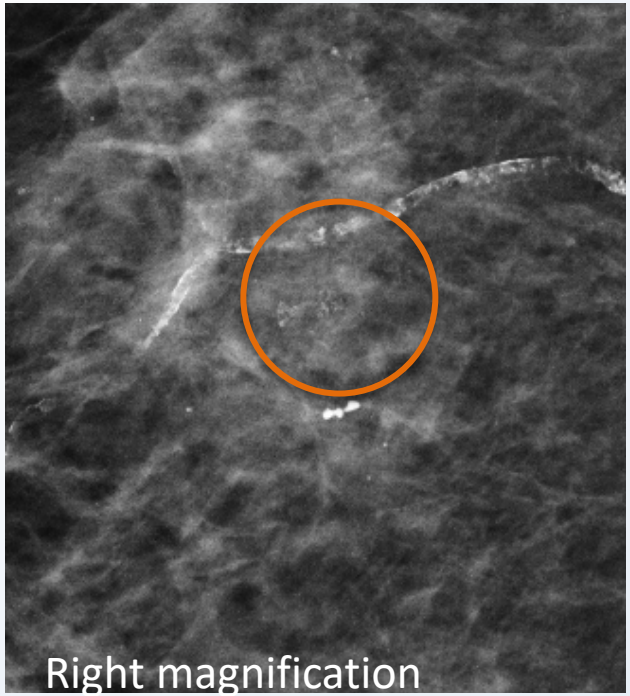
MDC review performed	Mean size(cm)	N	P
No	2.1	132	0.027
Yes	1.2	74	
Total	1.8	206	
MDC Recommendation			
Observation	0.8	39	0.001
Excision	1.7	35	
Total	1.2	74	
Surgery performed after MDC review			
No	1.1	54	0.017
Yes	1.7	20	
Total	1.2	74	

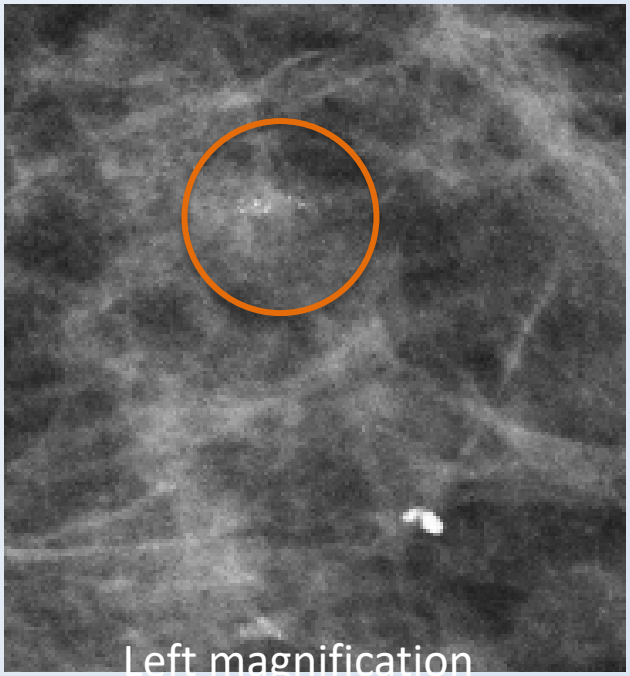
-Larger lesions were more likely to bypass MDC review and directly undergo surgery.

- Mean size of lesions recommended for excision and and performed following recommendation were higher

16 (45.7%) of 35 lesions MDC recommended surgery however observation was performed
1 (2.6%) of 39 lesions MDC recommended observation but surgery performed instead.

Example Case





Imaging

- 5mm amorphous calcifications in the left breast are suspicious and 7mm coarse heterogeneous calcifications in the right breast.

Biopsy

- Left breast, calcifications, 12:00, 5 cm from nipple, stereotactic core biopsy: A single terminal duct with atypical ductal hyperplasia
- Right breast, calcifications, 1:00, 5 cm from nipple, stereotactic core biopsy: -Multiple cores with atypical ductal hyperplasia (ADH) bordering on ductal carcinoma in-situ,

MDC

- Recommendation : excise right breast and to observe left breast. Patient opted to have both areas removed

Surgery

- Left breast: Ductal carcinoma in situ, 3-4 scattered foci (largest focus 3 mm), low grade
- Right breast : Few (3-4) scattered foci of residual atypical ductal hyperplasia

Conclusion and Discussion

- Overall *surgical excision rate* for high risk lesions (HRL) significantly decreased after implementation of MDC (***68.1% vs 30.5%, p<0.001***).
- However, not all lesions underwent MDC after it was implemented. Between lesions that underwent MDC review vs no review after its implementation, there was no significant difference between ***surgical excision rates (25.9% vs 33.1%, p=0.2***) or upgrade to cancer ***(23.8% vs 21.7%, p=1.0)***.
- Chemoprophylaxis rate significantly improved (***18.7% vs 26.4% p<0.05***)
- ***Provider education*** during MDC may be responsible for the decrease in surgical excisions after MDC implementation.
- However patient selection for excision remains ***heterogeneous*** and ***subjective*** as evidenced by continuing excision of radial scars and very low upgrade rates for some HRL.
- Hence, patients may benefit from ***multiparametric models*** that integrate imaging data to help predict their risk of surgical cancer upgrade and facilitate their decision making.