Acta Radiologica Oncology 22 (1983) Fasc. 2

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CONSERVATIVE MANAGEMENT OF BREAST CARCINOMA

The Créteil experience

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More than 900 patients with carcinoma have been treated conservatively during the past 21 years. The aim was to give the patient with breast malignancy a treatment preserving the breast and thus avoiding the psychologic trauma that follows a mastectomy, at the same time assuring the patient a loco-regional control equivalent to that obtained by radical treatment methods which result in loss of the breast. The survival, local recurrence, cosmetic appearance, and iatrogenically induced complications are now reported. Tumorectomy before or after radiation therapy will also be discussed.

Methods

The following criteria were used to select the patients for conservative treatment: (1) not previously treated for breast malignancy, (2) without distant metastasis at the time of presentation, (3) absence of other primary lesions in the contralateral breast or other locations, (4) all patients with T1, T2 or T3 lesions less than 7 cm who refused surgery, and (5) all N0, N1a and N1b less than 2 cm.

The majority of the patients with T1 lesions (80%) were initially treated with tumorectomy without axillary lymph node dissection (except certain N1b). This was followed by preliminary external irradiation with telecobalt to the breast and underlying chest wall by tangential beams and the axillary, supra- and subclavicular and internal mammary lymph nodes by a direct field up to a dose of 45 Gy. Electron boost (10–13 MeV) was given to the internal mammary lymph node chain (15 Gy) and to axillary lymph nodes (24 Gy). At the completion of the electron boosts iridium was implanted in the breast corresponding to the area containing the residual tumor (boost dose 37 Gy) or the tumorectomized area (boost dose 25 Gy). For T2 lesions, the same method was applied, but the proportion of tumorectomies performed before irradiation was inversed (20% of cases). For T3 lesions the treatment was mostly non-conservative consisting of preliminary external irradiation with telecobalt to a dose of 45 Gy followed by radical surgery (Patey type mastectomy with axillary dissection). For those patients who refused surgery, radical irradiation was carried out in a similar manner to that used for the T1 and T2 lesions (boost dose 37 Gy).

Results

The survival is presented in Table 1 after a minimum follow-up of 5, 7 and 10 years for T1, T2 and T3 lesions. The incidence of N1b is low for T1 (4%) and T2 (12%) lesions, but much higher (35%) for T3 lesions. Even though the survival rates are different at 5 years between the T1 (84% NED), T2 (75% NED) and T3 lesions (65% NED, Table 2), it is interesting to note the equalization of the rates at 10 years between the uncorrected and NED survivals on the one hand and between the survival of T1 and T2 lesions on the other. It appears as if no further

Accepted for publication 23 November 1982.

manifestation of the disease occurs after about 10 years for T1, T2 or T3 lesions, and the long term prognosis for T1 and T2 lesions seems to be identical once the maximum risk for development of metastases has passed during the first few years. At the same time it is worth noting the identical rate (27%) of distant metastasis at 10 years for T1 and T2 lesions (Table 3).

After 5 years, the rate of local recurrence in the breast or peripheral lymph nodes rapidly reaches a plateau of less than 10 per cent for T1 and T2 and less than 20 per cent for T3 lesions (Table 4). The recurrence rate at 10 years is almost identical for T1 and T2 lesions (T1 8%, T2 9%). It is to be noted that the proportion of breasts conserved amongst the NED patients at 5, 7 and 10 years remains high and unchanged. Of the 39 local recurrences detected clinically during the last 10 years of observation, the majority (32/39) were found in the breast itself, half of these were located at a distance from the initial site of involvement (19/39). No isolated lymph node recurrences were observed for T1 and T2 and were infrequent for the T3 lesions (2/74). Local recurrences in the breast occurring at the same time as lymph node metastases detected clinically remain rare for T1 and T2 (3/334) as well as for T3 lesions (2/74; Table 5). Surgical cure by mastectomy and axillary dissection (according to Patey or Halsted) was possible in most of the cases (33/39). Four cases necessitated skin grafts (2 T2 and 2 T3; Table 6). Overall the proportion of local recurrences with lymph node metastases remains low; only 5 (1.5%) lymph node recurrences confirmed microscopically were observed during 10 years (Table 7).

