RESEARCH ARTICLE

Two Decades of Experience with Ductal Carcinoma in Situ of the Breast in the Cancer Institute of Tehran, Iran

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Abstract

Background: Breast cancer screening and higher quality mammography have resulted in an increase in the diagnosis of ductal carcinoma in situ worldwide. We compared the incidence and other factors in our cases of ductal carcinoma in situ between two recent decades. Materials and Methods: Medical records of cases of ductal carcinoma in situ who had been admitted to the surgery wards of the Cancer Institute of Tehran, Iran were evaluated from March 1993 to March 2003 as phase 1, and from April 2003 to April 2013 as phase 2. Results: Ratio of ductal carcinoma in situ to overall breast cancer was 1.27 and 3.93 in phases 1 and 2, respectively. Rates of excisional or incisional biopsies versus core needle biopsies and clinically versus mammographically detected cases as well as median size of tumors dropped between the 2 phases while a substantial rise in the number of patients attending for screening was seen in this time period. Surgical treatments followed a trend from modified radical mastectomy and axillary lymphatic dissection toward breast conserving surgery and sentinel node dissection or no axillary intervention. Conclusions: Our study shows a considerable trend toward earlier detection of breast cancer and evolution of treatment strategies toward standard less invasive surgery of DCIS in Iran.

Keywords: Breast carcinoma - ductal carcinoma *in situ* - epidemiology - screening - Iran

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Introduction

Screening of breast cancer has caused early detection of breast cancer in areas of the world where it is formally carried out. As well, higher quality imaging has helped in detection of earlier stage disease and precancerous lesions. *In situ* breast cancers, classified into lobular carcinoma *in situ* (LCIS) and ductal carcinoma *in situ* (DCIS), are now mostly identified as imaging abnormalities (Sorum et al., 2010; Patani et al., 2011).

Screening, although not performed formally and on a regular basis in most areas of the world, is nevertheless undertaken as opportunistic screening in many areas. In Iran, because of recent increase in public awareness, demand for screening mammography is increasing. In addition, many centers have been equipped with digitalized mammography devices. In order to compare the prevalence of DCIS after the launching of digitalized equipment and establishment of the breast clinic in our institute, we compared our cases of DCIS between two recent decades.

Materials and Methods

Medical records of patients who had been admitted in the surgery wards of the Cancer Institute of Tehran, Iran as a community referral center in the recent 20 years were evaluated in 2 phases: from March 1993 to March 2003 as phase 1, and from April 2003 to April 2013 as phase 2. Among those with the histologic diagnosis of breast malignancy, tumors diagnosed as ductal carcinoma *in situ* were selected. Data regarding demographic characteristics of the patients as well as their family history, menstrual, and pregnancy history, clinical and radiological presentation, method of diagnosis and histologic and immunohistochemistric features of the tumors were extracted from the records and filled in the designed questionnaires. Missing data were recorded as such; results of the 2 phases were compared.

Results

Between March 1993 to April 2013, 123 cases of DCIS were diagnosed among 4361 cases of breast cancer (2.82%). Twenty-three cases of DCIS out of 1815 belonged to phase 1 of the study, whereas the figures were 100 and 2546 for DCIS and all breast cancers in phase 2, respectively.

The median age of the patients in phase 1 was 50.08 years (range 23-71 yr) and 50.4 years (range 28-73 yr) in

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Table 1. Patient and Tumor Features in Phases 1 and 2 of the Study

