



Cost Analysis on Diagnostic Excisional Biopsy for Benign-on-Biopsy BI-RADS 3 and 4 Breast Lesions.

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INTRODUCTION

Diagnostic excisional biopsy performed for BIRADS 3 and 4 breast lumps despite initial benign core biopsy (benign-on-biopsy) results is frequently practiced. We aim to investigate the extra cost incurred from diagnostic excision following a benign percutaneous core biopsy, and determine the imaging parameters most consistently related to benign histopathological results in BI-RADS 3 and 4 lesions.

METHODOLOGY

This cross-sectional study included patients with BI-RADS 3 and 4 breast lesions who underwent diagnostic excisional biopsy following a benign core biopsy in Hospital Canselor Tuanku Muhriz from 2008 to 2022. The cost and imaging parameters were analysed in relation to the final HPE for each BI-RADS category.

RESULTS

206 patients were included in this study.

The cost of performing diagnostic excisional biopsy was higher than surveillance [median MYR 6894 (239.25) vs MYR 132 (144), p-value = 0.001].

Seven out of 206 (3.4%) patients had complications, with 4 of them requiring readmission with a mean cost of MYR 4643.5 (2399.4).

The total cost for diagnostic excisional biopsy with benign final HPE was MYR 861,640.

The most consistent imaging parameter with benign HPE was the ultrasonographically circumscribed margin of the breast lesion (p-value = 0.02).

Additionally, there was a significant association (p-value = 0.008) between the BI-RADS category and HPE result of the excisional biopsy; with BI-RADS 3 had the least risk of malignancy (2.3%), followed by other BI-RADS 4 subcategories (4a, 6.3%; 4b, 10.0%; 4c, 33.3%).

Table 1.0: Ultrasound Parameters in Relation to Excisional Biopsy Results

Ultrasound Parameters (n=187)	Benign n (%)	Malignant n (%)	p-value
Mass			
- Margin (n=187)			
o Circumscribed (n=118)	115 (97.5)	3 (2.5)	0.02 ^t
o Non-circumscribed (n=69)	61 (88.4)	8 (11.6)	
- Indistinct	48 (87.3)	7 (12.7)	1.00*
- Angular	1 (100)	0 (0)	
- Microlobulated	8 (88.9)	1 (11.1)	
- Spiculated	4 (100)	0 (0)	
- Shape (n=187)			
o Oval	66 (97.1)	2 (2.9)	0.102*
o Round	56 (96.6)	2 (3.4)	
o Irregular	54 (88.5)	7 (11.5)	
- Orientation (n=187)			
o Parallel	88 (96.7)	3 (3.3)	0.214*
o Not parallel	88 (91.7)	8 (8.3)	
- Echo pattern (n=187)			
o Hypoechoic	123 (93.9)	8 (6.1)	1.00 ^t
o Non-hypoechoic	53 (94.6)	3 (5.4)	
- Posterior features (n=187)			
o Shadow	47 (94)	3 (6.0)	0.95*
o Enhancement	32 (97)	1 (3.0)	
o Combined pattern	9 (100)	0 (0)	
o No posterior features	88 (92.6)	7(7.4)	
Calcifications			
- No	160 (94.1)	10 (5.9)	1.00*
- Yes (n=17)	16 (94.1)	1 (5.9)	
Others			
- Lymph nodes (n=2)	1 (50)	1 (50)	0.114 ^t

^t Chi-square test

* Fisher's exact test

Table 2.0: Cost between surgery and presumed observation in patients with benign final HPE

	Surgery (n=170)	Observation (n=170)	p-value ^t
Cost in MYR (Median - IQR)	6894 (239.25)	132 (144)	0.001

^t Wilcoxon signed-rank test

Table 3.0: Benign-on-biopsy lesions in comparison to malignant excisional biopsy and the BI-RADS category

Core Biopsy HPE (n = 13)	Excisional biopsy HPE	BI-RADS
Fibroepithelial lesion (6)		
Fibroadenoma (1)	Fibroadenoma with small foci of low-grade DCIS	3
Benign breast tissue (2)	Encapsulated papillary carcinoma with microinvasion	4B
	Microinvasive carcinoma with high-grade DCIS	4C
Fibrotic breast tissue (1)	Invasive carcinoma with high-grade DCIS	4A
Fibrous involution with foci of usual ductal hyperplasia (1)	Invasive carcinoma with foci of high- grade DCIS	4C
Fibroepithelial lesion (1)	Malignant phyllodes	4B
Papillary lesions (5)		
Intraductal papilloma (2)	Low-grade DCIS with comedo necrosis arising in a papilloma	3
	Low- to intermediate-grade DCIS	4A
Benign papillary lesion (2)	Intraductal papilloma with microinvasion	4A
	Non-invasive papillary carcinoma with low-grade DCIS	3
Papillary lesion with areas of usual ductal hyperplasia (1)	Mucinous carcinoma with DCIS component	4B

CONCLUSION

Diagnostic breast excisional biopsy procedures in benign-on-biopsy BI-RADS 3 and 4 lesions are associated with substantial costs borne by the healthcare and patients. Careful discretion of the procedure based on individual risk assessment is imperative to avoid unnecessary costs and morbidities.

REFERENCE

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