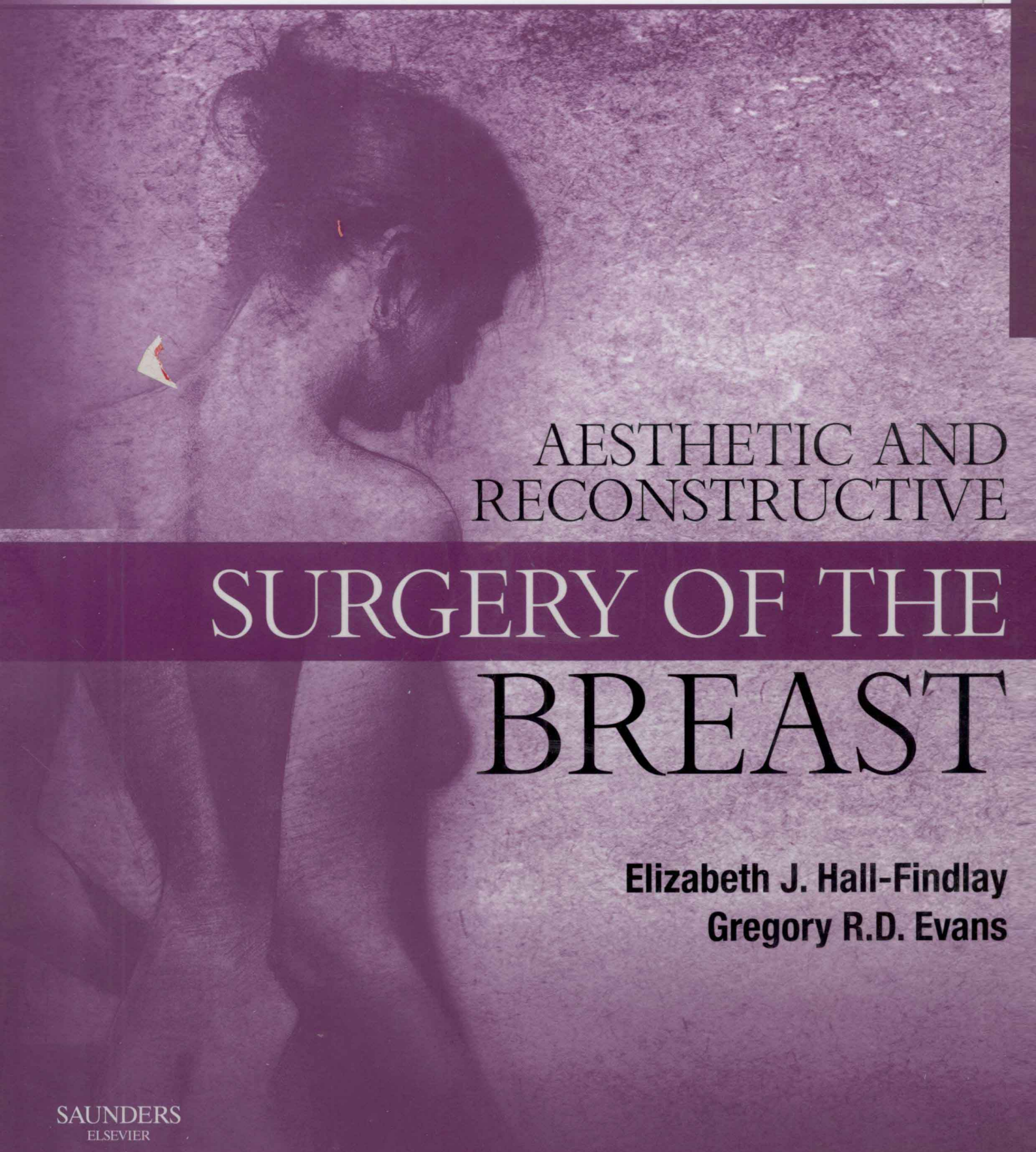

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Elizabeth J. Hall-Findlay
Gregory R.D. Evans

