Ductal carcinoma in situ of breast: detection and treatment pattern in Hong Kong

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ABSTRACT

Introduction: The treatment of ductal carcinoma in situ has been widely reported in the western and other Asian countries, but the relevant data in Hong Kong are relatively limited. This study aimed to evaluate the latest detection and treatment pattern for ductal carcinoma in situ in Hong Kong so as to guide planning of future service provision.

Methods: This was a retrospective case series study. A total of 573 patients who registered with the Hong Kong Breast Cancer Registry, and were diagnosed and treated in Hong Kong from January 2001 to December 2011 were reviewed.

Results: Compared with invasive breast cancer patients, patients with ductal carcinoma in situ were younger (median, 48.6 vs 50.3 years; P<0.001), had a higher education level (P<0.001), had a higher total monthly family income (P<0.001), and had more common breast-screening habits (P<0.001). Significantly more patients with ductal carcinoma in situ underwent breast-conserving surgery than their invasive cancer counterparts (55.8% vs 36.7%; P<0.001). The percentage of screen-detected ductal carcinoma in situ was relatively lower than that reported in other studies, but was still much higher than that in invasive breast cancer patients (29.0% vs 4.7%; P<0.001). Screen-detected patients with ductal carcinoma in situ tended to choose a private hospital instead of a public hospital for treatment (P=0.05) and to undergo breast-conserving surgery (P=0.02). With a median follow-up of 3 years, the crude local recurrence rate after mastectomy and breast-conserving surgery was 0.4% and 3.3%, respectively; 44% of recurrent tumours had developed invasive components. No regional recurrence, distant recurrence, or cancer-related deaths were recorded.

Conclusions: In the absence of a population-based breast screening programme in Hong Kong, ductal carcinoma in situ is more frequently found in the higher social classes and managed in the private sector. The clinical outcome of ductal carcinoma in situ is excellent and more than half of the patients can be successfully managed with breast-conserving surgery.

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New knowledge added by this study
• This is the largest comprehensive study to evaluate the pattern of care for patients with ductal carcinoma in situ (DCIS) in Hong Kong.

Implications for clinical practice or policy
• Further studies are needed to evaluate the long-term clinical outcome of DCIS in Hong Kong.

Introduction

Ductal carcinoma in situ (DCIS) of the breast is a non-invasive, pre-cancerous lesion that was uncommon prior to the widespread use of mammography (MMG) screening; it is traditionally treated by mastectomy (MTX) with cure rates approaching 100%.[1] The high incidence rate and mortality rate of breast cancer in women[2] has led to the setting up of population-based breast cancer screening programmes by government in 34 countries.[3-6] One of the results of the popularity of breast screening is the rise in the detected incidence of DCIS.[7] Some western studies revealed that DCIS constituted approximately 10% to 40% of lesions detected by MMG screening.[8] In Asia, following the pilot Singapore Breast Screening Project, the diagnosis of DCIS also increased markedly.[9] Screen-detected DCIS showed a better clinical profile such as smaller size and higher chance of being treated by breast-conserving surgery (BCS).[9] Early detection of breast cancer at this stage offers the best opportunity for curative treatment.[10]

The treatment of DCIS has been widely studied and reported in the western and other Asian countries.[11-16] Although there have been no prospective randomised trials to compare MTX with BCS for DCIS, BCS has been widely accepted as an alternative treatment,[17] especially for small mammographically detected lesions. In Hong Kong, however, data on DCIS are relatively limited.

