Management of Ductal Carcinoma in Situ of the Breast

- Experiences from National Naval Medical Center during last 10 years -

Seventy-one ductal carcinoma in situ (DCIS) patients were reported to the tumor registry at the National Naval Medical Center between 1986 and 1995. This number represents 6.5% of all breast cancer patients. We did not include the patients with microinvasion or infiltrating ductal carcinoma with extensive DCIS in this study. After excluding 16 cases because of inaccessible clinical records, 55 cases of pure DCIS were analyzed. The mean age at presentation was 52.0 years (32 year-old to 74 year-old) and the most common clinical feature was an abnormal mammographic finding (40 cases, 73%). Family history of breast cancer was positive in 14 cases among the 39 cases with DCIS (35.9%) according to the medical records. Total mastectomy was the most common form of treatment for DCIS (19 cases, 34.5%) during this period, followed by modified radical mastectomy, lumpectomy only, lumpectomy with radiation therapy. Three hundred and two axillary lymph nodes were examined but revealed no nodal metastasis. Comedo type DCIS was the most common subtype (21 cases, 38.2%). There were no local recurrences or DCIS related deaths reported to the tumor registry during this period (mean follow-up interval of 51 months). (*JKMS 1997; 12:545~9*)

Key Words : Carcinoma in situ; Carcinoma, Infiltrating duct; Breast neoplasms

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Received : March 7, 1997

Accepted : August 22, 1997

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INTRODUCTION

Carcinoma of the breast is believed to originate from multiple diffuse foci in normal breast tissue that coalesce over time to form a discrete tumor (1). In-situ carcinoma is considered as being the earliest and most hopeful phase of malignancy (2). Since the advent of screening mammography, the incidence of all breast cancer has increased, but detection of ductal carcinoma in situ (DCIS) has increased more markedly (3).

DCIS accounted for only 1% to 2% of all breast cancers before the widespread use of routine mammographic screening, but 8% of such cancers and 22% of those detected by screening are identified as DCIS recently (4). Screening mammography has also resulted in a change in its presentation from large, palpable mass to nonpalpable lesion manifested primarily as microcalcification (5). There is a 30 to 50% risk of subsequent invasive carcinoma following untreated DCIS, which generally develops within 10 years (5).

With the rising incidence of DCIS, accurate diagnosis and treatment is crucial. Some controversial points of view regarding the management of DCIS have evolved. Needle localization biopsy under local anesthesia is cur-

rently the standard method of biopsy for DCIS (7, 8). The addition of specimen radiography improves the accuracy of this procedure (9). Mastectomy has been the standard treatment of DCIS for several decades, and this method revealed an overall local recurrence rate of only 0.75% and an overall cancer-related mortality rate of only 1.7% (5, 6).

In recent years, breast conservation treatment has been used increasingly with DCIS in view of its excellent results in the treatment of invasive breast carcinoma. Lumpectomy alone may be used most appropriately to the cases of "incidental DCIS" with no clinical or mammographic manifestations of their presence (10, 11). Since lumpectomy alone has revealed high local recurrence rates, and because 50% of all local recurrences are invasive lesions which may adversely affect survival, Frykberg et al. (5) assert that most cases of DCIS currently are treated effectively by lumpectomy with radiation therapy. This therapy reduces the rate of invasive local recurrences remarkably (5, 12). However, the results of lumpectomy with radiation therapy for DCIS are still substantially inferior to those associated with mastectomy (13). Therefore, the appropriate role and safety of breast conservation for DCIS has yet to be resolved when

compared with mastectomy in a prospective, randomized study.

The purpose of this study is to analyze the various clinical aspects, especially the changing trend of operative methods of pure DCIS experienced at the National Naval Medical Center over a ten-year period, and to review the literature.

MATERIALS AND METHODS

A list of patients with ductal carcinoma in situ of the breast between 1986 and 1995 was compiled through a review of the statistics at the National Naval Medical Center tumor registry. We did not include the patients with microinvasion or those with infiltrating ductal carcinoma (IDC) with extensive DCIS. All the medical records of those patients with pure DCIS were collected and reviewed individually. A list of the total number of patients with breast cancer during the same period was also compiled.

There were 71 patients with DCIS in this period. Among them, 16 patients were excluded from this study because of inaccessible clinical records. All medical records of the remaining 55 patients with DCIS were reviewed.

We examined the age at presentation, clinical characteristics, family history, treatment modalities, histologic types, and follow-up results of all DCIS patients (mean follow-up interval of 51 months).

The chi-square test was performed to compare the incidences of the presenting characteristics of DCIS and the treatment modality for DCIS between the first half and the second half experimental periods. P values less than 0.05 were regarded as significant.

RESULTS

Over this ten year period, 1,092 patients with breast cancer and 71 cases of histologically confirmed DCIS patients were reported to the tumor registry. DCIS accounted for 6.5% of all breast cancers.

All 55 patients with DCIS were female, ranging in age from 32 to 74 years, with the mean age at presentation being 52.0 years. The fifth decade was the most frequently involved age with DCIS in this study (Table 1).