The cosmetic results stabilize around 3 years after treatment. The physical appearance of the breast is classified according to three categories: (1) Very good, for those without sequelae or with only a discrete change not apparent at first glance, (2) quite good, for those developing obvious sequelae such as telangiectasia or alteration of breast contour but which are acceptable in preference to mastectomy, and (3) poor, when the cosmetic results are such that initial surgery would have been preferable. The observations at 5, 7 and 10 years are summarized in Table 8: 87 per cent very good for T1 lesions, 54 per cent for T2 and 40 per cent for T3 lesions. The poor results are one per cent for T1, 7 per cent for T2, and 15 per cent for T3 lesions. In assessing the cosmetic results for patients operated upon with tumorectomy it is to be emphasized that only the tumour bed was excised and the boost dose was relatively moderate (25 Gy instead of 37 Gy). Very good cosmetic results were obtained in 90 per cent of the T1 patients in whom tumorectomy was performed versus 72 per cent in those without tumorectomy. For the T2 lesions, the results were less spectacular (65% versus 51%). A comparison between the patients operated upon at this hospital and at another hospital before referral reveals that the very good results are as high as 83 per cent at this hospital compared with a much lower rate (47%) for those operated upon in another hospital (Table 9).

Table 1

Distribution of patients by classification and follow-up (5, 7 and 10 years). The percentage is of N1b is shown for each T category

	5 years			7 years	10 years
	No. of cases	Per cent	Per cent N1b		
T1	99	24	4	66	26
T2	235	58	12	145	67
T3	74	18	35	57	33
Total	408			268	126

Iatrogenic complications other than those affecting the cosmetic appearance of the breast are relatively unimportant. Therefore only those of a definite and lasting nature will be considered. Minor pains were observed in the breast or scapular region in less than 5 per cent of the cases. Amongst the NED patients up to the present time, no case of severe neuritis involving the brachial plexus has been observed. The same applies to paresis or paralysis of the nerve roots. Minor limitations of shoulder movements were observed in 5 to 10 per cent of the cases, probably due to radiation induced sclerosis of the pectoralis major muscle. No case of severe impairment of shoulder movement has been observed. Lymphedema of the upper extremity was rare (less than 5% of cases) and of a limited degree when present. Only one case of radiation induced breast necrosis was observed which necessitated mastectomy (T2, boost dose 37 Gy).

Discussion

Patients with carcinoma of the breast have been treated since 1961 with the aim of conservative management if possible.

Table 2

Uncorrected and NED survivals at 5, 7 and 10 years for T1, T2 and T3 lesions. Per cent in parentheses

	T1			T2			T3		
	No. of cases	Alive	Alive NED	No. of cases	Alive	Alive NED	No. of cases	Alive	Alive NED
5 years	99/408	89/99 (90)	83/99 (84)	235/408	192/235 (82)	177/235 (75)	74/408	51/74 (69)	48/74 (65)
7 years	66/268	54/66 (82)	50/66 (76)	145/268	114/145 (79)	103/145 (71)	57/268	37/57 (65)	29/57 (51)
10 years	26/126	17/26 (65)	17/26 (65)	67/126	46/67 (68)	43/67 (64)	33/126	15/33 (45)	15/33 (45)

Table 3

Distribution of distant metastases at 5, 7 and 10 years. Per cent in parentheses

	T1	T2	T3
5 years	14/99 (14)	49/235 (21)	23/74 (31)
7 years	13/66 (20)	35/145 (24)	23/57 (40)
10 years	7/26 (27)	18/67 (27)	15/33 (45)

Table 4

Local recurrence rate for T1, T2 and T3 lesions. Proportions of breasts conserved among NED patients. Per cent in parentheses

	T1		T2		T3	
	No. of cases	Breast/ NED	No. of cases	Breast/ NED	No.of cases	Breast/ NED
5 years	3/99 (3)	82/83 (99)	15/235 (6)	169/177 (95)	12/74 (16)	41/48 (85)
7 years	3/66 (5)	48/50 (96)	13/145 (9)	98/103 (95)	10/57 (17)	25/29 (86)
10 years	2/26 (8)	16/17 (94)	6/67 (9)	40/43 (93)	5/33 (15)	12/15 (80)

The results at 10 years compared with the results at 5 (PIERQUIN et coll. 1980) and 7 years have demonstrated a 'plateau' in survival. This probably indicates that the potential for the development of late local recurrence or distant metastasis is extremely low, and if they appear have a very slow progression (CLARK et coll. 1982).