原位乳癌在香港的偵測和治療模式

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引言：原位乳癌的治療在西方和其他亞洲國家已進行廣泛研究，香港的相關數據卻相對有限。本研究旨在評估原位乳癌在香港最新的檢測和治療模式，為未來服務計劃提供指引。

方法：本回顧性病例系列研究的對象是於香港乳癌資料庫內的女性患者。2001年1月至2011年12月期間共有573名患者被診斷並接受治療。

結果：與入侵性乳癌患者比較，患有原位乳癌的患者較年輕（年齡中位數為48.6歲比50.3歲；P<0.001）、有較高教育水平（P<0.001）、有較高家庭總收入（P<0.001）和較高進行乳房檢查習慣率（P<0.001）。此外，她們接受乳房保留手術的比例較高（55.8%比36.7%；P<0.001）。雖然從篩檢中得悉患有原位乳癌的比率與其他研究比較相對低，但仍然較入侵性乳癌患者為高（29.0%比4.7%；P<0.001）。從篩檢中得悉患有原位乳癌的患者較傾向選擇私家醫院而非公立醫院作治療（P=0.05），且較多接受乳房保留手術（P=0.02）。跟進期中位數為3年的結果顯示，乳房切除術後局部區域性復發率為0.4%，而乳房保留手術復發率則為3.3%。有44%的復發腫瘤發展為入侵性乳癌。研究結果並無局部復發、遠端復發或與癌症相關的死亡病例。

結論：香港沒有以人口為基礎的乳癌篩查計劃，原位乳癌較易發現於較高社會階層的人口，亦有較多患者於私家醫院作治療。原位乳癌的臨床結果極佳，而且超過一半患者可通過乳房保留手術成功治療。

The Hong Kong Cancer Registry has only started to release basic data of annual incidence and age distribution of DCIS since 2009. In 2012, 3508 women in Hong Kong were diagnosed with invasive breast cancer and 477 women were diagnosed with DCIS[18] that constituted only 12.0% of the total number of breast cancer patients diagnosed. This incidence of DCIS was relatively low compared with the 20.7% in the United States.[14] Since our presentation and treatment pattern of DCIS are likely different to that in other countries, it is necessary to examine the particular pattern of care of DCIS in Hong Kong to better understand this disease.

The aim of this study was to evaluate the latest detection and treatment pattern for DCIS in Hong Kong so as to guide planning of future service provision.

Methods

The Hong Kong Breast Cancer Registry (HKBCR) was first established in 2007 by the Hong Kong Breast Cancer Foundation as a data collection and monitoring system for breast cancer in Hong Kong. The HKBCR aims to collect and analyse data from all Hong Kong breast cancer patients to obtain comprehensive information about demographics, risk exposures, treatments, clinical outcomes, and psychosocial impact on patients. It is the first population-wide, cancer-specific registry for breast cancer patients in Hong Kong and has been a member of the International Association of Cancer Registries since 2011, providing international standard data management and accuracy.

Between 2008 and 2011, a total of 5393 patients with a history of in-situ or invasive breast cancers were registered with the HKBCR on a voluntary basis. Of these patients, 2539 (47.1%) and 2854 (52.9%) were recruited from private clinics or hospitals and public hospitals, respectively. Demographics and risk exposure data were collected from these patients by questionnaire; clinical characteristics, detection methods, diagnostic methods, disease stage, histopathological profile, treatment modalities, and clinical outcome data were extracted from their medical records.[19] Data analysis was carried out in December 2014.

Inclusion criteria for this study were as follows: female patient being diagnosed and treated in Hong Kong from January 2001 to December 2011; pure DCIS with no invasive element in ipsilateral or contralateral breast at the time of diagnosis; definitive surgery performed; complete pathology details available; if axillary node sampling/dissection was performed, the nodal status must be negative; and no prior neoadjuvant treatment administered. Overall, 573 patients, including 16 synchronous patients with bilateral DCIS, from the HKBCR fulfilled the above criteria for further study.

For comparison purposes, the records of female patients with invasive breast cancer diagnosed and treated in Hong Kong during the same period were also extracted from HKBCR. Altogether, 1611 invasive breast carcinoma patients with 20 synchronous bilateral patients were retrieved for data analysis.

In this study, local recurrence was defined as the reappearance of cancer, invasive or non-invasive, in the treated breast or chest wall before or at the time of regional or distant metastases. All events were measured from the date of the definitive surgery. Descriptive statistics were used to describe the patterns of demographic and pathological features. Statistical significance was tested using Chi squared tests for categorical variables. The Kaplan-Meier method was applied to analyse the local recurrence estimation. All statistical tests were two-sided and performed at the 0.05 level of significance (P value). The Statistical Package for the Social Sciences (Windows version 19.0; SPSS Inc, Chicago [IL], US) was used for all statistical analyses.

