TUMORS OF THE BREAST

MAX CUTLER

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Their Pathology, Symptoms, Diagnosis and Treatment

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To my friend

ARNOLD S. KIRKEBY

A man of genius, generosity and integrity
with deep respect and affection

Preface

For several years I had the honor of collaborating with Sir Lenthal Cheatle of London in the preparation of the book published in 1931 under the title of *Tumours of the Breast*.

As stated in the preface, that book was the outcome of Cheatle's 35 years' study of normal and abnormal conditions of the breast. The results were obtained from combined clinical and microscopic researches, and the opinions expressed were based on the examination of whole microscopic and serial sections made from entire mammary glands. The reviews of the book stressed that its outstanding value lay in the fact that almost the whole of it was based on original observations.

The purpose of the author in this book is to add to Cheatle's studies my personal experience based on some 10,000 records of diseases of the breast which I have studied during the last 30 years. The special purpose is to make accessible to the reader a critical evaluation of the pertinent facts in the etiology, the pathology, the diagnosis, the prognosis and the treatment of breast tumors.

In a survey of the literature an effort has been made to separate the evidence which appears sound from that which cannot withstand critical analysis. This effort has led to the clarification of some of the confusing and controversial aspects of the problem.

Progress in the field of breast cancer in the last three decades consists essentially of a better understanding of the natural history of the disease. The most active phase of the problem relates to the hormones, both with respect to etiology and treatment.

The chapters on Anatomy and Physiology have been completely rewritten. Special sections added include "The Effects of Pregnancy and Lactation on the Prognosis of Breast Cancer," "Bilateral Breast Cancer," "Rare Tumors," "The Question of Simple Mastectomy" and "Extended Radical Surgery." A new chapter on "Hormones" has been added.

In 1931 Cheatle received the Walker Prize awarded by the Royal College of Surgeons of England for his researches on this subject.

Our happy association was resumed in 1938 when Cheatle joined me in the Chicago Tumor Institute where for several years we attempted to correlate the varied clinical manifestations of breast cancer with the different gross and histologic patterns that we had described and published.

In 1951 the British Medical Journal had this to say on the death of Sir Lenthal Cheatle:

> One of the few remaining links with Lister is broken by the death, on January 2, of Sir Lenthal Cheatle, who had been identified with King's College Hospital—Lister's London Hospital—for well over half a century and in fact Cheatle assisted him in the last operation that he performed. . . .

Cheatle's researches on the pathology of breast tumors are so basic that their results have stood the test of time and retain, even today, all their validity. Because of this fact I have felt that a useful purpose might be served by calling fresh attention to some of the more significant aspects of his researches, especially those dealing with the highly important problem of precancerous lesions in the breast.

It is with special pleasure that I express my enduring gratitude to my wife Bobbie for her never-failing inspiration, quiet faith and amazing sympathy which eased the way and made this task possible.

To my friend Dr. Monty M. Bernstein I am deeply grateful. If it had not been for his repeated hints and reminders, for his constant proddings and finally for his exercise of a gentle but unremitting and, in the end, irresistible pressure, I never should have overcome my reluctance to undertake the enormous task of writing this book. Amid the toils and tribulations of that task, I have enjoyed his friendship, counsel and encouragement.

I desire to express my thanks to Sister Mary David and her Staff for undertaking the sponsorship of this work under the auspices of the Research Foundation of Saint John's Hospital.

Mr. and Mrs. Alfred Rooney deserve special praise; to my secretary Mrs. Rooney I am indebted for her patient attention to the myriad of details incident to the preparation of the manuscript. To Alfred Rooney I am grateful for his editorial assistance and painstaking care of the bibliography executed with diligence and efficiency.

To Miss Alice Galskis and Mrs. Edith S. Moore I am indebted for their skillful library and research labors, and to Mrs. C. S. Olsen for her meticulous typing of the manuscript. My thanks are due to Mr. Joseph M. Yuhasz for his care and skill in the photography and the illustrations so faithfully reproduced. To J. B. Lippincott Company I express my hearty appreciation for undertaking this publication.

Finally, it is with much pleasure that I record my deep gratitude to Mr. Arnold S. Kirkeby, a true friend, without whose sustained interest, confidence and support this work could not have been accomplished.