Variables		1993-2003 N= 23		2003-2013 N=100	
		n	%*	n	%*
Chief complaint**	Screening	0	0	20	24.1
	Mammographic finding	1	4.3	3	3.6
	Breast mass	13	56.6	37	44.6
	Skin/nipple change	5	21.7	6	7.2
	BND[a]	3	13	10	12
	Breast pain	1	4.3	7	8.4
	Missing	0	-	17	-
FH	Positive	1	4.3	7	13.2
	Negative	22	95.7	46	86.8
	Missing	0	-	47	-
Mammography	Not performed	7	30.4	3	5.6
	No finding‖	9	39.1	1	1.9
	Density or mass	4	17.4	36	67.9
	Microcalcification[b]	3	13	12	22.6
	Tissue distortion	0	0	4	7.6
	Missing	0	-	47	-
Ultrasonography	Not performed	23	100	12	24.4
	No finding	0	0	3	7.3
	Suspicious	0	0	16	39
	Indeterminate	0	0	10	29.3
	Missing	0	0	59	-
Method of diagnosis	FNA	0	0	2	2.5
	Core needle biopsy	0	0	37	45.7
	Vacuum biopsy	0	0	5	6.2
	Incisional biopsy	3	13	8	9.9
	Excisional biopsy	20	87	29	35.8
	Missing	0	-	19	-
Type of breast and axillary surgery					
	BCS(+/-O) and no Ax	1	4.3	23	28
	BCS(+/-O) and SLN	0	0	16	19.5
	BCS(+/-O) and AD	8	34.8	6	7.3
	MAST and no Ax	3	13	3	3.7
	MAST and SLN	0	0	16	19.5
	MAST and AD	11	47.8	19	23.2
	Missing	0	-	18	-
Margins of resection	Negative	23	100	69	93.2
	Cose	0	0	1	1.4
	Positive	0	0	4	5.4
	Missing	0	-	26	-
Histologic subtype[c]	Comedo	10	62.5	42	51.2
	Papillary	2	12.5	6	7.3
	Cribriform	4	25	18	22
	Solid	0	0	20	24.4
	Missing	9	-	18	-
Grade	1 (low)	2	20	35	64.8
	2 (intermediate)	5	50	10	18.5
	3 (high)	3	30	9	16.7
	Missing	13	-	46	-
ER	Positive	6	42.9	27	57.4
	Negative	8	57.1	20	42.6
	Missing	9	-	53	-
PR	Positive	5	35.7	26	55.3
	Negative	9	64.3	21	44.7
	Missing	9	-	53	-

*Percents without considering missing data; **in patients with several complaints, the most prominent has been considered; [a]BND=bloody nipple discharge, ‖ these were clinically positive (mass in exam); [b]suspicious or indeterminate; [c]because in mixed patterns, each pattern has been considered separately in the count; the percent sum with missing cases is more than 100% in this field

phase 2. The median size of the tumors at presentation was 3.34 centimeters (cm) (range 0.5 8 cm) and 2.1 cm (range 0.4-11 cm) in phases 1 and 2 respectively. Microinvasion was detected in 3 of the 23 cases of the first decade and 11 of the 100 cases in the second decade. One of the patients in phase 2 had DCIS and LCIS both in one breast and another one had DCIS and an intraductal papilloma together, 2 others had Paget disease of the nipple in combination with DCIS of the underlying breast parenchyma. Other investigated characteristics of patients in each phase are demonstrated in Table 1.There were 100 patients in phase 2 and, the percent of each variable will be the same figure as the number (for example 10% if the number was 10); we have not displayed these in the table but the percents without considering missing data are demonstrated.

Discussion

Breast cancer is the most common female cancer worldwide. Epidemiology of the disease has undergone several changes in recent years. In western countries, an increase in the incidence of breast cancer from 1970s to 2004 has been followed by a decrease in subsequent years.(Hunt, 2010) Nevertheless, *in situ* cancers have not followed the same course in these countries. Ductal carcinoma *in situ* (DCIS), which constitutes more than 80% of *in situ* breast cancers (Lee et al., 2012; Siziopikou, 2013), comprises more than 20% of screen-detected cancers today, showing a four-fold increase in the 30 recent years in the developed parts of the world (Patani et al., 2011; Fortunato et al., 2012; Lambert et al., 2012; Lee et al., 2012; Siziopikou, 2013). The incidence has increased 3.9% each year from 1973 to 1985, and then 15% annually till 2008 (Fortunato et al., 2012). This rising curve continues in women younger than 50 years of age while figures are declining in older patients (Siziopikou, 2013). Recent increase in DCIS is mostly due to screening protocols in developed countries (Estevez et al., 2010; Sorum et al., 2010; Patani et al., 2011; Bleyer and Welch, 2012; Choi and Van Zee, 2012; Lambert et al., 2012; Lee et al., 2012). The development of higher quality images such as digital mammography as an alternative to analogue imaging has also positively affected this rising trend (Patani et al., 2011; Lambert et al., 2012; Schmale et al., 2012).

Like its invasive counterpart, DCIS incidence varies in women according to age. It is seen rarely in ages below 30 and infrequently below 40 years, then rises rapidly from 40 to 50 years and slowly after 50, reaching a plateau after 60 years of age (Sacchini et al., 2012).