The project was approved by respective Institutional Review Board and Ethics Committee of the following hospitals: Hong Kong Sanatorium & Hospital, Hong Kong Baptist Hospital, Hong Kong Adventist Hospital, Princess Margaret Hospital, United Christian Hospital, Prince of Wales Hospital, Queen Mary Hospital, Pamela Youde Nethersole Eastern Hospital, Pok Oi Hospital, North District

Hospital, Tuen Mun Hospital, and Yan Chai Hospital. All participants provided written informed consent.

Results

Of the 573 patients with DCIS of breast, the majority (74.9%) were diagnosed and treated between 2006 and 2011. A similar distribution was found in the 1611 patients with invasive breast cancer.

Table 1 compares the demographic characteristics of DCIS and invasive breast cancer patients. The results indicate that DCIS patients were significantly younger (median, 48.6 vs 50.3 years; P<0.001), had a higher education level (matriculation or above, 34.0% vs 15.0%; P<0.001), were more likely to be working (61.1% vs 55.8%; P<0.001), and had a higher total monthly family income of HK$30 000 or above (32.6% vs 16.6%; P<0.001). More DCIS patients had regular breast screening habits in the form of self-examination (monthly: 23.6% vs 21.8%; P<0.001), clinical breast examination (yearly: 41.5% vs 27.3%; P<0.001), MMG screening (yearly: 24.1% vs 10.6%; P<0.001), and breast ultrasound screening (yearly: 20.9% vs 10.2%; P<0.001). Patients with DCIS had a much higher chance of being asymptomatic at diagnosis (ie screen-detected) than their invasive breast cancer counterparts (29.0% vs 4.7%; P<0.001). Significantly more DCIS patients underwent BCS than their invasive cancer counterparts (55.8% vs 36.7%; P<0.001). Among those treated by BCS, DCIS patients had a similar chance of receiving adjuvant radiotherapy as the invasive cancer patients (94.1% vs 93.8%). As expected, only very few (8.7%) DCIS patients required adjuvant radiotherapy after MTX. Although DCIS patients do not require systemic adjuvant therapy, some may be prescribed hormone therapy as chemoprevention. In our study, only a small percentage of DCIS patients received hormone therapy and the pattern was similar after BCS or MTX (19.4% after BCS and 17.0% after MTX; P<0.001).

Table 2 shows the patient demographics, and clinical and pathological characteristics of screen-detected (asymptomatic) and self-detected (symptomatic) DCIS in Hong Kong. There was no significant difference in the median age between these subgroups (49.1 vs 48.5 years; P=0.23). The screen-detected subgroup had a significantly higher education level (matriculation or above, 42.7% vs 29.6%; P=0.01), higher total monthly family income of HK$30 000 or above (45.7% vs 26.8%; P=0.01), and underwent more regular clinical breast examination (yearly: 49.4% vs 35.5%; P<0.001), MMG (every 2 years: 22.0% vs 7.0%; P<0.001), and breast ultrasound screening (every 2 years: 11.6% vs 3.4%; P<0.001).

Among the DCIS patients, 28.6% (164/573) were screen-detected: since MMG screening is not usually recommended in younger women, only 14.5% (11/76) of DCIS in patients aged below 40 years were screen-detected compared with 34.3% (148/431) in patients aged above 40 years. Irrespective of the type of presentation, two thirds or more of DCIS patients chose to have surgery at a private hospital and the screen-detected subgroup had an even higher tendency to do so (74.4% vs 65.6%; P=0.05). Although there was a trend of finding smaller lesions in the screen-detected subgroup, there was no significant difference between the two subgroups in tumour size (median: 1.6 cm vs 2.0 cm; P=0.14). Despite this finding, screen-detected DCIS patients had a higher chance of being treated by BCS than symptomatic patients (65.9% vs 51.4%; P=0.02) [Table 2].

