

**CARCINOMA OF THE BREAST**  
**RESULTS OF SURGICAL TREATMENT WHEN THE CARCINOMA**  
**OCCURRED IN THE COURSE OF PREGNANCY OR LACTA-**  
**TION AND WHEN PREGNANCY OCCURRED SUBSE-**  
**QUENT TO OPERATION (1910-1933)**

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MANY factors influence the prognosis and the results of surgical treatment of patients who have carcinoma of the breast. Some of the more important of these are the presence of other constitutional diseases such as diabetes, exophthalmic goiter, nephritis, *etc.*, the age of the patient, the degree of the malignancy as shown by microscopic examination of the primary lesion, the extent of the malignant involvement at the time of operation, whether the disease is unilateral or bilateral, and the thoroughness with which the radical operative procedure is carried out.

It has been recognized for many years that if carcinoma of the breast occurs when patients are pregnant or lactating, the prognosis is not good.

The purpose of this paper is twofold: (1) To show the results obtained from surgical treatment of carcinoma of the breast if the tumor occurred in the course of pregnancy or lactation; (2) to determine the results if patients had been operated upon for carcinoma of the breast and became pregnant subsequent to the operation.

Statistical studies of the results of surgical treatment of carcinoma of the breast are often misleading and it is difficult to obtain a true evaluation of the results because so many factors influence the prognosis. In order to secure an accurate evaluation of the results it is necessary that the study should include only similar groups of cases. In an attempt to determine the actual results in the various groups, I have recently made a study of all of the cases of carcinoma of the breast in which operation was performed at The Mayo Clinic from 1910 to 1933 inclusive, which comprises a series of 4,628 cases, in 4,506, or 97.1 per cent of which, the patients were traced three years or more. Of this series, in 92 cases, the tumor occurred in the course of pregnancy or lactation and operation was performed either at the time of pregnancy or lactation or soon after. The study was made of 88 patients of this group who were traced for three years or more. The second study comprises 55 patients who were operated upon for carcinoma of the breast and became pregnant subsequent to operation. All of the patients in this group were traced for three years or more. There are five additional cases which belong to both of the former groups and therefore are considered separately. In these five cases the malignancy occurred in the breast in the course of pregnancy or lactation and radical amputation of the breast was done soon afterward. All of these five patients had a subsequent pregnancy.

I should like to express my appreciation to the Division of Biometry and Medical Statistics of The Mayo Clinic for their diligence in searching for these records. The task has taken practically two years and in many instances 10 to 15 letters were necessary to trace an individual patient.

TABLE I

PERCENTAGE SURVIVAL RATES

FOUR THOUSAND, SIX HUNDRED TWENTY-EIGHT CASES OF CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED. 1910-1933: 2,952 (63.8 PER CENT) WITH AXILLARY METASTASES; 1,676 (36.2 PER CENT) WITHOUT AXILLARY METASTASES

Group	Percentage of patients traced* who lived more than indicated years after operation				
	3 yrs.	5 yrs.	10 yrs.	15 yrs.	20 yrs.
Total.....	56.4	43.6	28.9	21.5	16.6
With axillary metastases.....	41.9	28.0	15.6	10.0	7.4
Without axillary metastases.....	82.1	72.1	53.8	42.4	32.6

\* The three year percentage is based on patients traced three or more years after operation, the five year percentage on patients traced five years or more after operation, etc.

I am including a table of the general results obtained from operation in the 4,628 cases, in 4,506 of which the patients were traced three years or more, so that these results can be compared with the results obtained in the two special groups here studied. In Table I are shown the 3, 5, 10, 15 and 20 year results in cases in which operation was performed for carcinoma of the breast. In this table, as in all similar tables in this paper in which percentage survival rates are given, the rates are based in each instance on the total number of patients traced for the period referred to. For instance, the percentage 56.4, which represents the three year results in the total group of patients, is based on the total number of patients operated upon and traced three years or more. The five year percentage is based on the patients who were operated upon and traced five years or more, *etc.* The patients have been divided into two groups: Those who, at operation, were found to have metastases to the axillary lymph nodes and those who, at operation, were found not to have such metastases; invasion of lymph nodes at the time of operation is one of the most important indices to prognosis. It is shown in Table I that the results obtained in those cases in which lymph nodes were not involved at the time of operation were much more satisfactory than were the results in those cases in which metastases to the axillary lymph nodes had occurred.

