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Original Paper

Ductal Carcinoma *In Situ* of the Male Breast. Analysis of 31 Cases

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From 1970 to 1992, 31 pure ductal carcinoma *in situ* (DCIS) of the male breast treated in 19 French Regional Cancer Centres were reviewed. They represent 5% of all breast cancers treated in men in the same period. The median age was 58 years, but 6 patients were younger than 40 years. TNM classification (UICC, 1978) showed 12 T0 (discovered only by bloody nipple discharge), 10 T1, 5 T2 and four unclassified tumours (Tx). 11 patients (35.5%) had clinical gynecomastia, and three (10%) had a family history of breast cancer. 6 patients underwent lumpectomy, and 25 mastectomy. Axillary dissection was performed in 19 cases. 6 cases received postoperative irradiation. 15 out of 31 lesions were of the papillary subtype, pure or associated with a cribriform component. The size of the 12 measured lesions varied from 3 to 45 mm. All lymph nodes sampled were negative. With a median follow-up of 83 months, 4 patients (13%) presented a local relapse (LR), respectively, at 12, 27, 36 and 55 months. 3 of these patients had been initially treated by lumpectomy. In one case LR was still *in situ*, but already infiltrating in the 3 others. Radical salvage surgery was performed in 3 cases, but one patient developed metastases and died 30 months later. The last patient was treated by multiple local excisions and tamoxifen. One 43-year-old patient developed a contralateral DCIS and three others developed a metachronous cancer. The aetiology and risk factors of male breast cancer remain unknown. Gynecomastia, which implies an imbalance between androgen and oestrogen, may be a predisposing factor. As in women, DCIS in the male breast has a good prognosis. Total mastectomy without axillary dissection is the basic treatment. Frequently, the first symptom is a bloody nipple discharge. The age of occurrence is younger than for infiltrating carcinoma, suggesting that DCIS is the first step in the development of breast cancer. © **1997 Elsevier Science Ltd. All rights reserved.**

Key words: male breast cancer, ductal carcinoma *in situ*, treatment, local recurrences

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INTRODUCTION

WHILE DUCTAL carcinoma *in situ* (DCIS) is well-documented in women, in men this disease is less well defined. This situation certainly reflects the incidence of this disease; mammographic screening has revealed that DCIS accounts

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Table 1. Frequency of DCIS in the literature

Author	*n* (total)	*n* (DCIS)	%
Visfeldt (1973) [17]	187	0	
Ramantanis (1980) [18]	138	0	
Erlichman (1984) [1]	89	1	1
Salvadori (1994) [2]	170	4	2.3
Scheicke (1973) [3]	176	5	3
Stierer (1995) [4]	169	8	4.7
Treves (1955) [5]	110	7	6
Holleb (1968) [6]	198	12	6
Vanderbilt (1971) [7]	52	3	6
Norris (1969) [8]	113	8	7
Gadenne (1982) [9]	73	5	7
Langlands (1976) [10]	88	6	7
Vercoutere (1984) [11]	45	3	7
Heller (1978) [12]	97	8	8
Borgen (1992) [13]	104	16	15
Ouriel (1984) [14]	50	8	16
Camus (1994) [15]	23	4	17
Present series*	621	31	5

*Including 15 out of 404 cases (3.7%) previously reported which have been omitted.

for up to 20–25% of female breast cancers (compared with the 3–5% shown in earlier studies), whereas the frequency in men varies widely, ranging from 0–17% with an average of 7% (Table 1) [1–15]. However, male breast cancer (MBC) represents less than 1% of all breast cancers in Western countries.

A retrospective multicentric study was carried out from 1970 to 1992 in 19 French Regional Anticancer Centres and 31 male cases of pure DCIS were found. To our knowledge, this is the largest series ever described in men. We have analysed in detail the clinico-histological characteristics of these lesions, the optimal treatment and the long-term outcome.

PATIENTS AND METHODS

From January 1970 to December 1992, 621 patients with non-metastatic MBC were screened in 19 centres. Pure DCIS was observed in 31 cases (5%). The median age was 58 years (range 26–74), and 6 (19.3%) were younger than 40 years. 12 patients had only bloody nipple discharge as the first symptom, and were classified T0. Other patients had a clinical palpable mass (4 with nipple discharge) and 10 were classified as T1, 5 as T2 and 4 as Tx. Clinical gynecomastia was present in 11 cases (35.5%). 3 patients had a family history of breast cancer.

Previous medical history included diabetes in 3 cases, hypertension in 5, asthma and respiratory deficiency in 2. Several patients had received long-term treatment with drugs that may induce modifications in the androgen–oestrogen balance.