Among 573 patients with DCIS, clinical outcome data were available for 487 patients only. With a median follow-up of 3.1 (range, 0.5-10.9) years, the early clinical outcome was very good and compatible with other series. The overall crude local recurrence rate in DCIS patients was 3.9% (19 in 487 patients) and, as expected, there was a significant difference between MTX and BCS patients (0.4% vs 3.3%) [Table 3]. Of the 18 patients with known pathology at recurrence, eight (44.4%) had developed invasive components. Of the 16 BCS patients, 11 (68.8%) underwent salvage MTX at recurrence. Overall, by 6 years, the projected local recurrence rates after BCS were similar for DCIS patients and invasive breast cancer patients (log rank, P=0.21; Fig). No regional recurrence, distant recurrence, or cancer-related death were observed in the DCIS patients.

Discussion

Ductal carcinoma in situ was relatively uncommon in western countries until the widespread use of mass breast screening. There is strong evidence that the recent rise in DCIS incidence is related to the popularity of breast screening. Since there is no government-funded breast screening programme in Hong Kong, our study showed that only 29.0% of the DCIS in Hong Kong was first detected by screening, significantly lower than the 80% screen-detected rate in DCIS of other studies.[20-24] Our data showed that these DCIS patients in general had a higher monthly family income and higher level of education than their invasive cancer counterparts and this may contribute to their higher acceptance of self-funded breast screening, higher breast cancer awareness, and hence better chance of detecting breast cancer at an early stage. Not surprisingly, the use of BCS was also significantly more popular in the DCIS patients compared with their invasive cancer counterparts (55.8% vs 36.7%; P<0.001). Our results were also consistent with a previous local study that reported the performance of opportunistic breast screening in local well women clinics and showed that breast screening could achieve a higher cancer detection rate and detect the cancer at an early stage.[25]

TABLE 1. Comparison of patient demographic features and clinical treatment between DCIS and invasive breast cancer patients

	No. (%) of patients*		P value†
	DCIS (n=573)	Invasive (n=1611)	
Age (years) at diagnosis			0.06
<40	79 (13.8)	177 (11.0)	
≥40	477 (83.2)	1399 (86.8)	
Not known	17 (3.0)	35 (2.2)	
Median (range)	48.6 (26.9-80.2)	50.3 (18.8-91.1)	<0.001
Marital status			0.03
Single	90 (15.7)	193 (12.0)	
Married	420 (73.3)	1229 (76.3)	
Others (divorced / widowed)	44 (7.7)	155 (9.6)	
Not known	19 (3.3)	34 (2.1)	
Education level			<0.001
Primary or below	112 (19.5)	529 (32.8)	
Secondary	244 (42.6)	795 (49.3)	
Matriculation or above	195 (34.0)	241 (15.0)	
Not known	22 (3.8)	46 (2.9)	
Work status			<0.001
Working	350 (61.1)	899 (55.8)	
Non-working (housewife, retired, etc)	182 (31.8)	655 (40.7)	
Not known	41 (7.2)	57 (3.5)	
Family history of breast cancer			0.05
1st Degree	62 (10.8)	146 (9.1)	
2nd Degree	31 (5.4)	60 (3.7)	
No family history	461 (80.5)	1377 (85.5)	
Not known	19 (3.3)	28 (1.7)	
Total monthly family income (HK$)			<0.001
<10 000	64 (11.2)	205 (12.7)	
10 000-29 999	131 (22.9)	453 (28.1)	
≥30 000	187 (32.6)	267 (16.6)	
Not known	191 (33.3)	686 (42.6)	
Breast screening habits			
Self-examination			<0.001
Never	143 (25.0)	683 (42.4)	
Occasional (less frequent than monthly)	248 (43.3)	515 (32.0)	
Monthly	135 (23.6)	352 (21.8)	
Not known	47 (8.2)	61 (3.8)	
Clinical examination			<0.001
Never	138 (24.1)	775 (48.1)	
Occasional (less frequent than every 2 years)	96 (16.8)	233 (14.5)	
Every 2 years	57 (9.9)	107 (6.6)	
Yearly	238 (41.5)	440 (27.3)	
Not known	44 (7.7)	56 (3.5)	