MAX CUTLER

Beverly Hills, California
April, 1961

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CHAPTER 1

Anatomy of the Breast

The mammary gland is an accessory organ of the reproductive system. Its function is to secrete milk for nourishment of the infant. Mammary glands are unique to the highest class of vertebrate animals known as mammals. Structurally and embryologically, however, the mammary gland is related to the glands of the integument and anatomically is located between the superficial layers of fascia.

The breast in the adult woman refers to the eminence on the anterior chest wall which may assume a conical, discoidal or hemispherical shape. It is present in rudimentary form in infants, children and men. In the adult nullipara the breast extends from approximately the second to the sixth or the seventh rib and from the lateral border of the sternum to the axilla. The "tail of the breast" sometimes extends into the axilla, in which case it may be difficult to distinguish between axillary lymphadenopathy and a primary breast lesion.

The breast contains the mammary glandular tissue as well as considerable adipose and connective tissue which fills in between and around the glandular tissue. The glandular tissue is entirely contained between the superficial and the deep layers of the superficial fascia. Between the deep layer of the

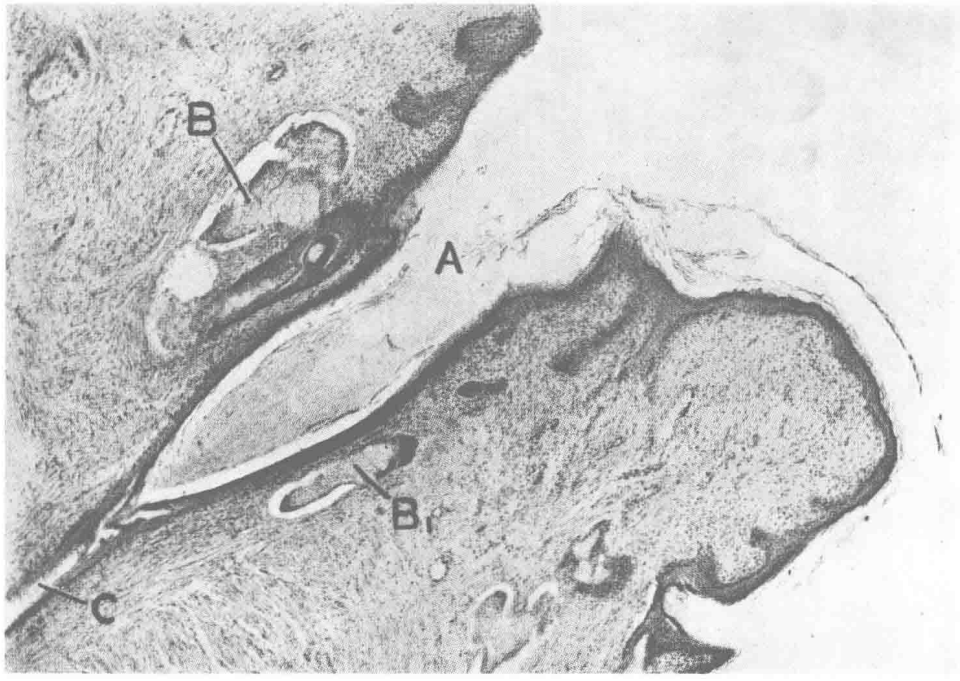

FIG. 1. Low-power photomicrograph of the opening of a duct on the surface of the nipple. (A) A duct-opening containing a plug which consists of desiccated epithelial cells and sebum. (B and B_1) Laterally situated sebaceous glands whose ducts end in the mammary duct opening (A). (C) Continuation of the mammary duct opening. The layer of squamous epithelium is becoming thinner at this point and is neither squamous nor columnar in type; it may be described as being transitional. Above this point it is definitely squamous, and below it becomes definitely columnar. The patent lumen of the duct (C) is well seen. (Cheatle, G. L., and Cutler, M.: Tumours of the Breast, Philadelphia, Lippincott)