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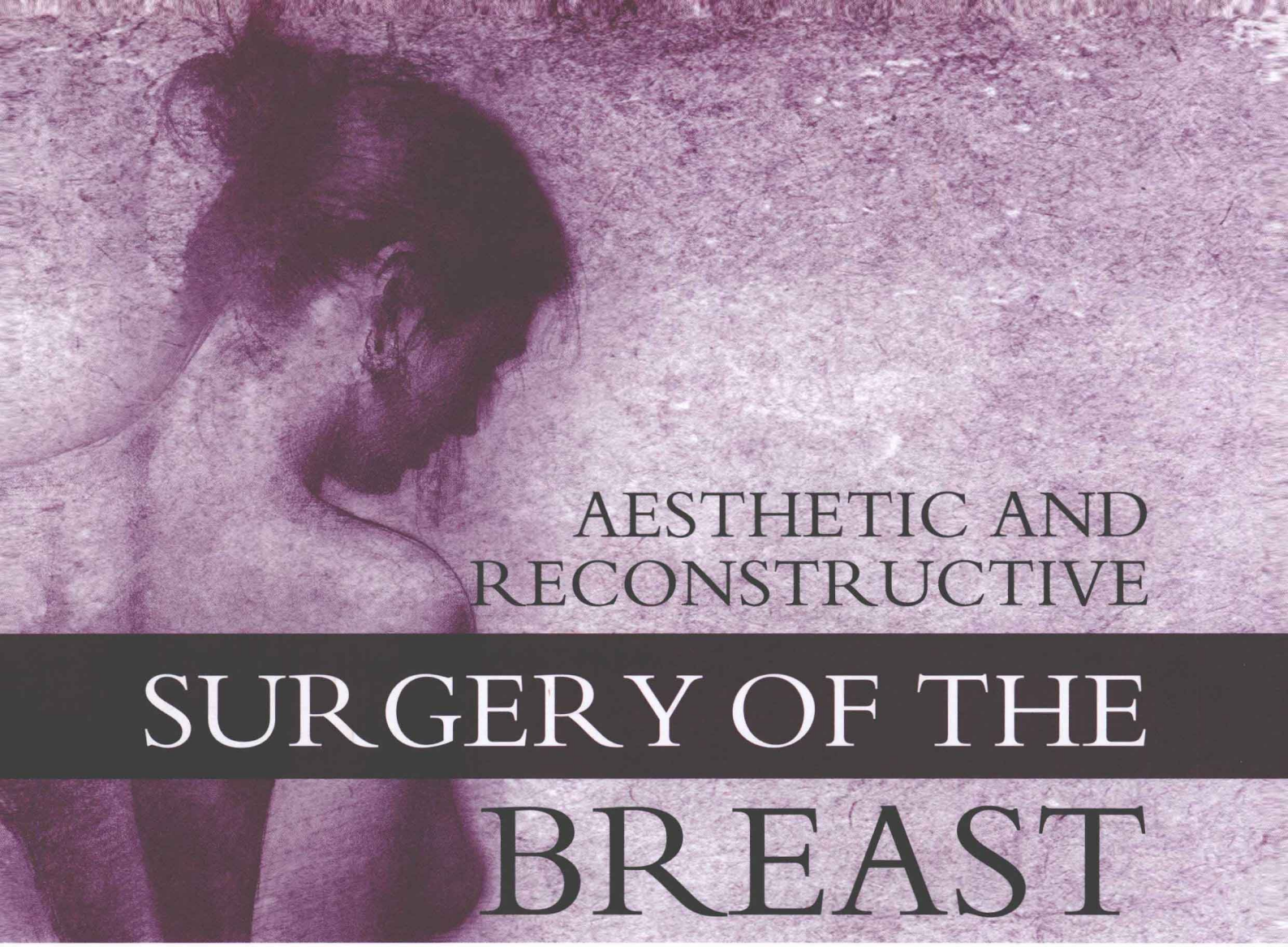

AESTHETIC AND RECONSTRUCTIVE SURGERY OF THE BREAST

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Preface

When we were asked to create a breast book for Elsevier, we were both concerned that this text had to have a different approach to similar books recently released. We hope that we have done this.

Our purpose is to focus on breast surgery – all aspects – from aesthetic to reconstructive. Instead of giving the reader variations on other texts, this book has authors whose work is respected around the world. These authors have important ideas to impart which will be very useful to plastic surgeons.

The book is outlined in several different sections and each chapter is designed to follow a pattern which makes finding relevant information easy. We have tried to include more controversial and future directions such as fat grafting and alternatives to traditional breast reduction techniques.

It is our hope that this comprehensive breast book will give the reader some broader insights into breast surgery along with a better understanding of appropriate concepts and principles. Techniques are clearly outlined in both the text and the illustrations to allow the reader to use this as a reference to improve and alter their own assessment and surgical approach to the breast.

E.J.H-F
G.R.D.E
2010

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Dedication

Dedication from Elizabeth Hall-Findlay

To my three children, Jamie, David and Elise, who have become truly enjoyable young adults.

Dedication from Gregory Evans

To Ruth, Brandon and Brogan – Thank you for your continued love, support and patience.
You make it all worthwhile.

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To my partners for their tireless contributions and to my mentors for their wisdom and teaching.

GE

I would like to thank my staff for all their support. I have appreciated all those who have challenged me both in my thinking and my performance.