These results are comparable to those obtained by surgery or combined radiation therapy and surgery (HANNOUN 1978). However, it must be kept in mind that these comparisons are made in non-randomized series.

The only randomized trial was published by VERONESI et coll. (1981), in which the conservative (quadrantectomy and radiation therapy) and non-conservative techniques (Halsted type operation) were shown to produce identical survivals at 5 years (Table 10). This trend was confirmed at 7 years follow-up (VERONESI 1982).

The low rate of local recurrence in the present series (less than 10% at 10 years for T1 and T2 lesions) is in accordance with the experiences at the Curie Institute (CALLE et coll. 1978, CALLE 1982) for T1 and T2 lesions subjected to tumorectomy but differs for T2 and T3 lesions not operated upon; the incidence of local recurrence is higher at Institut Curie (Table 11). Overall the proportion of breasts conserved at 10 years is identical at the two centers for T1 and T2 lesions subjected to tumorectomy and is of the order of 95 per cent for the NED patients. On the other hand this proportion remains high for patients with T2 and T3 lesions not undergoing tumorectomy treated at this hospital (95% for T2, 80% for T3) while it is around 50 per cent for patients treated at Institut Curie. This may be due to the technique of dose delivery. After tumorectomy it is sufficient to give a boost of 20 to 25 Gy to the original tumor area, which is easily done using external irradiation (telecobalt or electrons) or by interstitial therapy (^{192}Ir). When a tumorectomy has not been performed, it is necessary to deliver a higher boost of the order of 35 to 40 Gy to the residual tumor to obtain an overall rate of control

Table 5

Distribution of clinically detected local recurrences

	No. of cases	T	N	T&N	Total
T1	99	3	0	1	4
T2	235	19	0	2	21
T3	74	10	2	2	14
Total	408	32	2	5	39

Table 6

Surgical control of loco-regional recurrences

	Radical surgery	Uncontrolled	Total
T1	4	0	4
T2	20*	1	21
T3	9*	5	14
Total	33	6	39

*Two T2 and two T3 with graft.

Table 7

Histopathologic information regarding T and N for 33 patients operated upon with radical surgery for local recurrences

	T+N−	T+N−	T−N+	Total
T1	3	1	0	4
T2	16	4	0	20
T3	3	4	2	9
Total	22	9	2	33

Table 8

Assessment of cosmetic results for patients with local control at 5, 7 and 10 years. Per cent in parentheses

	Years	Very good	Quite good	Poor	Total
T1	5	32	4	0	36
	7	34	3	0	37
	10	12	4	1	17
Total		78 (87)	11 (12)	1	90
T2	5	33	23	5	61
	7	39	28	4	71
	10	21	16	4	41
Total		99 (54)	67 (39)	13 (7)	173
T3	5	3	4	3	10
	7	9	9	1	19
	10	4	5	2	11
Total		16 (40)	18 (45)	6 (15)	40

Table 9

Cosmetic results in relation to tumorectomy. Very good results at 5 years and more. Per cent in parentheses

	Tumorectomy	No tumorectomy	Total
T1	65/72 (90)	13/18 (72)	78/90 (87)
T2	24/37 (65)	69/136 (15)	93/173 (54)
	Inner 15/18 (83) Outer 9/19 (47)		
T3			16/40 (40)

which is equivalent to that obtained when a tumorectomy has been performed. The total dose delivered locally exceeds 90 Gy (50 Gy for a reference isodose 45 Gy—preliminary irradiation—, plus >40 Gy for a reference isodose of 37 Gy—boost irradiation) which is achieved using interstitial therapy. Due to the limiting factor of the skin tolerance, the boost delivered by external irradiation should not exceed 25 Gy (total dose should not exceed 80 Gy). This fact should be modified as, at the Institut Curie, a large number of the patients irradiated without tumorectomy are not given a full tumor dose if the tumor regression is insufficient after 50 to 55 Gy. These patients are then operated upon with a modified radical mastectomy with axillary dissection. These failures of radical irradiation cannot be considered in the same light as failures of an irradiation carried to full tumor doses.

