breast volume. In other instances the doctor and the patient wished to delay operation until the conclusion of pregnancy for a number of emotional or religious reasons.

The patients who became pregnant at some time after mastectomy all did so within four years or less. Since more than two thirds of this group of patients had no axillary metastases, we feel that there has been some selection in regard to the patients who became pregnant after mastectomy. The results have been so good that we feel that the condition of the patient rather than the time interval since operation should determine whether or not the patient should be allowed to become pregnant again.

Although abortion, spontaneous or induced, did occur in six patients, we do not feel that any definite benefit could be shown secondary to this event.

CONCLUSIONS

1. About one-third of patients who develop breast cancer during the childbearing period will have pregnancy as a complication during or after the occurrence of the disease.

2. Patients treated during pregnancy or nursing without spread of the disease beyond the breast have a prognosis similar to that of uncomplicated series.

3. Patients with spread of their disease are usually in a very advanced state of disease due to delay in treatment.

4. Although there appears to be some natural selection of cases, the prognosis of patients who became pregnant after operation appears to be unusually good, while the interval between operation and pregnancy does not appear to be important. Recurrence occurred only once and a new tumor once in the other breast in such instances.

5. Abortion cannot be shown to have any definite influence on the course of the disease.

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DR. STUART W. HARRINGTON, Rochester, Minn.: I compliment Dr. White upon his excellent presentation and for bringing before the Association this analysis of records of patients treated by radical mastectomy during pregnancy and lactation, and patients who became pregnant subsequent to radical mastectomy done for carcinoma of the breast. Dr. White has requested me to discuss his paper, which I am pleased to do, because it deals with subjects in which I have been greatly interested for a number of years. The importance of these subjects is evidenced by the fact that there is considerable difference of opinion in the profession as to the management of the patients concerned. Some surgeons have considered the presence of pregnancy or lactation to be a contraindication to radical surgical treatment for carcinoma of the breast; some surgeons advise delay of surgical treatment until after delivery of the child or termination of the pregnancy. I believe that the radical operation should be carried out immediately upon establishment of the diagnosis of carcinoma of the breast, whether during pregnancy or lactation, and that in such cases the usual methods for the establishment of a definite diagnosis by biopsy should be followed immediately by radical surgical treatment, if the lesion proves to be malignant.

As for patients who have undergone radical mastectomy for carcinoma of the breast and who are in the childbearing period of life, there is great difference of opinion in the profession as to the advisability of subsequent childbirth for them.

As Dr. White has said, these are entirely different subjects. I shall first discuss our results of treatment of carcinoma of the breast during pregnancy and lactation. Our results differ from those of Dr. White in that they have been better after radical mastectomy done for patients whose carcinoma was recognized and treated during pregnancy than they were when the lesion was treated surgically during lactation. Our results are similar to his in that when axillary nodal metastasis was not found at the time of operation, the

patients remained much better than those in whom the axillary nodes were found to be involved at operation. However, I do not believe that the results obtained when the axillary nodes were not involved can be considered as favorable as those achieved after radical mastectomy for carcinoma of the breast in the absence of coexisting pregnancy or lactation. It is probable that the results would be similar if it were definitely known that there was no metastasis from the carcinoma in the breast, but many patients have distant metastasis not manifested by axillary metastasis at the time of operation.

As for patients who have undergone radical mastectomy and subsequently become pregnant, the results of Dr. White's studies are similar to ours. That is, the survival rates among these patients are very good, an occurrence which in some respects is difficult to explain. When I first studied this group of patients, more than 20 years ago, I was surprised to find that the results were so satisfactory. I thought some error in classification might have taken place so I reviewed the records several times over a period of 2 years before I published the results in 1936. I noted, as Dr. White has noted in his study, that the results achieved for these women were better than those obtained for women who subsequently did not become pregnant. The good results in the cases in question probably are due to a natural selectivity, and each year that these patients live beyond the time of the radical mastectomy without evidence of recurrence places them in a more select group. It was also found that among these patients the incidence of low-grade lesions (grades 1 and 2) was higher, and that in only 39 per cent of cases were the axillary nodes found to be involved at the time of operation. By comparison, this percentage is 57 in respect to all cases (8,796) in which operation was done between the years 1910 and 1949.