However, these patterns of incidence are somewhat different in Asian countries. There is a variation of up to 10-folds in breast cancer incidence in different parts of the world, with a much lower incidence in developing areas, (Tfayli et al., 2010) and accordingly in the majority of Asian countries. The highest worldwide incidence for breast cancer has been seen in North America (Jemal et al., 2009) and Western Europe while mediteranean countries and South America harbor an intermediate incidence of the disease. The lowest figures are seen in Asia, mostly in the southern and southeast areas (Parkin et al., 2005). On the other side, in contrast with the western world, the overall incidence of breast cancer is following a rising trend in less developed areas, (Shibuya et al., 2002) and more than half of the world cases of breast cancer occur

at present in developing countries (Shulman et al., 2010; Tfayli et al., 2010).

In regard to DCIS, figures vary according to overall cancer frequency in each region and to the rate of early detection. In 1973, MacMahon et al compared incidence rates of breast cancer in Tokyo, Japan and Boston, England and showed that DCIS was more common in Tokyo and invasive disease more common in Boston (MacMahon et al., 1973). In 1992, Chua et al showed that in Singapore, between 1988 and 1990, out of 707 cases of malignancy of the breast, 4.1% were in-situ lesions, and DCIS was seen 9 times more frequently than LCIS (Chua et al., 1992). In the study of Chan et al, more than 13,000 women aged 40-70 from Hong Kong were screened for breast cancer by clinical breast exam and mammography. They detected an overall incidence of nearly 0.5% for breast cancer, whereas about 24% of them were DCIS (Chan et al., 1998). Tan et al. (2000) disclosed a rate of 25% for DCIS in 135 breast cancers detected among more than 28000 women screened with mammography in Singapore (Tan et al., 2000). In another study, Tan et al reviewed 38 cases of DCIS and compared them in terms of frequency and other characteristics with the study carried out a decade sooner. They detected an increasing proportion of DCIS in regard to all breast cancers. They also found a younger age for DCIS in Asian women in comparison with their American counterparts (Tan et al., 2002a). In their review article in 2002, Ikeda et al mentioned that DCIS accounted for about 7% of all breast cancers in Japan (Ikeda et al., 2002). In 2003, Wang et al. (2003) mentioned that mammographic screening had caused a decrease in size and stage of breast cancer in Singaporean women while obviously increasing the proportion of DCIS in relation to all breast cancers; this cancer is the leading cause of female death in that country (Wang, 2003). In 2005, Kayani and Bhurgri (2005) retrospectively studied the frequency of DCIS in a 6-year period based on the data of a large pathology series in Karachi, Pakistan. DCIS constituted 1% of all breast cancers with a mean age of nearly 49 years (Kayani and Bhurgri, 2005). In 2006, Yeoh et al. (2006) revealed the results of the mammographic screening program from 2002 to 2004 in Singapore, where breast cancer is the most common female malignancy. They reported a nearly 30% rate of DCIS among all breast cancers (Yeoh et al., 2006). In 2006, Wu et al. (2006) reported the evolution of breast cancer screening program in Taiwan from 1995 to 2004: screening via breast exam, ultrasonography and mammography in first-degree relatives of breast cancer cases for 3 years, mass screening via only breast examination performed by nurses for the following 3 years, and a two-stage program consisting of risk assessment followed by mammography in moderate- to high-risk women for the last 3 years. In the time period of the study, DCIS and stage 1 invasive cancers constituted between 60 to more than 70% of all breast cancers (Wu et al., 2006). In 2007, Lui et al. (2007) analyzed results of opportunistic breast cancer screening in Hong Kong during a 5-year period (1998 to 2002); DCIS constituted 28% of all breast cancers (Lui et al., 2007). In 2007, Tuncbilek et al. (2007) analyzed results of 6858 screening mammographs performed during 1 year in Ankara, Turkey; they detected that half of breast cancers were DCIS or stage 1 cancers (Tuncbilek et al., 2007). In 2010, Jara-Lazaro et al. (2010) while stating that breast cancer constitutes nearly 30% of cancers in women in Singapore and that rates are increasing, report that in the on-going breast cancer screening program in Singapore, DCIS comprised more than 30% of breast cancers in pre-menopausal women (Jara-Lazaro et al., 2010) whereas in the same year, Atoum et al. (2010) reviewed 99 Jordanian women affected by breast cancer between 2000 and 2002 and reported only a 1% rate of DCIS (Atoum et al., 2010). In 2013, Aytac et al. (2013) reviewed pathological findings of 264 women of all ages who had undergone reduction mammoplasty between 2004 and 2009 in Bursa, Turkey. There were 2 cases of invasive ductal carcinoma and one case of DCIS (0.4% and 0.2%of all cases, respectively), all three in women above 50 years of age (Aytac et al., 2013).