Abbreviations: DCIS = ductal carcinoma in situ; MMG = mammography; MRI = magnetic resonance imaging; USG = breast ultrasound screening
* Unless otherwise stated; because of rounding, not all percentages total 100
† Chi squared test

TABLE I. (cont'd)

	No. (%) of patients*		P value†
	DCIS (n=573)	Invasive (n=1611)	
Mammography screening			0.001
Never	236 (41.2)	1149 (71.3)	
Occasional (less frequent than every 2 years)	88 (15.4)	160 (9.9)	
Every 2 years	67 (11.7)	75 (4.7)	
Yearly	138 (24.1)	170 (10.6)	
Not known	44 (7.7)	57 (3.5)	
Ultrasound screening			<0.001
Never	246 (42.9)	1160 (72.0)	
Occasional (less frequent than every 2 years)	88 (15.4)	139 (8.6)	
Every 2 years	33 (5.8)	44 (2.7)	
Yearly	120 (20.9)	165 (10.2)	
Not known	86 (15.0)	103 (6.4)	
Presenting symptoms			<0.001
Asymptomatic	166 (29.0)	75 (4.7)	
Screening by MMG	136 (81.9)	25 (33.3)	
Screening by USG	25 (15.1)	13 (17.3)	
Screening by MRI	3 (1.8)	0	
Not known	2 (1.2)	37 (49.3)	
Symptomatic	380 (66.3)	1385 (86.0)	
Palpable breast mass	296 (77.9)	1339 (96.7)	
Nipple discharge	74 (19.5)	20 (1.4)	
Others (nipple retraction, pain)	29 (7.6)	72 (5.2)	
Not known	27 (4.7)	151 (9.4)	
Type of breast surgery			<0.001
Breast-conserving surgery	320 (55.8)	592 (36.7)	
With radiotherapy	301 (94.1)	555 (93.8)	
Without radiotherapy	11 (3.4)	29 (4.9)	
Radiotherapy not known	8 (2.5)	8 (1.4)	
Mastectomy	253 (44.2)	1019 (63.3)	
With radiotherapy	22 (8.7)	522 (51.2)	
Without radiotherapy	221 (87.4)	480 (47.1)	
Radiotherapy not known	10 (4.0)	17 (1.7)	

In contrast, the profile of screen-detected and self-detected (ie symptomatic) DCIS patients showed more similarities than differences. The overall tumour size was not significantly different between these subgroups, although lesions of >2 cm were less common in the screen-detected patients (34.8% vs 43.0%; P=0.12). Since there is no population-based breast screening programme in Hong Kong, these opportunistic breast screenings performed in various laboratories may have inherent limitations. Overseas studies have shown a considerably higher sensitivity in organised population-based screening than in opportunistic screening,[24] although a large-scale local self-referred breast screening centre reported comparable performance.[25]

Our study showed a high acceptance of BCS for management of DCIS in Hong Kong and nearly all (94.1%) BCS patients also underwent postoperative radiotherapy. Although prior randomised studies have demonstrated the benefit of postoperative radiotherapy in reducing both invasive and non-invasive recurrence of DCIS after BCS, much effort has been put into identifying a low-risk subgroup in whom postoperative radiotherapy can be safely omitted.[26] The Van Nuys prognostic index (VNPI)—a retrospectively derived risk classification that combines tumour size, margin width, and pathological classification—was developed to select this low-risk group.[27] Nonetheless, perhaps due to contradictory findings from other studies that reported a much higher local failure rate in the VNPI low-risk subgroup,[28] it is apparent that most clinicians in Hong Kong had reservations when applying the VNPI to their DCIS patients.