I think the value of this study lies in establishing the fact that patients who have undergone radical mastectomy for carcinoma of the breast can survive the birth of a child for many years without demonstrable metastatic disease. Actually, some of our patients have had two and three children after undergoing radical mastectomy. It may be hazardous to draw any definite conclusions from this study, other than to observe that it is possible for patients to bear children after radical mastectomy and to live for many years without recurrence of the carcinoma of the breast. However, I do not believe it is advisable to infer from this study that pregnancy after radical mastectomy may not be followed by metastatic malignant lesions, for metastasis does develop in patients in whom axillary metastasis was not found at the time of operation. More often, of course, metastatic spread does take place in those in whom metastasis to axillary nodes was proved at the time of operation.

I again wish to compliment the Drs. White upon their excellent paper.

DR. ALSON R. KILGORE, San Francisco, California: It is gratifying to find our own impressions confirmed both by the study by Dr. White and his father, and by Dr. Harrington, that cancer of the breast in association with pregnancy is by no means always hopeless.

I am sure many of us also will be glad to have the conclusion of Dr. White, when we are faced with the problem of deciding about interrupting the pregnancy, that abortion appears to have little, if any, effect upon the course of the disease.

The third question of whether a woman after a radical mastectomy should be advised to have pregnancy if she desires is presented to us much more often, in fact, with many of our patients who are operated on for breast cancer during the child-bearing age.

I would offer only one comment, perhaps of a somewhat philosophical rather than scientific nature. After we have done a radical mastectomy on a patient, even if we find her axillary glands uninvolved, she still has by no means a 100 per cent chance of complete freedom from recurrence. Her chances of living out her normal life span are substantially less than normal.

The child who loses his mother, loses his most priceless birthright. I would by no means venture to suggest an answer to the question of what bearing this fact should have upon our decision, complicated as it is by ethical and emotional and frequently religious aspects; but nevertheless it is a fact, and it deserves consideration.

A woman who is found to have axillary metastases, and who later becomes pregnant, is highly likely to leave her child for somebody else to raise. Even the woman who is found to be in stage I, if she is to have a child later, might possibly be well advised to wait until two or three years have gone by and have proved her free so far of recurrence.

DR. HERBERT WILLY MEYER, Rancho Santa Fe, California: It is a pleasure and a thrill to me to discuss a paper of such importance, presented by father and son. William Crawford White has contributed much to the treatment of carcinoma of the breast. It is wonderful that his son should follow in his footsteps.

Dr. White has drawn to our attention the importance of early suspicion and adequate histologic diagnosis, especially in cases of cancer of the breast complicated by pregnancy and nursing.

Speaking of efficient treatment, I had an opportunity to attend a meeting at the Naval Hospital in San Diego early this March, when Dr. McWhirter of Edinburgh was the guest speaker. He stated that in his series of breast cancer cases complicated by pregnancy and treated by simple mastectomy, followed by irradiation, there was a five-year survival rate of 39 per cent. He did not state the number of patients he had treated.

He made this amazing remark: "They are not interested, in Edinburgh, in the cure or survival

rates—they are only interested in whether a patient is alive or dead."

It has been shown by Lauren Ackerman and others that in many instances live cancer cells are held imprisoned in the fibrous tissue of lymph nodes treated by irradiation. These cancer cells are just waiting for their opportunity to break forth from the prison and cause local recurrence and spread of this dread disease.

I most heartily agree with Dr. White that the really efficient treatment of cancer of the breast complicated by pregnancy or lactation must be an adequate, efficient standard radical mastectomy. It seems such a pity that a young woman without evidence of node metastasis should be deprived of the opportunity of long-time survival following radical mastectomy when McWhirter's teaching is followed.

Concerning pregnancy following radical mastectomy, we have followed these principles: If there are no lymph node metastases, the patient may contemplate pregnancy at an early date. If lymph nodes are involved, we advise waiting with pregnancy until at least three years have elapsed without reappearance of the disease. Sometimes in advanced cases of the disease we even advise therapeutic abortion of early pregnancy follow radical mastectomy.

Dr. White has shown statistically that our advice may have been too radical. This is another reason why his paper is so important.

I shall never forget a remark made by Stuart Harrington some years ago in San Francisco when we were discussing cancer of the breast. He said, "We assume a great responsibility when we advise a patient to undergo a radical mastectomy. We assume a still greater responsibility when we refuse to perform one." How wise his remark was!

I wish to thank Dr. White and his son for bringing this important subject to our attention.