*Results When Carcinoma Occurred in the Course of Pregnancy or Lactation.*—Of the patients who had carcinoma of the breast associated with pregnancy or lactation, which comprise 92 of the entire series, the average age was 36 6/10 years. The first study was made to determine the percentage of patients who had, and the percentage who did not have, metastases to the axillary lymph nodes at the time of operation (Table II). This table shows that a very high percentage of patients had involved axillary lymph nodes at

the time of operation (84.8 per cent) as compared with the percentage of patients of the entire series who had similar invasion at the time of operation (63.8 per cent).

TABLE II

## ANALYSIS WITH REGARD TO AXILLARY METASTASES

CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933. NINETY-TWO CASES IN WHICH TUMOR WAS PRESENT IN COURSE OF PREGNANCY OR LACTATION

Group	Total		With Metastases		Without Metastases	
	Patients	Per Cent	Patients	Per Cent	Patients	Per Cent
Pregnant at operation.....	11	100	7	63.6	4	36.4
Lactating at operation.....	42	100	38	90.5	4	9.5
Carcinoma developed in course of pregnancy*.....	19	100	17	89.5	2	10.5
Carcinoma developed in course of lactation*.....	20	100	16	80.0	4	20.0
Totals.....	92	100	78	84.8	14	15.2

\* Operation performed soon after pregnancy or lactation.

In Table III are recorded the 3, 5, 10 and 15 year survival rates for patients who were operated upon for carcinoma of the breast which was present in the course of pregnancy or lactation. It is shown by this table that the results of operative treatment are much more satisfactory if axillary metastases were not found at operation than if such metastases were found at operation. Of this latter group no patient lived 15 years while 25 per cent of the patients without involvement of axillary nodes lived 15 years. When this table is compared with Table I it is seen that the results in the subsidiary group were much less satisfactory than those obtained in the entire series.

TABLE III

## PERCENTAGE SURVIVAL RATES

NINETY-TWO CASES OF CARCINOMA OF THE BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933; TUMOR WAS PRESENT IN COURSE OF PREGNANCY OR LACTATION: 78 (84.8 PER CENT) WITH AXILLARY METASTASES; 14 (15.2 PER CENT) WITHOUT AXILLARY METASTASES

Group	Percentage of patients traced* who lived more than indicated years after operation			
	3 yrs.	5 yrs.	10 yrs.	15 yrs.
Total.....	23.9	14.5	8.7	4.5
With axillary metastases.....	17.3	5.7	3.4	0
Without axillary metastases.....	61.5	61.5	40.0	25.0

\* The three year percentage is based on patients traced three or more years after operation, the five year percentage on patients traced five years or more after operation, etc.

A more detailed study was made of the cases in which the tumor was present in the course of pregnancy or lactation. They were divided into two main groups: Those in which there was invasion of lymph nodes at the time

of operation (Table IV) and those in which there was no such invasion at the time of operation (Table V). Each of these groups was then subdivided into four subgroups: (1) Those in which the patients were pregnant at the time of operation; (2) those in which the breast was lactating at the time of operation; (3) those in which the patient stated that the tumor developed in the course of pregnancy and the patient was operated upon later; and (4) those in which the tumor developed in the course of lactation and the patient was operated upon at a subsequent time.

TABLE IV

PERCENTAGE SURVIVAL RATES

CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933. CASES IN WHICH TUMOR WAS PRESENT IN COURSE OF PREGNANCY OR LACTATION. SEVENTY-EIGHT CASES WITH AXILLARY METASTASES

Subgroup	Percentage of patients traced* who lived more than indicated years after operation			
	3 yrs.	5 yrs.	10 yrs.	15 yrs.
Pregnant at operation.....	14.3	0	0	0
Lactating at operation.....	16.7	2.9	3.3	0
Tumor developed in course of pregnancy; operation later.....	18.8	6.2	0	0
Tumor developed in course of lactation; operation later.....	18.8	14.3	7.1	0
Totals.....	17.3	5.7	3.4	0

\* The three year percentage is based on patients traced three or more years after operation, the five year percentage on patients traced five or more years after operation, etc.