TABLE 2. Comparison of clinical and pathological characteristics of DCIS patients between screen-detected and self-detected methods

	No. (%) of patients*			P value‡
	Screen-detected (n=164)	Self-detected (n=358)	Total (n=522)†	
Age (years) at diagnosis				<0.001
<40	11 (6.7)	65 (18.2)	76 (14.6)	
≥40	148 (90.2)	283 (79.1)	431 (82.6)	
Not known	5 (3.0)	10 (2.8)	15 (2.9)	
Median (range)	49.1 (32.3-66.5)	48.5 (26.9-80.2)	48.6 (26.9-80.2)	0.23
Education level				0.01
Primary or below	21 (12.8)	81 (22.6)	102 (19.5)	
Secondary	68 (41.5)	156 (43.6)	224 (42.9)	
Matriculation or above	70 (42.7)	106 (29.6)	176 (33.7)	
Not known	5 (3.0)	15 (4.2)	20 (3.8)	
Total monthly family income (HK$)				0.01
<10 000	12 (7.3)	47 (13.1)	59 (11.3)	
10 000-29 999	43 (26.2)	76 (21.2)	119 (22.8)	
≥30 000	75 (45.7)	96 (26.8)	171 (32.8)	
Not known	34 (20.7)	139 (38.8)	173 (33.1)	
Breast screening habits				
Clinical examination				<0.001
Never	16 (9.8)	113 (31.6)	129 (24.7)	
Occasional (less frequent than every 2 years)	32 (19.5)	60 (16.8)	92 (17.6)	
Every 2 years	22 (13.4)	31 (8.7)	53 (10.2)	
Yearly	81 (49.4)	127 (35.5)	208 (39.8)	
Not known	13 (7.9)	27 (7.5)	40 (7.7)	
Mammography screening				<0.001
Never	45 (27.4)	174 (48.6)	219 (42.0)	
Occasional (less frequent than every 2 years)	33 (20.1)	52 (14.5)	85 (16.3)	
Every 2 years	36 (22.0)	25 (7.0)	61 (11.7)	
Yearly	41 (25.0)	75 (20.9)	116 (22.2)	
Not known	9 (5.5)	32 (8.9)	41 (7.9)	
Ultrasound screening				<0.001
Never	56 (34.1)	171 (47.8)	227 (43.5)	
Occasional (less frequent than every 2 years)	35 (21.3)	47 (13.1)	82 (15.7)	
Every 2 years	19 (11.6)	12 (3.4)	31 (5.9)	
Yearly	32 (19.5)	71 (19.8)	103 (19.7)	
Not known	22 (13.4)	57 (15.9)	79 (15.1)	
Presenting symptoms				<0.001
Asymptomatic	164 (100.0)	0	164 (31.4)	
Symptomatic	0	357 (99.7)	357 (68.4)	
Not known	0	1 (0.3)	1 (0.2)	
Laterality				<0.001
Left	74 (45.1)	189 (52.8)	263 (50.4)	
Right	78 (47.6)	165 (46.1)	243 (46.6)	
Bilateral left / right (synchronous)	12 (7.3)	4 (1.1)	16 (3.1)	

Abbreviations: DCIS = ductal carcinoma in situ; ER = oestrogen receptor; PR = progesterone receptor
* Unless otherwise stated; because of rounding, not all percentages total 100
† Of the 573 patients in this study, only 522 had known data on detection method
‡ Chi squared test

TABLE 2. (cont'd)