The survival, local recurrence, or distant metastases at 10 years are nearly identical for T1 and T2 lesions. Therefore, conservative management appears possible for all tumors of 1 to 5 cm (HARRIS & HELLMAN 1982). The same does not apply to the T3 lesions as the survival of these patients at 10 years, even though stable, is clearly very low with a high rate of local recurrence. It is worth noting that conservative management was used in selected T3 lesions only if three conditions were fulfilled: (1) the

Table 10

Halsted type operation or quadrantectomy and radiation therapy at Istituto Nazionale Tumore, Milan 1981. Survivals at 5 years. Figures give percentages

	Halsted (n=349)	Quadrantectomy + radiation therapy (n=352)
N–	75	73
Local recurrences	0.8	0.2
Distant metastases	8	6
Overall survivals	90	90
NED survivals	83	84

Table 11

Percentage of breasts preserved (T1–T2, alive NED) at Institut Curie and Hôpital Henri Mondor (Créteil)

	Tumorectomy +radiation therapy	Radiation therapy alone
5 years		
Curie	95	47
Créteil	97	96
10 years		
Curie	88	53
Créteil	95	95

Table 12

Incidence of second primary in contralateral breast at 5, 7 and 10 years. Per cent in parentheses

	5 years	7 years	10 years
T1	6/99 (6)	6/66 (9)	2/26 (8)
T2	4/235 (2)	6/145 (4)	3/67 (4)
T3	5/74 (7)	6/57 (10)	3/33 (9)
Total	15/408 (3.6)	18/268 (6.7)	8/126 (6.3)

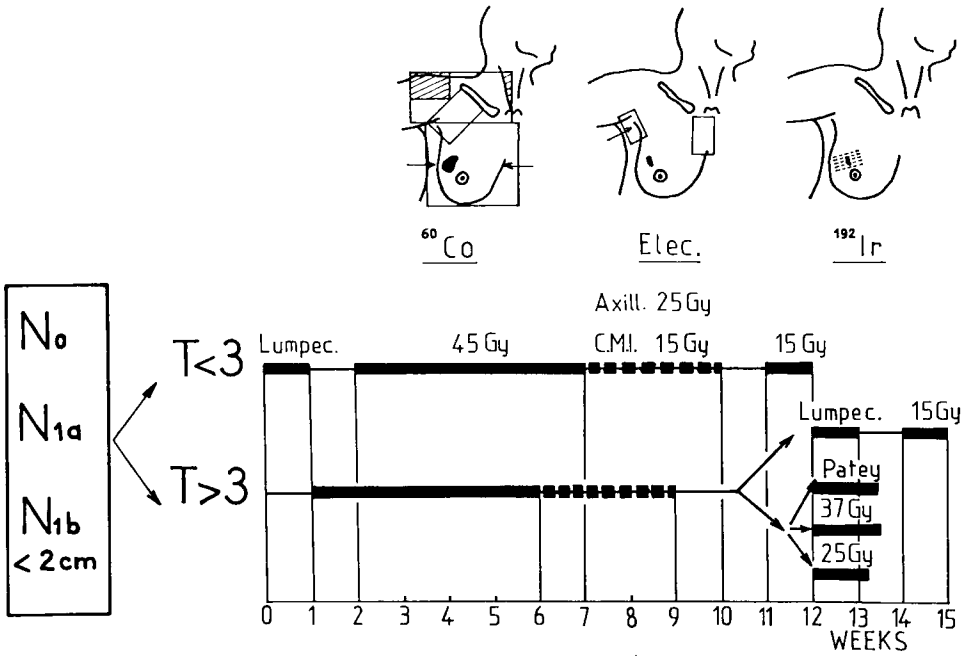
primary tumor less than 7 cm, (2) appreciable tumor reduction (50%) after preliminary external irradiation, and (3) if the patient expressed a strong desire to preserve her breast, understanding and accepting the increased risk of local failure or poor cosmetic result. On the whole, the results for T3 lesions treated conservatively after proper selection are relatively satisfactory and worthy of consideration.