In Table IV, previously referred to, are given the results obtained in the four different subgroups of those patients whose lymph nodes were invaded at the time of operation. It is shown in this table that the results of operative-treatment were much less satisfactory in cases in which the tumor developed in the course of pregnancy and the patients were operated on either while the pregnancy was in progress or at a later time, than they were in those cases in which the tumor occurred in the course of lactation and the patient was operated upon at that time or at a later time. The poorest results were obtained in those cases in which the patient was pregnant at the time of operation, for of all of these patients, none lived more than five years. The best results were obtained in those cases in which the tumor developed in the course of lactation and the patients were operated upon at a subsequent time.

In Table V are given the results obtained in the four different subgroups composed of cases in which there was no invasion of lymph nodes at the time of operation. This table shows that the operative results are more satisfactory if the tumor was present in the course of pregnancy, whether the operation was performed at the time of the pregnancy or at a subsequent time. Although this group of 14 cases is small, the results are gratifying from a surgical standpoint; it is evident that surgical treatment in these cases is by no means hopeless and in fact is fairly satisfactory. It is unfortunate that this group

is not larger but it emphasizes the importance of early operation before metastases have occurred.

TABLE V

PERCENTAGE SURVIVAL RATES

CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933. CASES IN WHICH TUMOR WAS PRESENT IN COURSE OF PREGNANCY OR LACTATION. FOURTEEN CASES WITHOUT AXILLARY METASTASES

Subgroup	Percentage of patients traced* who lived more than indicated years after operation			
	3 yrs.	5 yrs.	10 yrs.	15 yrs.
Pregnant at operation.....	75.0	75.0	66.7	50.0
Lactating at operation.....	33.3	33.3	0	0
Tumor developed in course of pregnancy; operation later.....	100.0	100.0	50.0	50.0
Tumor developed in course of lactation; operation later.....	50.0	50.0	33.3	0
Totals.....	61.5	61.5	40.0	25.0

\* The three year percentage is based on patients traced three or more years after operation, the five year percentage on patients traced five or more years after operation, etc.

Because of the poor prognosis, I have made a study to determine the grade of malignancy which was present (Table VI). This definitely shows that malignancy which occurs in the course of lactation or pregnancy tends to be of high grade and that is why such a high percentage of patients present involvement of lymph nodes at the time of operation. The malignancy of none of the growths was of Grade 1 and in 59.8 per cent of the cases it was of Grade 4.

TABLE VI

ANALYSIS ACCORDING TO GRADE OF MALIGNANCY

CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933. NINETY-TWO CASES IN WHICH TUMOR WAS PRESENT IN COURSE OF PREGNANCY OR LACTATION

Group	Grade of Malignancy											
	Total		1		2		3		4		Not Stated	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Pregnant at operation	11	100	0	—	1	9.1	5	45.5	3	27.3	2	18.2
Lactating at operation	42	100	0	—	1	2.4	7	16.7	29	69.0	5	11.9
Carcinoma developed in course of pregnancy.....	19	100	0	—	1	5.3	4	21.1	11	57.9	3	15.8
Carcinoma developed in course of lactation.....	20	100	0	—	2	10.0	4	20.0	12	60.0	2	10.0
Totals.....	92	100	0	—	5	5.4	20	21.7	55	59.8	12	13.0

The 11 patients who were pregnant at the time of operation were studied to determine if they were delivered of babies at full term or if the operation

was followed by miscarriages. It was found that six patients were delivered of live babies at full term; one patient had twins at full term and four patients had miscarriages following the operation. The four miscarriages occurred in the first two months following operation and the births occurred as follows: One in the second month, four between the third and fourth months, and the twins were born five months after operation.

The cases were then studied to determine whether or not the babies were nursed from the breast while the tumor was present. In 60 cases it was definitely stated that the babies had nursed from the breast for varying periods of time and in six cases it was definitely stated that they had not. In the remaining 26 cases there was no definite statement as to whether or not the babies had nursed from the breast.

**SUMMARY.**—Carcinoma of the breast which occurs in the course of pregnancy or lactation is usually of a high grade of malignancy; metastases to the axillary lymph nodes take place early, and the results of operation are not as satisfactory as in cases in which the tumor is not associated with pregnancy or lactation. However, operative treatment is by no means hopeless; on the contrary, results of operation are satisfactory. If the operation is performed before axillary metastases have occurred, the results are much more satisfactory than in those cases in which invasion of lymph nodes is found at the time of operation.

