



## Non-surgical treatment for ductal carcinoma in situ of the breasts – a prospective study on patient’s perspective

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### ABSTRACT

**Introduction:** Several ongoing trials are currently investigating the feasibility and non-inferiority of active surveillance for managing low-risk DCIS. However, little is known on the proposed non-surgical treatment for DCIS from patient’s perspective.

**Methods:** A prospective cohort study was performed on 1000 consecutive patients aged 18 to 90 years old with various breast disorders between 1st July 2019 and 31st December 2019. Patients were asked about their opinions on non-surgical treatments for DCIS after thorough explanation of the clinical scenario.

**Results:** Median age was 55 years old (Range 18 – 87). 692 patients had past history of breast cancer, 279 patients had benign breast conditions, 29 patients had borderline breast lesions. 891 (89.1%) patients opted for standard surgical excision for low-risk DCIS, most of them ( $N = 757$ , 85.0%) decided for operative management for DCIS to avoid life-time anxiety of disease progression. Patients of older age and with history of malignant breast conditions are more likely to choose surgical treatment for DCIS ( $p < 0.0001$ ). Of note, 112 (11.2%) patients in the cohort had history of DCIS with excision done, 111 (99.1%) patients would still decide for surgical excision as the treatment of DCIS, only 1 patient expressed the wish for conservative treatment for DCIS.

**Conclusion:** Majority of patients decided for surgical treatment for DCIS despite being offered the condition that conservative treatment could be oncologically safe. Patient anxiety and cost of extensive breast surveillance are two important factors.

### Introduction

Whether or not we are over-treating ductal carcinoma in situ (DCIS) with complete surgical removal of the tumor has been subjected to much debate over the last decade [1,2]. Due to improved breast cancer awareness in the general public as well as increased availability of breast cancer screening, incidence of DCIS has increased from 1.87 cases per 100,000 US population during the 1970s to 32.5 cases per 100,000 population in 2004 [3,4].

Current standard of treatment of DCIS is by completely removing the tumor - lumpectomy followed by adjuvant radiotherapy (or for more extensive disease, mastectomy). However, a recent retrospective cohort study has shown that breast cancer specific survival rates were identical among patients with low grade DCIS regardless of the treatment received (surgery or active surveillance) [5]. In addition, meta-analysis of four randomized controlled trials on more than thirty-seven hundred

patients revealed that radiotherapy after lumpectomy for DCIS resulted in decreased risk of local recurrence (hazard ratio of 0.46), but not improving the survival [6]. A recent randomized controlled trial by Radiation Therapy Oncology Group echoed with similar finding that lumpectomy with adjuvant radiotherapy resulted in decreased risk of local recurrence rate to only 0.9% at median 7.2-years follow-up period, although survival data was lacking [7]. With the increase in understanding of the biology of DCIS, there is much controversy in the possibility of overdiagnosis of these lesions found by screening and consequently over-treatment of such lesions [7], and that there is a possibility that such lesions would not need any surgical interventions based on natural history of the disease.

Several randomized controlled trials (RCTs), such as the LORD, COMET (NCT02926911) and LORIS trials, are currently investigating the feasibility and non-inferiority of active surveillance with or without endocrine therapy for managing low-risk DCIS. These trials aim to

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evaluate the oncologic safety of close surveillance for low-risk DCIS, comparing to the conventional surgical treatment; However, patient's perception and acceptance and of surveillance as the treatment DCIS remains unknown. In fact, LORD and LORIS trials have accrued poorly. The slow accrual in LORD and LORIS frames the importance of the question of patient perspective.

This study aims to evaluate the patient perception on surveillance treatment for DCIS.

## Methods

Institutional board review (IRB) approval was obtained for patient data collection (IRB Number: UW-09-045, Hong Kong Hospital Authority). The study was performed in line with Declaration of Helsinki. This is a prospective cohort study on 1000 consecutive patients attending breast clinic since 1st July 2019. Inclusion criteria include women aged 18 to 90 years old with various breast disorders; Non-communicable patients or patients with mental conditions were excluded. Informed consent was obtained in the clinic. Interviews were conducted in-person, by two breast surgeons in breast surgery specialist outpatient clinic.

Basic patient information (age, gender, education background and past medical history) was collected by a standardized questionnaire, followed by explanation of the clinical scenario using a standard template. A standardized questionnaire was used and all interviews were completed by two interviewers (breast surgeons), with identical wordings, at outpatient consultation, to minimize variations in the language / phrases used during the interview. Patients were asked to answer hypothetical questions based on the scenario that if active surveillance is proven to be oncologically safe when compared to active surgical treatment (and radiotherapy) by the ongoing trials.