The left breast was involved in 22 cases (71%) and the right in 9 cases. The median interval between the first symptom and diagnosis was 3 months (range 1–72). 6 patients underwent lumpectomy. 2, 18 and 5 had, respectively, radical, modified and simple mastectomy. 19 patients had axillary dissection (61.3%) with an average of 13 resected lymph nodes (range 4–27). 6 patients received chest wall irradiation and three also had regional node irradiation.

Table 2. Histological DCIS subtype

Papillary	7 (23%)	39%
Papillary + cribriform	5 (16%)	
Cribriform	3 (10%)	
Apocrine	1 (3%)	
Comedocarcinoma	3 (10%)	
DCIS NOS	12 (39%)	
Associated histological gynecomastia	7 (23%)	

NOS, not otherwise specified.

RESULTS

The histological subtypes of DCIS are shown in Table 2. There was predominance of the papillary subtype, pure or with a cribriform associated component. Comedocarcinoma was observed in only three cases, but in 39% of the cases, the subtype was not specified. The size of the lesions was specified in 12 cases, ranging from 3 to 45 mm. In many cases, only one or very few foci of DCIS were noted. All lymph nodes sampled were negative.

With a median follow-up of 83 months (for the 27 patients alive), 4 patients presented a local relapse (LR), in one case *in situ*, but infiltrating in three cases, occurring after 12, 27, 36 and 55 months, respectively. The recurrence-free survival rate was 83% at 5 and 10 years (Figure 1). The initial treatment given to these 4 patients was lumpectomy in three cases and modified radical mastectomy in one. Radical salvage surgery was then performed in the first three cases: an extensive axillary involvement (11 out of 16 positive lymph nodes) was observed in a 55-year-old man previously treated by lumpectomy alone. This patient received six cycles of chemotherapy, locoregional irradiation and tamoxifen; 4 years later, lung and bone metastases occurred and he died 30 months later. The last patient, previously treated by modified radical and chest wall irradiation, had a simple local excision, but two other recurrences occurred subsequently. He is now presenting slow locoregional disease and is being treated with tamoxifen.

A 43-year-old patient presented a nipple discharge in the right breast 6 months after a modified radical mastectomy of the left breast for papillary intracystic DCIS. The same

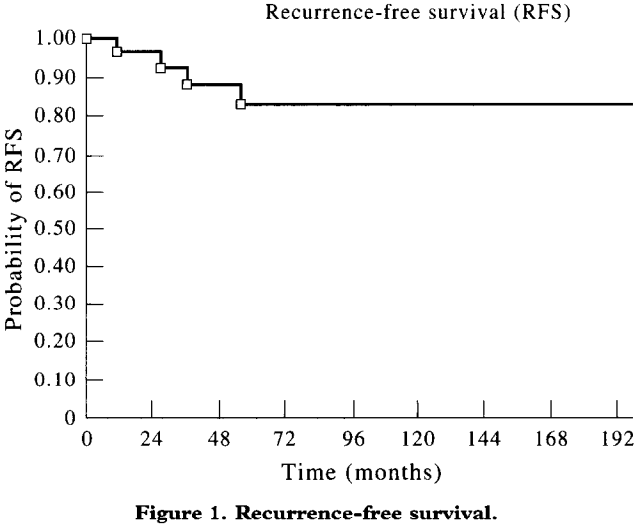

Figure 1. Recurrence-free survival.

radical surgery was performed revealing a cribriform contralateral DCIS. He is alive 8 years later.

3 patients had another metachronous cancer: clear cell renal adenocarcinoma, squamous carcinoma of the lung, and non-Hodgkin's lymphoma, 4, 6 and 8 years, respectively, after treatment of the breast DCIS. The first died of post-operative complications, and the other 2 are now in remission. All other patients are alive, except 2 who died of unknown causes, 4 and 8 years after DCIS treatment.

DISCUSSION

In men, DCIS of the breast is a very rare lesion, and to date, less than 100 cases have been published [3–15] (Table 1). In this study, we have described 16 additional cases to the 15 cases observed among 404 men with breast cancer in our first report [16].

In some series, the proportion of the different histological subtypes is not specified or, as non-invasive tumours are excluded, the real frequency of DCIS varies widely, from 0% [17, 18] to 17% [15], with an average of 6–8% [5–12]. Moreover, clinical features, age distribution, histological subtypes, treatment and outcome are detailed only in very few publications [15, 16, 19].

The first symptoms and the age of DCIS occurrence in men are specified only in two previous reports [15, 19]. In our series, DCIS was diagnosed only by bloody nipple discharge in 12 cases (39%), and the rest had a palpable mass, 4 with nipple discharge.