The most common presenting characteristics were mammographic abnormalities. Forty of 55 patients (72.7%) were diagnosed by abnormal mammographic findings such as microcalcifications, 13 (23.6%) patients were found with a mass, 1 (1.8%) with bloody nipple discharge, and 1 (1.8%) with an eczematoid nipple. The

Table 1. Age at presentation of DCIS of the breast

Age	Number of patients
30-39	3
40-49	18
50-59	14
60-69	14
over 70	6

Youngest ; 32 Oldest ; 74
Mean age at presentation ; 52.0

DCIS : ductal carcinoma in situ

Table 2. Comparison of presenting characteristics of DCIS of the breast between 1st and 2nd period

Presentation	Number of patients		
	1986-1990 (%)	1991-1995 (%)	Total (%)
Abnormal mammogram only	16(61.5)	24(82.7)	40(72.7)
Mass	9(34.6)	4(13.8)	13(23.6)
Nipple discharge		1(3.4)	1(1.8)
Eczematoid nipple	1(3.8)		1(1.8)
Total	26	29	55

DCIS : ductal carcinoma in situ

experimental period was divided into two sections, the first was for the years between 1986-1990 and the second included the years between 1991-1995. The percentage of patients with abnormal mammogram was 61.5% and a mass was 34.6% in the first period, but in the second period, the percentage was 82.7% and 13.8%, respectively. We noted an increase in abnormal mammographic findings, and a decrease of a mass as the presenting characteristics of DCIS in the second period, but a statistical analysis revealed no significance (P value =0.067) (Table 2).

Both breasts were involved at the same rate in this study, and we recognized 14 cases with a positive family history of breast cancer among the 39 patients with DCIS (35.9%), according to the medical records.

Among the various operative methods, total mastectomy was performed in 19 cases (34.5%), followed by modified radical mastectomy in 14 cases (25.5%) (Table 3).

In the first period, mastectomy was performed in 19 cases (73.1%), lumpectomy in 7 cases (26.9%) and in the second period, breast conservation treatments were used in 15 cases (51.7%), mastectomy in 14 cases (48.3%), but the differences between these two periods were statistically insignificant (P value=0.061) (Table 3).

302 axillary lymph nodes were pathologically examined in this study but all nodes were proved to be

Table 3. Comparison of operative methods for DCIS of the breast between 1st and 2nd period

Treatment	Number of patients		
	1986-1990(%)	1991-1995(%)	Total(%)
Modified radical mastectomy	13	1	14(25.5)
Total mastectomy	6	13	19(34.5)
	19(73.1)	14(48.3)	33(60.0)
Lumpectomy + RT	3	7	10(18.2)
Lumpectomy only	4	8	12(21.8)
	7(26.9)	15(51.7)	22(40.0)
Total	26	29	55

DCIS : ductal carcinoma in situ

RT : radiation therapy

negative for malignancy.

The comedo type was noticed in 21 cases (38.2%) and the cribriform type was in 14 cases (25.5%) in this study.

In the follow-up of 55 patients with DCIS, there were no locoregional recurrences reported to the tumor registry, but several interesting cases of cancer recurrences were noticed. The first case underwent a total mastectomy because micropapillary DCIS of the right breast. Six months later, the mammogram revealed microcalcification of the left breast, which was confirmed pathologically as a 1.5 cm sized infiltrating ductal carcinoma with DCIS. The second case was a patient who had lobular carcinoma in situ (LCIS) of the left breast for 10 years, and a DCIS of the right breast was detected during the follow-up. The third case was a patient with LCIS of the right breast. One year later, she was found to have a DCIS in the same site which was confirmed with re-biopsy of the residual calcification. None of these cases could be considered as a local recurrence after treatment of DCIS.

There were also three cases of unrelated cancers, such as melanoma, pancreatic adenocarcinoma, basal cell carcinoma of the nose, all of which developed between 6 months and 6 years after treatment for DCIS of the breast.

No DCIS related mortality cases was reported to the tumor registry during this follow-up period.

DISCUSSION

The overall incidence of breast cancer has increased with the widespread use of routine mammographic screening. Between 1973 and 1987, there has been a

fivefold increase in the incidence of in situ breast carcinoma in the United States (6). Twenty years ago, DCIS accounted for only 1% to 2% of all breast cancers, but today 8% of such cancers, and 22% of those detected by screening, are identified as DCIS (4). In this study, we revealed a 6.5% incidence of DCIS in all breast cancer patients.

Before the widespread use of routine mammographic screening, over 50% patients with DCIS presented with a palpable mass (6). Mammographic screening has led to an increasing percentage of small, nonpalpable or microscopic forms of DCIS (2, 5, 15), which in recent years, have been the predominant type of DCIS and have the best prognosis (16).

In reality, 95% of all instances of carcinoma in situ detected by mammography are associated with microcalcifications, and 80% of all carcinomas presenting as mammographic microcalcifications are usually DCIS (15, 17). A mammographic mass or an interval change over time in a mammographic finding can also be associated with in situ lesions, but asymmetric densities or architectural distortions have little impact on the diagnosis of DCIS (12).

DCIS occurs predominantly in women, but accounts for 5% of all male carcinomas of the breast (18). In this study, there were no male patients.