Breast cancer is the most frequent cancer in women in Iran. A study by Harirchi et al. (2011) in 4 referral centers for breast cancer in Tehran, the capital of Iran, has shown that the proportion of early cases of breast cancer, including stage 0 (DCIS), has increased more than 4-fold from 1985 to 2005. As well, all *in situ* lesions had increased from 0.1% to 6.3% in this time period (Harirchi et al., 2011).

In our study, DCIS constituted 1.27% of all breast cancers between March1993 to March 2003, and 3.93% of them from April 2003 to April 2013. This shows a more than 4-fold increase in DCIS cases and a 3-fold increase in its proportion regarding overall breast cancer. This increase is most likely due to increased awareness of women and their demand for opportunistic screening, as well as more sophisticated technology including digitalized mammography and stereotactic biopsy. Size of tumors showed 37.12% reduction between the 2 phases (from 3.34 cm to 2.1 cm median size). The age range of our patients had not significantly changed meanwhile.

DCIS is composed of a proliferation of malignant cells in ducts without invasion of the basement membrane. (Estevez et al., 2010; Leeper and Dixon, 2011; Choi and Van Zee, 2012; Lee et al., 2012) Actually, this entity is identified as a premalignant lesion which progress frequently, but not invariably, to invasive disease (Leeper and Dixon, 2011; Patani et al., 2011). DCIS has been categorized classically into several histologic subtypes based on its architecture pattern, mainly noncomedo and comedo subtypes, the former further subdivided into cribriform, solid and papillary forms. Comedo lesions are frequently associated with poor prognostic characteristics like high-grade cytology, negative estrogen receptor, positive HER2, high proliferative rates and foci of microinvasion. On the other side, data regarding nuclear grade is one of the most important features of these tumors and the 2009 College of American Pathologists-American Society for Clinical Oncology introduced a classification based upon the amount of atypia of nuclei, described as grades 1 to 3 (Scripcaru and Zardawi, 2012; Siziopikou, 2013). According to this, DCIS comprises a spectrum from low-grade DCIS to high-grade disease with microinvasion (Badruddoja, 2012; Lee et al., 2012). Although DCIS is considered non- invasive, invasive components sometimes

are detected in the lesion, recognized as DCIS with microinvasion when the invasive component is less than 1 millimeters in its largest diameter (Pimiento et al., 2011); these are unusual in lesions smaller than 2.5 cm (Siziopikou, 2013) and constitute 10-20% of all cases (Zhang et al., 2012). Transformation of *in situ* ductal lesions to invasive forms occurs more frequently and sooner in high grade and comedo lesions, local invasive recurrence is also more common in these (Estevez et al., 2010; Sorum et al., 2010; Patani et al., 2011).

The study of Tan et al in 2000 in Singapore showed a predominance of comedo subtypes in their cases of DCIS (Tan et al., 2000). In the study of Kayani and Bhurgri (2005) in Pakistan, non-comedo subtypes constituted the majority. Less than one third of the 38 DCIS had been assessed regarding hormone receptor status, and these were positive in the majority (Kayani and Bhurgri, 2005). Tan et al. (2002b) reviewed histologies and immunohistochemistries of 102 cases of DCIS in Chinese Singaporean women in 2002. They detected a rate of positivity of around 75% for ER and HER2 receptors and around 50% PR (Tan et al., 2002b).

In our study, pathologists had mostly depicted the lesions according to their histologic subtype rather than their grade; the most common subtype was comedo in both decades. Around 13% and 11% of all cases of DCIS in phases 1 and 2 of our study harbored microinvasion, respectively.