The cosmetic results are clearly related to the total dose delivered to the tumor bed in the breast. The best results were obtained (90% very good) when a tumorectomy could be performed, thus permitting a reduction of the boost dose. The poor cosmetic results (retraction, telengiectasia) were as a rule limited to the area which received the boost dose. The breast usually retains a near normal appearance if the dose of external irradiation does not exceed 50 Gy. How the tumorectomy is performed also plays an essential role in the final cosmetic result. Large excisions, particularly if deep, may cause retraction from scar tissue which is further aggravated by radiation induced fibrosis. It is therefore important that this combined treatment with irradiation and surgery be carried out by members of an oncology team working in close collaboration. It should be noted that any assessment of cosmetic results can only be made after a relatively long period of observation (3 years following treatment).

Local pains of a minor nature and slight limitation of shoulder joint movements are infrequent. This is valid for up to 10 years of observation. It is too early to make the prediction for the remaining life span of the patients.

The incidence of a second primary in the contralateral breast continues to remain low. On an average it does not exceed 6 per cent at 10 years with a plateau being reached at 7 years (Table 12).

In the light of the present satisfactory results the treatment protocol has been modified in an attempt to further refine the indications for tumorectomy (with or without axillary lymph node dissection of limited extent). Tumorectomy before irradiation of T1 lesions is recommended. For T2 lesions tumorectomy before irradiation is also recommended if it is felt that the excision will not adversely affect the cosmetic result (less than and up to 3 cm tumor size). For larger lesions (over 3 cm) the indications for tumorectomy are extended by delivering a preliminary course of external irradiation (45 Gy) and closely monitoring the reduction in tumor size in the hope that the size will decrease to less than 3 cm. The outcome of this preliminary radiation determines the subsequent treatment: (1) If no tumor reduction is noted it is preferable to perform radical surgery or deliver the maximum permissible boost dose of 37 Gy by interstitial therapy; (2) With complete tumor regression as determined clinically and



New treatment protocol for breast carcinoma.

radiologically a boost dose of 25 Gy to the tumor bed by interstitial therapy is adequate; (3) With reduction of tumor size to below 3 cm but without complete regression a simple tumorectomy is recommended followed by a boost of 15 Gy by ^{192}Ir (Figure).

The role of axillary dissection limited to the lymph nodes in the inferior portion of the axilla remains to be defined. It may provide information of prognostic importance in predicting the risk of developing distant metastases and in deciding the indication for adjuvant therapy (hormonal or chemotherapy). However, it has no influence on the local control of lymph nodes since only 1.5 per cent microscopically proven recurrences were detected at 10 years after irradiation alone (T1 and T2). Therefore, it can be stated that radiation therapy alone is capable of controlling nearly all of the micro-metastases in the lymph nodes in the case of T1 and T2 lesions classified as NO and N1a and even in the N1b lesions provided they are of a size less than 2 cm.

SUMMARY

The results of conservative management of breast carcinoma are presented. The disease free survival for patients with T1 lesions was 84 per cent at 5 years, 76 per cent at 7 years and 65 per cent at 10 years, for T2 75, 71 and 64 per cent, and for T3 65, 51 and 45 per cent. The proportion of breasts conserved amongst the patients free of disease at 10 years was 94 per cent for T1, 93 per cent for T2 and 80 per cent for patients with T3 lesions. The cosmetic results were very good for T1 lesions, good for T2 and quite good for T3 lesions. Up to 1981 a simple tumorectomy was carried out in most of the T1 lesions and some of the T2 lesions, followed by radical irradiation. Most of the T2 and T3 lesions were exclusively treated with radical irradiation. In an attempt to improve the cosmetic results, since 1981, the indications for tumorectomy were extended to include some of the T2 lesions, and when possible also some of the T3 lesions, where a tumorectomy is performed before or after irradiation, together with a limited axillary dissection.

ACKNOWLEDGEMENTS

The authors wish to thank the entire Department of Oncology at Hôpital Henri Mondor, particularly the surgical group—A. Germain, M. Julien, A. Bisson, S. Hannoun, J. Lange, C. Thomsen—and the radiotherapy group—F. Baillet, J. P. le Bourgeois, M. Raynal, C. Maylin, M. Salle, J. J. Mazeron, E. Calitchi, M. Martin—and G. Marinello, Ph.D.

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