*Results When Pregnancy Occurred After Amputation of the Breast.*—Because of the increasing frequency of occurrence of carcinoma of the breast in the course of the child-bearing period of life, a study was made to determine the results in cases in which amputation of the breast had been performed and the patients became pregnant subsequent to operation. Fifty-five patients between the ages of 18 and 44 gave birth subsequent to the operation. The average age of these patients was 34  $\frac{2}{10}$  years; the youngest patient was age 18 and the oldest was 43. Of this group, 27 patients had a single livebirth; ten patients had two livebirths; two patients had three livebirths; three patients had a single stillbirth; 12 patients had a single miscarriage, and one patient had two miscarriages.

A study was made to determine the interval of time from operation to the first subsequent birth (Table VII). It is shown that the shortest interval between operation and the birth of a live baby at full term was about eleven and one-half months and the longest interval was about twelve and one-half years. In 22 of the 39 patients having livebirths, the births occurred between one and three years following operation.

A study of these 55 cases was then made to determine the percentage of patients with and without axillary involvement and the number of patients represented by the four grades of malignancy (Table VIII). This study is of interest because of the high percentage (54.5) of cases in which involvement of lymph nodes was not found at the time of operation. This is higher than the percentage of cases (36.2) in which involvement of lymph nodes was not found among all cases of carcinoma of the breast in which operation was per-

formed in the same periods. This study is also of interest because of the relatively large number of patients whose carcinomata were of grades of malignancy 1 and 2. These factors indicate a more favorable prognosis than that in all cases in which operation was performed.

TABLE VII  
INTERVAL FROM OPERATION TO FIRST SUBSEQUENT BIRTH  
CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933.  
FIFTY-FIVE PATIENTS WHO BECAME PREGNANT AFTER OPERATION

Interval	Total Patients	Live-births	Still-births	Miscarriages	Character Unknown
9-10 months.....					
11-12 months.....	1	1			
1-2 years.....	13	11	1	1	
2-3 years.....	15	11		4	
3-4 years.....	6	4		1	1
4-5 years.....	3	2		1	
5-6 years.....	1	1			
6-7 years.....	2	2			
8-9 years.....	2	1		1	
9-10 years.....	1	1			
12-13 years.....	1	1			
Unknown.....	10	4		5	1
Totals.....	55	39	1	13	2

TABLE VIII  
GRADE OF MALIGNANCY  
CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933.  
FIFTY-FIVE PATIENTS WHO BECAME PREGNANT AFTER OPERATION

Group	Total	Per cent	Grade of Malignancy				
			1	2	3	4	Not Stated
Totals.....	55	100.0	4	8	15	11	17
With axillary metastases..	25	45.5	1	2	11	9	2
Without axillary metastases.....	30	54.5	3	6	4	2	15

These 55 cases were then studied to determine the length of survival from the time of the operation. The series was divided into two groups: (1) Those patients who presented metastases to the axillary lymph nodes; and (2) those who did not present such metastases at the time of operation. The number of patients traced and living, as well as the percentage of cases, is given in each of the 3, 5, 10 and 15 year periods (Table IX). This was thought advisable because the percentages are often misleading when dealing with relatively small groups of cases. As is shown, the results were exceptionally good. This is a very interesting study as the results are much more satisfactory than would be expected for this group of cases. It must be understood that this is of necessity more or less a selective group of cases, because patients who have more serious types of malignant disease do not survive long enough to become pregnant subsequently; and it is evident

that more than half of the patients did not present axillary metastases, as well as that there was a relatively high percentage of low degrees of malignancy in this group of cases. I wish to state again that this comprises all of the cases of the designated period in which it was possible to obtain information of pregnancy having occurred subsequent to operation.