More than 20 years ago, cases of DCIS presented mainly as palpable lumps, abnormal nipple discharge or even as an incidental finding in pathologic reports of breast lesion biopsies. Nevertheless, DCIS is now mainly detected as asymptomatic mammographic microcalcifications (Patani et al., 2011; Lambert et al., 2012) and as low as 10% of cases have a clinical presentation as breast mass in western countries, (Lee et al., 2012) or seldom present as bloody nipple discharge, often associated with Paget disease of the nipple (Siziopikou, 2013). With recent technologic advances in imaging, ultrasonography (US) can evaluate the presence of changes in favor of invasive components. Lesions without calcification may appear as microlobulated hypoechoic masses without posterior acoustic features in US, or may simulate patches of microcyst aggregation; these are non-specific and act as an adjunct to pre-diagnosis work up (Wang et al., 2013). Izumori et al. (2010) estimated imaging findings in their cases of DCIS and demonstrated cystic or solid lesions in US in 79% of patients (Izumori et al., 2010). US also can evaluate the pathological size of cases of DCIS without calcification (Mun et al., 2013).

Results of the analysis of Chua et al. (1992) from Singapore showed that the most common presentation of DCIS cases in their study was symptoms as breast mass and nipple discharge, whereas tumor size was more than 2 cm in more than half the cases (Chua et al., 1992) In the same country, Tan et al. (2000) found out that imaging findings consisted of calcifications in the majority of cases, and breast mass in others (Tan et al., 2000). Another study by Tan et al. (2003) showed a higher rate of early detection seen as more cases detected via mammography and smaller lesion (Tan et al., 2002a). More than 90% of Pakistani cases of DCIS presented with a palpable breast mass and a very small minority were detected on mammography alone in the study of Kayani and Bhurgri (2005) while more than two-thirds of the 75 cases in the study of Yau et al. (2006) had palpable lesions. In the 170 cases of DCIS of the series of Chuwa et al. (2008) in Singapore, more than half the cases had presented with a palpable lump with a median size of 13 mm.

In our study, the most common presentation of DCIS in both stages was breast mass; however only one of the patients in phase 1 had attended the clinic because of mammographic findings while more than one fourth of those in phase 2 had presented with mammographic changes, consisting mostly of suspicious microcalcifications and tissue distortion in order of frequency. There was a substantial increase in the number of patients attending for screening without any breast complaint; from 0 to 20 cases (0%-20%) in phases 1 and 2, respectively. Ultrasonography had not been undertaken in the patients in phase 1; in phase 2, 29 cases (75.6% of patients) had undergone ultrasonography and this had showed suspicious changes and aided in the diagnostic work up in 26 (68.3% of all cases of DCIS, 89.7% of those undertaken).

Diagnosis of DCIS is mainly based on histologic exam of biopsy specimens obtained under imaging guidance by core needle biopsy or occasionally vacuum-assisted biopsy (Brennan et al., 2011; Badruddoja, 2012; Lambert et al., 2012; Lee et al., 2012); fine-needle aspiration is insufficient owing to the lack of tissue elements for judging invasion of the basement membrane. Nonetheless, diagnosis of cases of DCIS is still principally based on the clinical picture followed by histologic examination of biopsied or excised specimens in developing countries (Badruddoja, 2012).

In the first decade of our study, the only definitive diagnostic procedures applied were incisional and excisional biopsies of palpable lumps (in 3 and 20 cases respectively), while in the latter half of the study most of the cases had been diagnosed after image-guided or surgeon-performed core needle biopsy (37 cases, 45.7%); the next most common method of tissue withdrawal was excisional biopsy. Fine-needle aspiration had been done in 2 cases but had not lead to definite diagnosis. Vacuum biopsy is done in limited centers in Iran and was performed in only 5 (6.2%).

Surgery of DCIS should consider management of the breast and axilla. Traditionally, the strategy consisted of simple mastectomy (MAST) with near 100% response rate (Lambert et al., 2012; Siziopikou, 2013). As with invasive disease, the recent practice has gone through alterations because of adverse physical and psychological effects of breast amputation. The standard operation in DCIS, even in larger masses, has shifted toward breast conserving surgery (BCS), which can be completed by oncoplastic techniques, followed by radiation of the remaining breast tissue (Estevez et al., 2010; Leeper and Dixon, 2011; Lee et al., 2012; Livaudais et al., 2012). However, MAST is still needed in some cases of very extensive disease, inability to achieve negative margins, or impossibility of postoperative radiotherapy (Patani et al., 2011; Fortunato

et al., 2012; Lambert et al., 2012). Retrospective trials have shown that MAST, BCS with radiation, and BCS without radiation have all survivals in the range of 98-100%. Consequently, the main treatment goal for DCIS is not survival prolongation but recurrence reduction (Lee et al., 2012), because nearly 40-50% of recurrences of DCIS are invasive. The most effective factor in reducing recurrence in BCS is resection of enough clear margins, which although yet not definitely defined, has been described as 2 millimeters or more in most references (Patani et al., 2011; Lambert et al., 2012; Lee et al., 2012; Siziopikou, 2013).