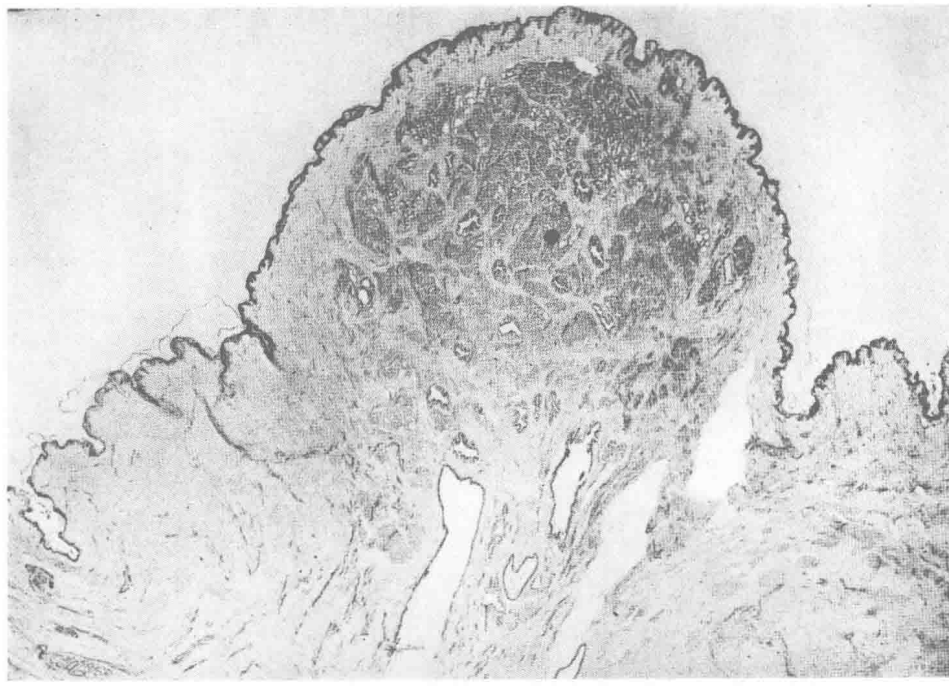

FIG. 2. Low-power photomicrograph of the nipple reproduced from the breast of a female aged 34 years in the third month of lactation (see also Fig. 3). (Cheatle, G. L., and Cutler, M.: Tumours of the Breast, Philadelphia, Lippincott)

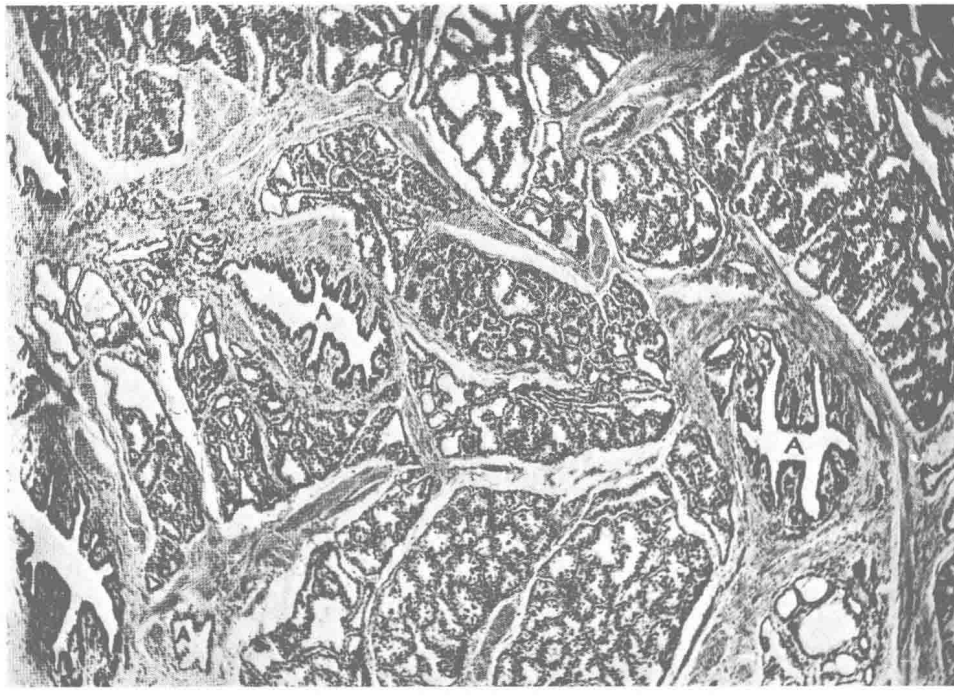

FIG. 3. Section of the nipple shown in Figure 2 under higher magnification. (A) Ducts cut transversely. The rest of the photomicrograph contains newly formed lobules of acini, which form the chief parts comprising the nipple structure. (Cheatle, G. L., and Cutler, M.: Tumours of the Breast, Philadelphia, Lippincott)

superficial fascia and the deep investing fascia of the pectoralis major muscle is a fascial cleft, the retromammary space, which allows considerable mobility of the breast over the underlying chest wall.