EH-F

Contents

CHAPTER

1 History and Anatomy

History

Gregory R.D. Evans and Elizabeth J. Hall-Findlay

Breast Reconstruction

Breast cancer diagnosis and management have always been an issue in society. If Cleopatra had developed breast cancer, it would have been treated with cauterization in the hope of burning out the disease.

Even when breast cancer could be diagnosed, treatment was prevented by a lack of adequate anesthesia. William Halsted would not have been able to develop his radical mastectomy procedure without the advent of anesthesia. Unfortunately, breast cancer recurrence presented in spite of this disfiguring and invasive operation.

In the 1970s most breast surgeons began to favor the modified radical mastectomy when they realized that removing the pectoralis muscle did not improve the outcome. This became the gold standard for breast cancer treatment and any suggestions of an even more 'modified' approach were met with derision.

Finally, surgeons began to accept that segmental resections and lumpectomies combined with chemotherapy and radiation offered realistic alternatives.

Patient requests were rarely considered in the past, but surgeons can now offer patients several different options that suit their disease, their genetic and family predisposition status, their own self body image, and their personal lifestyles.

Initially, diagnosis and treatment were aggressively combined so that patients had their biopsies booked as possible mastectomies and lymph node dissections. Today, core sampling can establish the diagnosis and imaging and sentinel node biopsy can further clarify the extent of the disease.

Chemotherapy can be given before and/or after definitive treatment and radiation and, if used, can be given before or after the reconstruction. Surgery, chemotherapy, and radiation decisions are not separate issues but can be combined to suit the disease and patient desires.

Reconstruction following breast cancer was slow to develop. In fact today, even though our options for reconstruction are multiple and women have significant choices, only about one-third of the women seeking surgical options for their breast cancer seek reconstruction. Probably the most common method of reconstruction today occurs with the placement of a silicone or saline implant. Reconstruction options today are numerous and there is no correct answer. This is so different from the days when anyone who questioned radical mastectomy was treated as a pariah. Reconstruction was not even discussed back then as a future possibility.

The evolution of the use of autogenous tissue led to more options for women seeking reconstruction. Further, some women concerned about the use of implants turned to autogenous reconstruction as a viable alternative. Numerous techniques have evolved to allow for reconstruction using natural tissues. The earliest utilized

muscles to provide blood flow to the skin and create a breast mound. The latissimus dorsi flap was the most popular form of autogenous tissue reconstruction in the 1970s. Although there are currently still limitations to this form of reconstruction, this option is still utilized today for patients seeking improved reconstructive outcomes.[1-5]

In 1982 the first transverse rectus abdominis flap (TRAM) flap procedure was performed. This transfer of the lower abdominal muscle, fat, and tissue improved the shape of the breast and allowed a more acceptable donor site for autogenous breast reconstruction. The flap has remained a workhorse for reconstruction but is still complicated by issues related to blood supply and donor site morbidity. As microsurgical techniques evolved, our ability to improve the vascular supply of the TRAM flap also increased. As our microsurgical skills improved, further refinements of flap harvest were performed. The goal was to continue to decrease the potential for donor site morbidity. Initial attempts included techniques of muscle sparing. This allowed the harvest of part of the rectus muscle while sparing other components, leaving the rectus muscle intact in certain locations. Perforator flaps were introduced in the late 1990s and early 2000s as a mechanism to decrease the abdominal donor site morbidity. The deep inferior epigastric perforator flap and the superficial inferior epigastric flap allowed transfer of these autogenous tissues while sparing the harvest of the rectus abdominis muscle. With improved microsurgical skills, additional locations for reconstruction were examined. The gluteal artery perforator flap allows the use of skin from the buttocks. The gracilis myocutaneous flap allows the use of skin and a portion of muscle from the inner thighs. The latissimus dorsi was again utilized without harvesting of muscle to supply bulk in the creation of a breast mound.[1-5]

Issues today still concern primarily control of the disease. Treatment now needs to be integrated with various reconstructive decisions, coverage and types of implants when used, as well as treatment of the skin envelope (excision, skin sparing, mastectomy, and even nipple-sparing mastectomy).

Plastic surgeons were seeking new options because some of the initial procedures were disappointing. Now plastic surgeons have a vast array of options available, but there is still resistance from the general surgeons and oncologists. Not enough patients are being given the opportunity to participate in decision making and they are not being presented with all the treatment and reconstructive options available.

Breast Reduction

It has long been recognized that overly large breasts can be a significant burden for women. Treatment was delayed until the advent of anesthesia.

Initially, amputation techniques were used because they were relatively simple and straightforward. Surgeons began to understand that resection of parenchyma and skin should be designed to preserve nipple and areolar circulation. Numerous techniques were described over the years to reduce bulk, preserve the nipple and achieve an aesthetically desirable effect. Preservation of sensation and breast feeding potential were secondary.