TABLE IX

SURVIVAL RATES AFTER OPERATION

CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933.  
FIFTY-FIVE PATIENTS WHO BECAME PREGNANT AFTER OPERATION

Group	Lived 3 or More Yrs.		Lived 5 or More Yrs.		Lived 10 or More Yrs.		Lived 15 or More Yrs.					
	Pa- tients Traced	Pa- tients	Per Cent of Traced Pa- tients	Pa- tients Traced	Pa- tients	Per Cent of Traced Pa- tients	Pa- tients Traced	Pa- tients	Per Cent of Traced Pa- tients	Pa- tients Traced	Pa- tients	Per Cent of Traced Pa- tients
Totals.....	55	52	94.5	53	42	79.2	37	28	75.7	21	15	71.4
With axillary metastases.	25	22	88.0	23	13	56.5	12	6	50.0	5	3	60.0
Without axillary metastases.....	30	30	100.0	30	29	96.7	25	22	88.0	16	12	75.0

These 55 cases were then studied to determine the length of survival after the first birth following operation. Of the 55 cases, in 45 the time of the subsequent birth was definitely determined. In ten cases it was known that birth had occurred subsequent to operation but it was impossible to determine the exact time of the birth; therefore these cases cannot be included in the record of survivals. Because of the relatively small number of cases it was thought best to tabulate this group under traced patients and patients living in the different periods. The results of this study are shown in Table X.

TABLE X

SURVIVAL AFTER FIRST BIRTH SUBSEQUENT TO OPERATION

CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933.

FIFTY-FIVE PATIENTS WHO BECAME PREGNANT AFTER OPERATION:

TWENTY-FIVE WITH AXILLARY METASTASES, THIRTY WITHOUT AXILLARY METASTASES

Group	Intervals after First Birth Subsequent to Operation											
	1 Yr. or More		2 or More		3 or More		5 or More		10 or More		15 or More	
	Traced	Lived	Traced	Lived	Traced	Lived	Traced	Lived	Traced	Lived	Traced	Lived
Totals.....	45	41	44	34	41	30	37	28	22	14	14	8
With axillary metastases.....	21	17	20	12	17	8	14	8	4	2	4	1
Without axillary metastases.....	24	24	24	22	24	22	23	20	18	12	10	7

This table shows that of the 45 patients mentioned, who were operated upon for carcinoma of the breast and who gave birth subsequently, 41 survived one year or more after the birth, and of the 14 patients who had given birth 15 or more years previous to the time of inquiry, eight had survived.

The preceding tabulation (Table X), applying to the entire group of 55



cases, includes 42 patients who had had babies at full term and 13 patients who had had miscarriages. A study was then made of the 42 patients who had babies only at full term. Of these 42 patients, 39 had live babies and three had stillbirths. It was found that 19 or 45.2 per cent of these patients had axillary metastases at the time of operation and 23, or 54.8 per cent, had no such metastases at the time of operation. Of the 42 patients, 37 were definitely traced; 12 patients stated that they had nursed the baby, seven did not nurse from the breast and in 18 cases definite information on this point was not obtained.

TABLE XI

## SURVIVAL AFTER FIRST BIRTH SUBSEQUENT TO OPERATION

## CARCINOMA OF BREAST IN WHICH OPERATION WAS PERFORMED, 1910-1933.

## FORTY-TWO PATIENTS WHO WERE DELIVERED AT FULL TERM AFTER OPERATION:

## NINETEEN WITH AXILLARY METASTASES, TWENTY-THREE WITHOUT AXILLARY METASTASES

Group	Intervals after First Birth Subsequent to Operation											
	1 Yr. or More		2 or More		3 or More		5 or More		10 or More		15 or More	
	Traced	Lived	Traced	Lived	Traced	Lived	Traced	Lived	Traced	Lived	Traced	Lived
Totals.....	37	33	37	29	35	26	31	24	18	12	12	7
With axillary metastases.....	16	12	16	10	14	7	11	7	3	2	3	1
Without axillary metastases.....	21	21	21	19	21	19	20	17	15	10	9	6

In Table XI are given the survivals from one to 15 or more years after the birth of a baby at full term by patients who previously had undergone amputation for carcinoma of the breast between the years 1910 and 1933. Tables X and XI differ in that Table XI excludes miscarriages. This table shows that of the 37 traced patients, 33 lived one or more years after the birth of the baby and of the 12 patients who had had live babies 15 or more years previously, seven were living 15 or more years after the birth of the baby. These results are surprisingly good. The chief value of this study is to establish the fact that patients who have been operated upon for malignant disease of the breast can survive the birth of a child for 15 years or more; in fact one of these patients lived 20 years. This study in no way establishes what the results of operation would have been if the pregnancy had not occurred, as this can be determined only by comparing similar groups of patients who have survived in the different age periods and have not had a subsequent pregnancy. This comparative study is being made and will be of interest as this group of cases becomes larger.