	No. (%) of patients*			P value‡
	Screen-detected (n=164)	Self-detected (n=358)	Total (n=522)†	
Size of tumour (cm)				0.12
≤1.00	53 (32.3)	74 (20.7)	127 (24.3)	
1.01-2.00	45 (27.4)	103 (28.8)	148 (28.4)	
>2.00	57 (34.8)	154 (43.0)	211 (40.4)	
Not known	9 (5.5)	27 (7.5)	36 (6.9)	
Median (range)	1.6 (0.2-9.0)	2.0 (0.1-8.5)	1.9 (0.1-9.0)	0.14
Venue of definitive surgery				0.05
Private hospital	122 (74.4)	235 (65.6)	357 (68.4)	
Public hospital	42 (25.6)	123 (34.4)	165 (31.6)	
Type of surgery				0.02
Breast-conserving surgery	108 (65.9)	184 (51.4)	292 (55.9)	
Mastectomy	56 (34.1)	174 (48.6)	230 (44.1)	
Final resection margin status				0.06
Margin clear	84 (51.2)	179 (50.0)	263 (50.4)	
≤2 mm (margin clear)	15 (17.9)	46 (25.7)	61 (23.2)	
>2 mm (margin clear)	34 (40.5)	48 (26.8)	82 (31.2)	
Distance unknown	35 (41.7)	85 (47.5)	120 (45.6)	
Margin involved	6 (3.7)	8 (2.2)	14 (2.7)	
Not known	74 (45.1)	171 (47.8)	245 (46.9)	
ER or PR positive				0.39
No	26 (15.9)	60 (16.8)	86 (16.5)	
Yes	114 (69.5)	210 (58.7)	324 (62.1)	
Not known	24 (14.6)	88 (24.6)	112 (21.5)	

TABLE 3. Clinical outcome of patients with ductal carcinoma in situ (n=487)

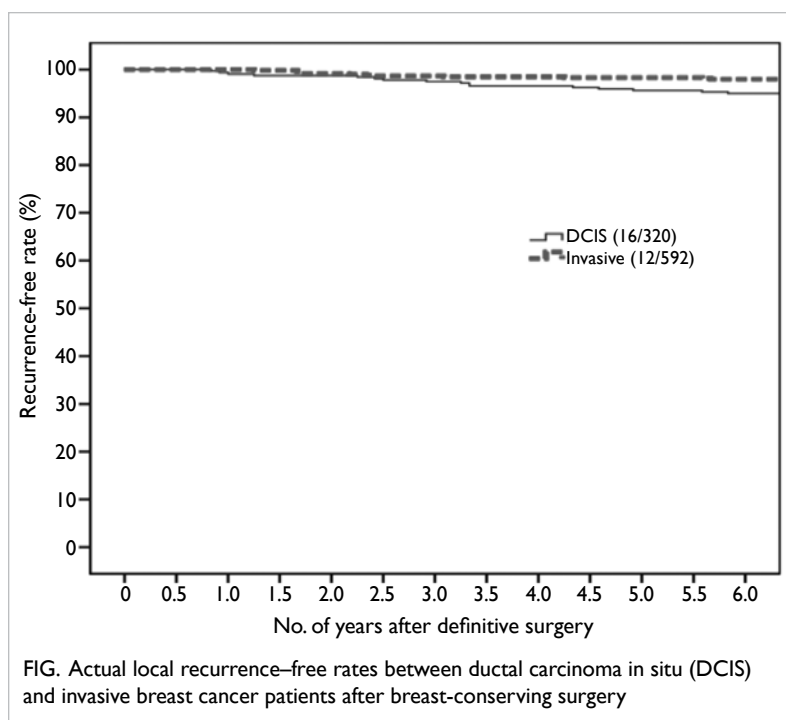| Clinical outcome	Data
Follow-up period (years)	
Mean	3.7
Median	3.1
Range	0.5-10.9
Local recurrence, No. (%)	
No	468 (96.1)
Yes	19 (3.9)
Breast (after breast-conserving surgery)	16 (3.3)
Chest wall (after mastectomy)	2 (0.4)
Not known	1 (0.2)

FIG. Actual local recurrence–free rates between ductal carcinoma in situ (DCIS) and invasive breast cancer patients after breast-conserving surgery

Although tamoxifen after local excision for DCIS has been shown to reduce the risk of recurrent DCIS in the ipsilateral breast (hazard ratio=0.75; 95% confidence interval [CI], 0.61-0.92) and contralateral breast (relative risk=0.50; 95% CI, 0.28-0.87)[29] and

TABLE 4. Comparison of the age of patients with ductal carcinoma in situ between Hong Kong Breast Cancer Registry (HKBCR) and Hong Kong Cancer Registry (HKCR) from 2009 to 2011