Management of the axilla does not appear necessary in DCIS because lymphatic metastasis is not anticipated. There are nevertheless several indications to axillary sampling during surgery of DCIS. First of all, when the disease is diagnosed based on core needle biopsies, there is a probability (up to 30%) of missing invasive components. If the surgical approach consisted of MAST, then sentinel node dissection (SND) is warranted at the same time, because in case invasive disease would be seen in the specimen, then SND would be impossible after MAST. Second, some suggest that when the histology represents high-risk disease (comedonecrosis or high grade disease), or in the presence of a clinical mass, SND should be done at the time of BCS (Schneider et al., 2010; Patani et al., 2011; Usmani et al., 2011; Badruddoja, 2012; Lee et al., 2012; Park et al., 2013; Siziopikou, 2013). The necessity of SND in cases of DCIS harboring microinvasion is controversial. Pimiento et al. (2011) reviewed 87 cases of DCIS with microinvasion in their institution and found no risk factor for lymphatic invasion such as palpable mass, higher grades or comedonecrosis. Nevertheless, these researchers propose the use of SND in all cases of microinvasion accompanying DCIS (Pimiento et al., 2011). On the contrary, Parikh et al do not confirm the need to use any additional treatment modality further than standard surgery in these patients (Parikh et al., 2012).

According to Badruddoja, the late presentation of DICS in developing countries and the poor medical facilities in comparison with developed countries necessitates MAST to be the standard operation in these areas (Badruddoja, 2012).

In 1992, Chua et al. (1992) showed that in Singapore, between 1988 and 1990, the most commomly performed surgery for DCIS was mastectomy (Chua et al., 1992). Kokubo et al. (2001) reported 33 cases of DCIS who had been treated by BCS, axillary dissection, chemotherapy, radiotherapy and hormone therapy between 1987 and 1998 and had been followed from 32 to 80 months. They concluded that this treatment was effective for DCIS. (Kokubo et al., 2001) In their comparison of 2 series of DCIS which had been studied with an interval of 10 years, Tan et al demonstrated a higher proportion of conservative surgeries in the more recent study compared with the old one (Tan et al., 2002a). In 2006, Yau et al. (2006) carried out a retrospective study to assess the clinical outcome of BCS in cases of DCIS in Hong Kong by reviewing the 5-years follow ups of 75 cases; all had received wide local excision followed by radiation. They concluded that the effect of BCS and radiation for DCIS in Chinese women was comparable with those of Western countries (Yau et al., 2006). Chuwa et al. (2008) analyzed outcomes of treatment of 170 cases of DCIS in Singapore women attending their institution from 1994 to 2000 after 7 years of follow up. Most of the cases had received BCS with or without radiation, and more than one fourth had undergone axillary staging (Chuwa et al., 2008).

In phase 1 of our study, the most common performed breast operation was mastectomy (14 MAST *vs* 9 BCS). While SND was not performed in Iran before 2003, axillary management of our DCIS cases consisted of no intervention in only 4 cases and axillary dissection in 19, showing a significant tendency towards axillary treatment of *in situ* lesion; probably because of the advanced clinical presentations (mass, nipple discharge, skin changes) which induced the suggestion of invasive disease. However, the trend has been toward less invasive surgery in the next phase, where BCS has surpassed MAST (37 MAST vs 45 BCS). Nevertheless, there is still a high tendency toward axillary management in this latter period, which is still attributable to the high percentage of patients attending with poor clinical pictures. Approximately one fourth of patients had not gone through any axillary treatment, while 32 had undergone sentinel node dissection, half of which were in the BCS group; there were 25 cases of complete axillary dissection. It must be emphasized that most of the cases of no axillary intervention with BCS and SND with MAST were in the second half of phase 2.

In conclusion, our study shows a clear trend toward earlier detection of breast cancer between the two recent decades; although classified as a developing country, treatment strategies as well are progressing toward standard less invasive surgery of DCIS in Iran.

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