No perfect design was achieved, but plastic surgeons persisted in trying to improve the cosmetic results while maintaining some of the successes achieved in the past with combining resection with preservation of nipple viability. Surgeons attempted to reduce scars while achieving a good shape and today the controversy persists as to which procedure or technique is superior.

As with many other decisions in plastic surgery, the answer comes down to surgeon experience and comfort along with individual patient indications and desires.

Mastopexy

The history of mastopexy surgery follows that of breast reduction. Plastic surgeons need to be able to combine lifting of the breast parenchyma with a reduction of the skin envelope while still preserving nipple and areolar viability.

There has long been controversy over the use of skin and dermis as a brassiere versus suture techniques in the parenchyma to hold up the breast. This issue has not been resolved.

Breast Augmentation

Patients have long desired an augmentation in breast size because of inadequate development, asymmetry, or loss of volume after pregnancy.

Breast implants were first introduced in the 1960s and numerous shells and fillers have been tried over the

years. Some have been more successful than others in providing a good shape, acceptable consistency and long lasting results. The FDA in the United States placed a moratorium on silicone gel filled breast implants in the 1990s, and for over 10 years Americans were restricted to using saline-filled implants. The ban was lifted when studies were finally accepted showing that silicone did not cause disease.

Surgical techniques for breast augmentation are as varied as those for reconstruction and reduction. No one technique has proven to be superior. Incision location and implant placement continue to be debated. Implants can be placed above the muscles or in numerous variations under the muscle. Even subfascial placement has its advocates.

It became accepted over the years that direct injection of even medical grade silicone was contraindicated because of migration and interference with both clinical diagnoses and imaging techniques. Injection of various non-medical substances by non-physicians (such as paraffin and various oils) was a disaster. These days, however, fat injections are not only becoming acceptable, but proper techniques are proving them to be clinically viable. The initial prohibition against fat injection because of the possibility of interfering with diagnosis is being recognized as a non-issue. Mammographers are now consistently saying that any sequelae of fat injections are not difficult to distinguish from more ominous finding suggestive of malignancy.

Mastopexy–Augmentation

All of the controversies surrounding mastopexy procedures and breast augmentation techniques are magnified when both are combined. Potential complications are increased and the surgery is less straightforward.

Lifting the breast tissue and adding an implant are processes that work against each other, especially over time. The same controversies about skin brassieres and suture techniques are continuing.

The history of breast surgery is not simple. New techniques are sometimes embraced too quickly (soybean oil filled implants) and some standard techniques are only slowly being adopted (the general surgery resistance to reconstruction). We can look at history to give us perspective and to help us continue to search for solutions to unsolved problems.

Anatomy

The adult female breasts lie on each side of the anterior thorax with their bases extending from about the second to sixth ribs.[1–8] The breasts lie on a substantial layer of fascia overlying the pectoralis major muscle superomedially, the serratus anterior muscle in the lower third, and the anterior rectus sheath in the lower medial area. Although these appear to be the boundaries of the breast, the duct system often extends more widely than this. In about 15% of the cases, breast tissue extends below the costal margins. It is critical when performing breast reconstruction that the inframammary fold is maintained or at least identified and reconstructed if surgical removal of additional breast tissue below this fold is required. Considerable asymmetry is frequently found among normal women and the patient may not be aware of this asymmetry or may accept this as a normal variant. This is important to point out to the patient as autogenous reconstruction with preservation of the skin envelope may lead to further asymmetry postoperatively. One-half of the women have a volume difference of 10% or more and one-quarter have a volume difference of 20% or greater (Fig. 1.1).[1]

The precise position of the nipple–areola complex varies widely with the fat content of the breast and the age of the patient. In the nulliparous breast, the nipple position lies approximately 19–21 cm from the sternal notch.[2] The amount of fat within the breast varies widely, as one would expect. The intimacy with which it is mixed with glandular tissue also varies. Microscopic examination demonstrates that the nipple is composed of the terminal ducts with a supporting stroma of smooth muscle that are mainly arranged in a circular fashion with a few arranged radially. Contraction of the circular muscles causes nipple projection; contraction of the radial fibers causes retraction.

Breast tissue consists of lobes separated from each other by fascial envelopes, usually 15–20 in number. Each lobe is drained by a ductal system from which a lactiferous sinus opens on the nipple and each lactiferous sinus receives up to 40 lobules. Each lobule contains 10–100 alveoli which comprise the basic secretory unit (Fig. 1.2).

The blood supply is from the axillary artery via its thoracoacromial, lateral thoracic and subscapular arteries, and from the subclavian artery via the internal thoracic artery. The internal thoracic artery supplies the three