Age-group (years)	No. (%) of patients					
	2009		2010		2011	
	HKBCR	HKCR	HKBCR	HKCR	HKBCR	HKCR
≤39	7 (7.4)	37 (8.3)	6 (9.8)	35 (7.4)	2 (7.4)	37 (7.7)
40-44	20 (21.1)	56 (12.6)	8 (13.1)	68 (14.4)	5 (18.5)	66 (13.6)
45-49	22 (23.2)	102 (23.0)	11 (18.0)	110 (23.3)	4 (14.8)	103 (21.3)
50-54	17 (17.9)	69 (15.6)	17 (27.9)	89 (18.9)	7 (25.9)	84 (17.4)
55-59	15 (15.8)	54 (12.2)	12 (19.7)	49 (10.4)	6 (22.2)	69 (14.3)
60-64	6 (6.3)	38 (8.6)	4 (6.6)	41 (8.7)	2 (7.4)	42 (8.7)
65-69	5 (5.3)	25 (5.6)	1 (1.6)	23 (4.9)	1 (3.7)	30 (6.2)
70-74	1 (1.1)	21 (4.7)	0	17 (3.6)	0	22 (4.5)
≥75	2 (2.1)	41 (9.3)	2 (3.2)	40 (8.4)	0	31 (6.4)

over 60% of our patients had positive hormonal receptors, less than 20% DCIS patients in Hong Kong actually received tamoxifen as chemoprevention.[30] It is likely related to the concern about side-effects (particularly the small risk of endometrial cancer) and the lack of overall survival benefit as shown by the Cochrane systematic review and meta-analysis.[29] The lack of survival benefit is consistent with the clinical experience that most new lesions detected during follow-up surveillance are highly treatable.

As expected, the local recurrence rate after MTX was very low (0.4%) in these DCIS patients; it should be noted that 8.7% had received adjuvant radiotherapy, probably because of close resection margins. For DCIS patients treated by BCS, the crude local recurrence rate in our study was 3.3% (16 in 320 patients) and was quite similar to the long-term experience in another regional hospital (Pamela Youde Nethersole Eastern Hospital) in Hong Kong. In their analysis of 155 DCIS patients treated by BCS and radiotherapy, after a 10-year median follow-up, the crude local recurrence rate was 5.8% (unpublished data of Pamela Youde Nethersole Eastern Hospital). Our study did not capture the data on the mode of detection of local recurrences but another local study reported that only 43% of in-breast recurrences could be first detected by surveillance breast imaging; the rest presented with either nipple discharge or a palpable mass.[30] Hence, patients should be advised not to become overly dependent on breast imaging to detect early recurrences. Although there were no cancer-related deaths in these DCIS patients, 44% of local recurrences in this study contained invasive components that may still necessitate systemic treatment in addition to further salvage surgery.

This study provides the first comprehensive analysis of the pattern of care of DCIS in Hong Kong. The strength of this analysis is the comprehensiveness compared with other cancer registries in data collection on epidemiological, pathological, and treatment characteristics for breast cancer. Nonetheless, data from HKBCR might not be representative of all breast cancers in Hong Kong since a higher proportion of patients were recruited from private hospitals or clinics than public hospitals in Hong Kong. Since the data collection was done on a voluntary basis and only started in 2008, some clinical outcome data may be missing (approximately 10% of DCIS patients) and the follow-up duration remains relatively short, and may not represent the whole local population. There was also a high proportion of missing data for family income in the two internal comparisons. Although the distribution of age at diagnosis in our study did not deviate too far from that reported in the Hong Kong Cancer Registry (a population-based registry; Table 4), older age-groups, especially those aged 70 years and above, were under-represented in the present study. Furthermore, we did not have information on education, occupation, and family income to enable comparison of socio-economic backgrounds.

Conclusions

Ductal carcinoma in situ in Hong Kong appears to be a more prevalent disease in the higher social classes with a tendency to be managed in the private sector. More than half of DCIS patients can be successfully treated with BCS and the early outcome is excellent and comparable with overseas studies.[9,16] Further studies are needed to examine the long-term clinical outcome of DCIS in Hong Kong.

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Declaration

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