THE NIPPLE

The nipple projects from the surface of the breast as a conical or cylindrical structure at about the level of the fourth intercostal space just below the center of the breast. It is covered by a layer of epidermis which is continuous with the openings of the 15 to 20 lactiferous ducts which end on its surface. Sebaceous glands also open on the surface of the nipple (Fig. 1); sometimes these are enormous in number, while in other cases only a few can be observed. The skin of the nipple is pigmented and wrinkled in appearance and extends radially for 1 or 2 cm. to form the areola. When at rest, the main mass of the nipple consists of bundles of unstriated muscle fibers through which the ducts pass to reach the surface. During lactation the nipple becomes crowded with acini, resulting in enlargement of this structure (Figs. 2 and 3). The areola is roughened by the presence of numerous small sebaceous glands which appear as small elevations on its surface. In the subcutaneous tissue of the areola there are circular and radially placed smooth muscle bundles which cause prominence of the nipple in response to stimulation.

The color of the nipple and the areola is pink to brown in the nullipara. It becomes progressively darker during pregnancy, at which time the nipple and the areola also increase in size. Following lactation, the increased pigmentation subsides but not to that observed in the nullipara so that the degree of pigmentation can often be used as a means of differentiating nulliparous from parous women.

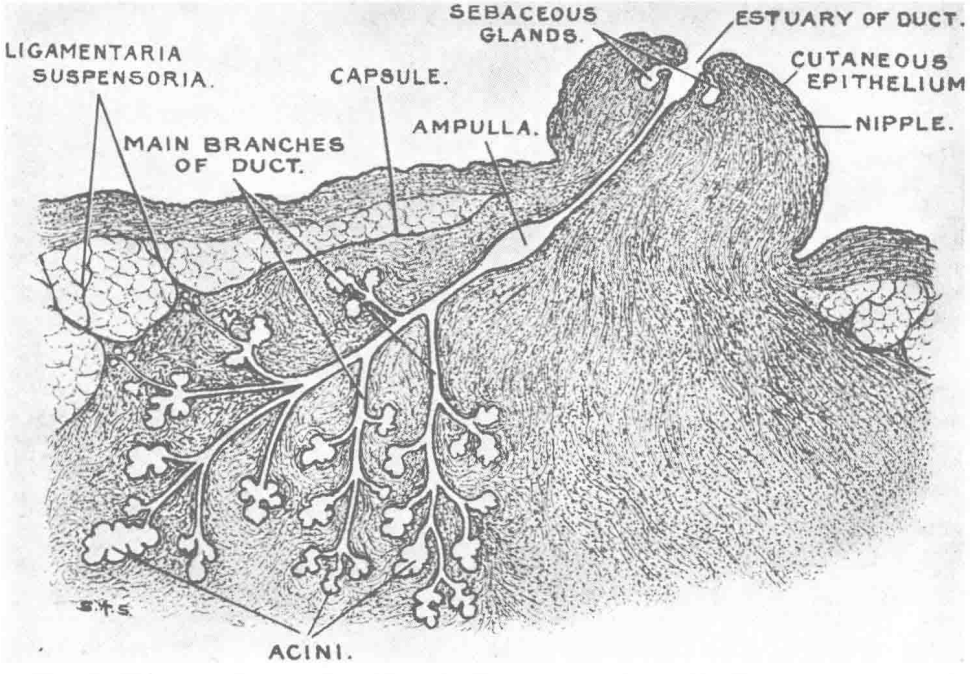

FIG. 4. Diagram showing the chief distribution of a duct. The ligamenta suspensoria are formed by the capsule of the breast, and into their bases breast tissue is prolonged. Increase in the density of the breast at these points might give rise to a fine multinodularity on palpation if the superjacent fat were nearly or quite absent. In some instances there is little or no superjacent fat. (Cheatle, G. L., and Cutler, M.: Tumours of the Breast, Philadelphia, Lippincott)