The average age of patients with this diagnosis is approximately 54 to 56 years. This is not significantly different from the age of women with invasive breast carcinoma (19, 20); in this study, the mean age at presentation was 52.0 years.

Abnormal mammograms are usually identified prior to the discovery of a palpable mass (21). Through the analysis of presenting characteristics of DCIS in this study, we observed the tendency toward the increase of abnormal mammographic findings and decrease of a mass as the presenting characteristics of DCIS in the second period, which may confirm more recent increase of early detection of DCIS by screening mammography.

There are several distinct histologic patterns of DCIS, which probably represent successive steps in its evolution toward invasive carcinoma (22). They are usually classified as micropapillary, papillary, cribriform, solid, and comedo types. The comedo type is the most common: 25% to 50% of all DCIS (23, 24). In this study, the comedo type was noticed most commonly and the cribriform type was the second most common type.

Needle localization biopsy under local anesthesia is currently the most frequently used diagnostic modality for the biopsy of nonpalpable mammographic microcalcifications and mammographic masses or interval changes over time in mammographic findings. This method is safe, and cost effective, and is a highly accurate

modality (2, 5, 7, 8). The addition of specimen radiography improves accuracy by confirming the complete removal of the suspicious lesion (2). Fine needle aspiration biopsy (FNAB) may be effective in the diagnosis of DCIS, but it cannot analyze the overall histologic architecture to exclude stromal invasion accurately, and frozen sectioning is also considered unnecessary and unreliable in the diagnosis of DCIS (2, 5). In this study, all the patients with abnormal mammogram were diagnosed with needle localization biopsy under local anesthesia.

Treatment modalities for DCIS include total mastectomy, lumpectomy with radiation therapy, or lumpectomy alone (25). Among them, mastectomy is considered to be the "gold standard" of treatment modalities for DCIS (2), because DCIS is associated with a higher incidence of multicentricity than are invasive lesions (26).

Many authors believe that ipsilateral mastectomy is sufficient and adequate for the treatment of DCIS. This method revealed an overall local recurrence rate of only 0.75% and an overall mortality rate of only 1.7% during follow-up intervals ranging from 2.3 years to more than 15.0 years (6, 14).

It is, however, difficult to justify a mastectomy for DCIS when lesser procedures are now widely accepted for the treatment of more advanced invasive carcinomas. Moreover, some authors suggest that not all DCIS progresses to invasive carcinoma after 15 to 20 years of follow-up, and so the possibilities of "overdiagnosis" and unnecessary treatment for DCIS are possible. Therefore, they assert that breast conservation treatment should be used in these cases (4, 27).

Many recent studies demonstrated good results of lumpectomy with radiation therapy (12, 29), with a local recurrence rate of 9% and cancer related mortality of approximately 1% during the follow-up, which ranged up to 92 months (5, 12). However, other authors believe that the results of this modality remain substantially inferior to those associated with mastectomy (14, 30).

Lumpectomy alone may be used most appropriately in cases of "incidental DCIS", less than 0.5 cm in size, and showing no evidence of further disease after re-excision of the biopsy site (2, 10, 11). Lumpectomy alone has revealed local recurrence rates ranging from 10% to 75% over follow-up intervals of up to 14 years (14, 16, 24). Most of these local recurrences were found in the immediate vicinity of the original biopsy site, suggesting inadequate excision as the cause of recurrence (2, 5). A substantial portion of local recurrences occurred after more than 5 years, and recurrence rates consistently increased with longer follow-up intervals (2, 14); therefore younger women with DCIS should undergo mastectomy because of their longer life span and the more aggressive behavior of cancer (28). It is prudent to offer mastectomy to those

with substantial risks for locoregional recurrence, such as extensive residual foci of DCIS or difficulty in obtaining pathologically clear margins (5).

Axillary lymph node dissection is generally not necessary, but may be indicated in instances with palpable axillary adenopathy, the possibility of invasion, or in cases of invasive local recurrences (31, 32). All comedo type patterns and large, palpable masses with DCIS may also be an indication for axillary dissection (11).

Theoretically, in pure in situ carcinoma, there can be no metastasis to the axillary nodes, and not a single patient died of cancer (33). However, Silverstein et al. (31) have revealed 1% to 2% findings of axillary node metastasis in cases of DCIS. In this study, we did not find any metastasis to the axillary nodes, local recurrence, or cancer related mortality during the mean follow-up interval of 51 months.

Several factors may have contributed to the good results of this study. First of all, we included only pure cases of DCIS. Additionally, during the first half of experimental period, 13 cases (50%) were treated with modified radical mastectomy which may be considered "overtreatment" for DCIS.

Even though the result of statistical analysis was insignificant, we could observe the tendency toward the minor operations as the method of treatment for DCIS in the second period in this study.

We conclude that early detection and adequate surgical resection by total mastectomy may be curative for ductal carcinoma in situ, and because the follow-up is relatively short in this study, we have to confirm the safety of breast conservation with a longer follow up in a prospective randomized study.

Acknowledgement

We appreciate Miss Gabriela Tymowski, M.A. University of Western Ontario for careful review of this manuscript.

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