*Five Cases Which Presented Features of Both of the Foregoing Groups.—*

The following five cases I have segregated into a separate group, inasmuch as they belong in both of the preceding groups and could not be included in either one separately. The group is so small that it is difficult to summarize; therefore, I am here presenting a brief report, in abstract, of each of the five cases. They are of interest because of the long survival of some of the patients who had many pregnancies; in all of these cases the carcinoma of the breast was present in the course of the pregnancy and all of the patients had one or more pregnancies subsequent to the operation.

CASE REPORTS

**Case 1.**—The patient was 31 years of age. The tumor was noted in the course of lactation and three and one-half months later the patient underwent radical amputation of the breast. She had a subsequent livebirth four years and nine months after operation; she lived ten and three-fourths years after operation and six years after birth of the child.

**Case 2.**—The patient was 34 years of age. The tumor of the breast was noted one month after she had weaned the child. Radical amputation was performed six weeks later. Nine months after operation the patient had the first livebirth and two years and eight months after operation she had a second livebirth. Ten months after birth of the second child, radical amputation of the remaining breast was effected. The patient's duration of life was nine and one-half years dating from the first operation and five years dating from the second operation.

**Case 3.**—The patient was 30 years of age. The tumor was noted in the course of lactation. Radical amputation was performed two and one-half months after she had weaned the child. The patient had a livebirth one year and nine months after operation. The mother is living four and one-half years after operation.

**Case 4.**—The patient was 31 years of age. The tumor was noted in the course of pregnancy, two years before radical amputation of breast. A second pregnancy occurred after operation; the character of this subsequent pregnancy could not be determined. The patient died about the time of the second birth, one year and nine months after operation.

**Case 5.**—The patient was 28 years of age. The tumor was noted in the course of pregnancy. Local excision of the tumor was performed in the course of the pregnancy and the patient had a miscarriage at eight months. Radical amputation of the breast was performed at the clinic one month after the miscarriage. She then had one subsequent miscarriage and one subsequent livebirth. The patient died about the time of the birth.

**SUMMARY.**—A complete study has been made of all of the cases of carcinoma of the breast in which operation was performed at The Mayo Clinic between 1910 and 1933. Of this entire group special studies were made on two series of cases: (1) Cases in which the malignancy was present in the course of lactation or pregnancy; and (2) cases in which pregnancy occurred subsequent to radical amputation of the breast.

The first special study was made on a group of 92 cases, to determine the results of operative treatment and it was found that the results of operation in these cases were not as satisfactory as they were in the entire series of cases in which operation was performed from 1910 to 1933. The results indicate that the condition is by no means hopeless and in those cases in which invasion of lymph nodes had not occurred at the time of operation, the results were satisfactory.

The second special study was made in a group of 55 cases. The 3, 5, 10 and 15 year survivals from the time of operation were determined. The survivals following the birth of the first baby were determined from one to 15 years after the birth of the baby. Of the 37 patients of the second series, who were traced, 33 lived one or more years after the birth of the baby and of 12 patients whose babies were born 15 years or more before the time of the inquiry, seven had survived. This group is of particular interest because it establishes the fact that patients can survive many years following child-birth and may have as many as three births following operation for carcinoma of the breast. The operative results in this group were satisfactory and the

final results were found to be more satisfactory than those of the entire series. It is difficult, and may be hazardous, to draw any definite conclusions from this study other than what has been stated above; namely, that it is possible for patients to bear children following radical amputation of the breast and to live for many years without recurrence of carcinoma of the breast. However, I do not believe that it should be inferred from this study that pregnancies subsequent to radical amputation may not be followed by metastatic malignancy because it must be remembered that these cases in reality constitute a selected group, inasmuch as all patients who give birth to children at full term must have survived operation approximately a year and usually patients who survive so long are in good general condition, which eliminates many of the patients whose malignancy is of high grade. This unintentional selectivity increases by necessity as the interval increases from the time of operation. Although the results in this series were far better than it was expected they would be, we shall continue to advise young women who are in the child-bearing period of life not to have subsequent pregnancies. It is gratifying, however, to know that if pregnancy does develop subsequent to radical amputation, the patient may give birth to babies at full term and that metastatic malignancy may not develop as a consequence. In these cases the prognosis is probably more favorable if the patient does not nurse the baby.