Patients were then interviewed on their perception on active surveillance for low risk DCIS. Two questions were asked: 1. What will be your choice of treatment of DCIS provided that active surveillance is proven to be oncologically safe when compared to active surgical treatment (and radiotherapy) by the ongoing trials; 2. What is the reason for your treatment decision?

## Results

1000 consecutive outpatients were recruited from the breast surgery specialist clinic. There was no male breast cancer in this cohort. Median age was 55 years old (Range 18 – 87). 692 patients had past history of breast cancer, while 279 patients had past history of benign breast conditions such as fibroadenoma or breast cysts, 27 patients had past history atypical ductal hyperplasia and intraductal papilloma with or without atypia, 2 patients had past history of malignant phyllodes tumor. Other baseline demographic data were summarized in Table 1.

Concerning the hypothetical question on the choice of treatment of DCIS, 109 (10.9%) patients opted for conservative (non-surgical) treatment, in which 18 (16.5%) patients decided for conservative treatment due to cosmetic concerns over surgical excision, 90 (82.6%) patients expressed the wish of avoiding surgical complications or anesthetic risks, while 1 (0.9%) patient would like to consider operation only when the DCIS progresses and become invasive.

891 (89.1%) patients opted for standard surgical excision for low-risk DCIS, in which 122 (13.7%) patients expressed the wish to avoid intensive surveillance breast imaging for the untreated DCIS, 12 (1.3%) patients believe that breast conserving surgery is not invasive and is cosmetically acceptable, 757 (85.0%) decided for operative management for DCIS to avoid life-time anxiety of disease progression.

Among the 109 patients who decided for conservative treatment for DCIS, 62 (56.9%) patients had history of benign breast lesions, 47 (43.1%) patients had history of malignant breast conditions (including 1 malignant phyllodes tumor and 46 breast cancers). The median age was 50 (Range 22 – 87).

**Table 1**  
Baseline patient demographic data.

Demographic feature		Number (%)
Education background	Primary	178 (17.8%)
	Secondary	578 (57.8%)
	Tertiary or above	244 (24.4%)
Previous history of breast disease	Benign	279 (27.9%)
	Breast cancer	692 (69.2%)
	Premalignant	27 (2.7%)
Family history of breast cancer	Malignant phyllodes	2 (0.2%)
	Positive	49 (4.9%)
Previous breast cancer stage (692 patients with 726 cancers)	Negative	951 (95.1%)
	DCIS	112 (15.4%)
	Stage 1	262 (36.1%)
	Stage 2	147 (20.2%)
	Stage 3	153 (21.1%)
Previous treatment for breast cancer (692 patients with 726 cancers)	Stage 4	52 (7.2%)
	Mastectomy	531 (73.1%)
	Lumpectomy	174 (24.0%)
	No operation	21 (2.9%)
History of breast reconstruction after cancer surgery (692 patients with 726 cancers)	No reconstruction	622 (85.7%)
	TRAM flap	61 (8.4%)
	LD flap	37 (5.1%)
	DIEP flap	2 (0.3%)
	Implant	4 (0.5%)
Previous treatment for benign breast lesions (279 patients)	Excision	28 (10.0%)
	HIFU / ablation	25 (9.0%)
	No operation	226 (81.0%)

Among the 891 patients who decided for surgical treatment for DCIS, 217 (24.4%) patients had history of benign lesions, 647 (72.6%) patients had history of malignant breast conditions (including 1 malignant phyllodes tumor and 646 breast cancers), 27 (3%) patients had premalignant conditions (including atypical ductal hyperplasia and intraductal papilloma). The median age was 55 (Range 18 – 86). Patients of older age and with history of malignant breast conditions are more likely to choose surgical treatment for DCIS ( $p < 0.0001$ ) (Table 2).

Of note, 112 (11.2%) patients had history of DCIS with excision performed in this cohort, 111 (99.1%) patients would still decide for surgical excision as the treatment of DCIS. Only 1 patient expressed the wish for conservative treatment for DCIS.

## Discussion

The common aim of the recent ongoing clinical trials (LORIS, LORD and COMET), studying feasibility of active surveillance in low-risk DCIS is to avoid surgical treatment of indolent lesions that may never progress into invasive cancer [8,9]. Assuming oncological safety, women in this study were hypothetically offered regular mammographic surveillance as opposed to lumpectomy followed by radiotherapy. With this option, general anesthetic risks, scars, cosmetic issues, and irradiation side effects can be avoided.