In contrast to Camus and associates [15], we found clinical gynecomastia (confirmed pathologically in 7 cases) in 11 patients (35.5%); the origin may be due partly to long-term treatment of chronic diseases using drugs that modify the normal balance between oestrogen and testosterone (e.g. spironolactone, digitalis).

As to histology, we confirmed previous data in the literature [6, 7, 10, 12, 14, 15] of a predominance of papillary forms: pure, intracystic or with an associated cribriform component (see Table 2). In contrast, comedocarcinoma seems rare: 3 out of 18 cases in our series and one each reported by Cole and Erlichmann [1, 19], whereas in women it accounts for approximately 20–30% of DCIS [20].

In the literature, only two authors detailed the types of surgery performed in men with DCIS: in Heller's series [12], 2 patients were treated by simple mastectomy, (4 by modified radical mastectomy, and 2 by radical mastectomy; Camus and associates [15] reported that 2 cases had received a partial mastectomy, 1 a modified radical mastectomy and 1 a radical mastectomy. With a median follow-up of 83 months, 4 of our patients (13%) had LR (3 invasive), but 3 of these patients had only received lumpectomy as first treatment. Thus, in our series, only one LR occurred after radical surgery. Camus also noted two LR out of four cases, both treated initially by partial mastectomy alone. No other LR are reported in the literature. One of our patients developed metastases (3.2%) after invasive LR and died. Ouriel and associates reported one death by cancer without any other details [14].

One case of contralateral metachronous DCIS was observed in our series. To our knowledge, this is a unique case in the literature. In patients with male breast infiltrating carcinoma, the contralateral rate ranges from 1.4 to 2% [21–24]. In women, the overall rate of contralateral breast cancer is similar to that of infiltrating and *in situ* carcinomas: 1–2% synchronous and 7–10% metachronous. 3 patients developed a second metachronous cancer in different sites and of different histological types. In a previous report [25], we had already noted the high incidence (10.6%) of second neoplasms in men with MBC, especially in the prostate, lung and digestive tract. This fact has also been reported by others [1, 9, 10, 21, 26, 28]. There is no clear explanation, but this may be partly related to the patients' median old age.

In women, histological classifications and treatment of the DCIS are still subject to discussion [29, 30]. Originally, six DCIS subtypes were described: cribriform, solid, papillary, micropapillary, clinging and comedocarcinoma, considered as the most aggressive; these lesions may be mixed in various proportions in approximately 30–50% of cases. More recently, new classifications have been proposed, based on nuclear grade, differentiation and the absence or presence of necrosis. Historically, mastectomy yields a control rate of approximately 98%, but this approach is considered as overtreatment in the majority of the cases. The conservative approach consists of a quadrantectomy or lumpectomy alone or with radiotherapy [31–35]. Conservative treatment in women has increased noticeably in the last few years [38, 40] due to the wide development of mammographic screening, which allows the early discovery of approximately 80% of DCIS, especially corresponding to limited foci of microcalcifications.

After lumpectomy alone, LR rates vary from 15 to 63% [30–33], depending on the selection criteria (e.g. infraclinical DCIS, complete excision, size less than 2 cm, subtype etc.) and the length of the follow-up. After lumpectomy plus radiotherapy, LR rates vary from 3% to 15% [34, 37–39, 41], depending also on the same criteria, plus the radiotherapy dose (whole breast and boost). This combined therapy results in a clear reduction in LR rate, particularly seen in the unique multicentric randomised trial (NSABP B-17) [37]. In approximately half the cases, LR are still DCIS, but the other cases are invasive lesions [36, 39, 41], with a potential risk of lymph node invasion and subsequent metastases.

In men, the cosmetic aspect is of minor importance and, therefore, the optimal treatment for DCIS is simple mastectomy [15, 16]. Axillary dissection is unnecessary, except if the lesion is comedocarcinoma or larger than 2.5 cm [15, 16, 32] when the risk of occult microinvasion would be increased.

Concerning the aetiology of MBC, and especially DCIS, the risk factors have not yet been identified [22]. As observed in women, DCIS occurs in men earlier than invasive carcinoma, 6 years earlier in our series [23], 10 years in the series reported by Camus and associates [15]. This fact suggests that DCIS may be a first step in the neoplastic process. Therefore, a definitive treatment at this stage offers an excellent prognosis, as noted previously in women, even though the survival rate for invasive carcinomas in men is markedly lower, especially in the case of axillary involvement [23, 24]. Early diagnosis is important, and a breast mass in men and especially bloody nipple discharge requires a thorough assessment.

In conclusion, DCIS in men is a rare disease, representing 5% of MBC. It is often revealed by bloody nipple discharge, sometimes in very young men. The most common histological subtype is papillary, and total mastectomy without axillary dissection is the standard approach to all DCIS. No adjuvant treatment is required and the prognosis is excellent.

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