In fact, treatment regret after initial treatment decision for breast cancer has been studied by Fernandes-Taylor and Bloom in a study on 449 patients. 42.5% percent regretted in some aspect of the treatment, of which more than half regretted surgery [10]. This study aims to evaluate

**Table 2**  
Comparing patient demographics between surgical / non-surgical groups.

Factors		Number of patients choosing for conservative treatment N = 109	Number of patients choosing for surgical treatment N = 891	p-value
Age	<50	50 (45.9%)	243 (27.3%)	< 0.0001
	≥50	59 (54.1%)	648 (72.7%)	
History of malignant breast condition (including malignant phyllodes tumor)	Yes	47 (43.1%)	647 (72.6)	<0.0001
	No	62 (56.9%)	244 (27.4)	
History of DCIS vs. invasive cancer	DCIS	1 (2.2%)	111 (17.2%)	0.0034
	Invasive	45 (97.8%)	535 (82.8%)	
Family history of breast cancer	Yes	5 (4.6%)	44 (4.9%)	0.8727
	No	104 (95.4%)	847 (95.1%)	

patients' perception towards non-surgical treatment for DCIS.

However, only 10.9% women in our study opted for "active surveillance". Majority of these women viewed surgery as "traumatic" to the body, while others would like to avoid general anesthesia. Cosmesis was not a major concern to these women. Amongst this group who opted to watch-and-wait, the majority were women who themselves had benign breast disorders only. This association is explained by the fact that women with benign disease (eg. cysts and fibroadenomas) tend to be younger and more mindful of cosmetic outcomes. Conversely, patients with a history of breast cancer tended to choose surgery over surveillance. A few reasons behind this include increased awareness of the carcinoma sequence, and positive experience with previous breast surgery lending women confidence towards surgical approach.

Of the majority of women (89.1%) who opted for surgery, the universal driving force was – anxiety. Despite good prognosis, DCIS patients have always been labeled with "cancer" due to the inherent disease nomenclature [11]. They are traditionally offered treatment equivalent to that for invasive breast cancer, and more importantly, suffer psychosocial distress similar to that of cancer patients. Most women cannot accept the idea of living with "cancer." They worry about progression and metastasis [12]. Studies have shown that many women fail to understand the non-invasive nature of DCIS, leading to overestimations of risk of progression, which is associated with greater anxiety [11]. However, we observed that even amongst those who were already treated for DCIS, the majority of them would still decide for surgical excision over conservative treatment. This is a special subgroup in this study as these patients have experienced the treatment of DCIS personally. It is likely that they have better understanding of the disease than other patients.

13.7% patients decided for surgical treatment of DCIS to avoid extensive breast imaging surveillance for the untreated DCIS. This is explainable as breast imagings come with cost, time and psychological consequences (mainly anxiety).

Given that the low acceptance rate for DCIS surveillance is primarily due patient anxiety, the most important issue to address is doctor-patient communication. Doctor's perception towards DCIS is equally important as it can potentially influence patient decision [13], from the clinicians' standpoint, the biology of DCIS should be better understood and the continuum to cancer development should be adequately explained. Often, it is the paucity of disease knowledge and prognostic uncertainties that causes emotional stress to patients [14,15]. The on-going clinical trials might give us affirmative answers as if conservative treatment for DCIS is oncologically safe, however, other factors will need to be considered while selecting the best treatment for low risk

DCIS patients - for example, psychological burden of patients, as well of cost and time of extensive breast imaging surveillance that our patients expressed in this study. The risk perceptions of women should be assessed and taken into account of the decision [16]. Oncologically safety is indeed the major concern if a more conservative approach is to be adapted. However, patients' personal perceptions and acceptance should be taken into account and a multidisciplinary approach should be taken as well. Management of DCIS should be a conjoint discussion with the patient.

## Conclusion

Majority of patients decided for surgical treatment for DCIS even if conservative treatment is proven oncologically safe. Patient anxiety and cost of extensive breast surveillance are two important factors affecting this decision.

## Disclaimers

All authors report no conflict of interests

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## CRedit authorship contribution statement

**Michael Co:** Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Validation, Writing - original draft. **Andrea Lee:** Data curation, Formal analysis, Writing - original draft. **Ava Kwong:** Conceptualization, Data curation, Writing - review & editing, Supervision.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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