# RESEARCH COLLECTION ON BREAST RECONSTRUCTION

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#### Research Collection on Breast Reconstruction

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Research Collection on Breast Reconstruction

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#### **Preface**

Techniques and practices in breast reconstruction have developed considerably in recent decades, and this book aims to provide a comprehensive source of current knowledge, techniques and approaches for the major modalities of the procedure. Its contributors draw on many years of experience in different settings worldwide to provide an authoritative resource. In the first part, both current perspectives and state of the art techniques are covered. General topics include an overview of oncoplastic surgery and a discussion of how to select an appropriate method for breast restoration. New techniques such as deep inferior epigastric artery perforator flap, profunda artery perforator flap and fat grafting are presented by practicing surgeons. In the second part, current techniques are evaluated. Topics examined include reconstruction with acellular dermal matrix and septocutaneous gluteal artery perforator (Sc-GAP) flap. The book will be a valuable source of insights into surgical techniques, considerations and best practice that will benefit surgeons early in their careers; however, it will also be useful for researchers and surgeons interested in new and emerging techniques.

### BREAST RECONSTRUCTION -CURRENT PERSPECTIVES AND STATE OF THE ART TECHNIQUES

Edited by Aldona J. Spiegel

#### **Oncoplastic Surgery**

Rachel Wellner

Additional information is available at the end of the chapter

http://dx.doi.org/10.5772/56639

#### 1. Introduction

The evolution of breast cancer management, following an arc of scientific discovery, is steeped in rich tradition and sacrament. A basic historical understanding of key discoveries in oncology sets the framework for our modern standards in cancer management, including our various applications in the field of breast oncology, breast reconstruction, and the "marriage" of the two, aptly named "oncoplastic surgery".

Cancer was first described by Hippocrates, the ancient Greek physician considered the father of medicine, who observed that malignant tumors resembled crabs (Gr. karkinos), with its mass-like center and appendages arching outward. [1] Cancer is an age-old disease that has continued to elude mankind for centuries. The process of uncontrolled cell division, cancer refers to a process by which the hosts own cells divide rapidly in a seemingly chaotic, hap-hazard way, but, in actuality, is the result of complex genetic and environmental factors that "program" a person's own normal cells to acquire a malignant quality, ultimately leading to the infiltration of normal organs by these masses of abnormal cells. [1]

Breast cancer is the world's leading cancer in women second to all skin malignancies. [2] Behind lung cancer, breast cancer is the second leading cause of cancer mortality in women. [2] It affects approximately one in eight women over a lifetime, translating into roughly over 230, 000 new cases of invasive breast cancer and over 50, 000 cases of non-invasive breast cancer per year in the country alone. About 40, 000 people die of breast cancer annually in the U. S. It continues to be a major cause of mortality world-wide, particularly in developing countries, where access to prevention, screening, and even appropriate management might be scarce. [2]

Breast cancer incidence increased in the 1980s and 1990s, a trend that was multifactorial, largely attributable to the increase in screening mammography, but also associated with reproductive risk factors and environmental risks such as the widespread use of hormone replacement therapy. The incidence has remained relatively stable in recent years, reflecting a decline in



the use of exogenous hormones in post-menopausal women and a stabilization in numbers of women undergoing screening. [2]

Breast cancer incidence is strongly related to age, peaking in the later decades. Other risk factors implicated in the development of breast cancer include genetics (strong family history of breast or other related malignancies), hormonal and reproductive risk factors such as early menarche, late menopause, late onset of first pregnancy, hormone replacement therapy, and environmental risk factors including obesity, excess alcohol, high-dose radiation, and possibly nutritional factors. People at high risk for breast cancer include those previously diagnosed with breast cancer, those with atypical cells on a breast biopsy, and patients with mammographically dense breasts. [2]

Paralleling our improved understanding of breast carcinogenesis, risk factors, and improved surveillance are a multitude of advances in treatments.

The first loosely documented case of treated breast cancer was in 550 B. C. in the Persian Queen Atossa, who commissioned her slave Democedes to perform a primitive lumpectomy, essentially coring out her tumor, and allowing closure via secondary intention. [1] Treatments in centuries to follow ranged from drainage of "black bile," salves, prayer, various home remedies, breast amputation, and treatment of depression. In the early 19th Century, William Halsted first described his radical mastectomy. The Halsted radical mastectomy involved removal of the entire breast gland, axillary lymph nodes, and chest wall muscles. Along with myriad other advances, with the advent of Joseph Lister's antiseptic techniques and general anesthetic developments discovered at the turn of the century, a surgical endeavor that would have been considered almost universally fatal was now conceivable. [1]

#### 1.1. Images

At the time, the Halsted mastectomy was believed to offer a true cure for the breast cancer patient, given that she survived surgery. The theory of breast cancer representing a systemic disease had been washed away with Galen's black bile. A local disease required radical local treatment, regardless of physical deformity and lack of functionality. As such, the results were uniformly disfiguring but accepted as the singular option for survival. During this period, cancer was believed to be a local disease that spread in a predictable, time dependent fashion, therefore enlisting a massive operation to remove all cancer cells in order to render a patient cured. This procedure represented the standard of care for the next century, despite many patients presenting with small cancers not requiring such a radical approach.

Despite the improved short-term survival in patients undergoing maximal debulkment, long term results of this approach did not fare as well. By the mid 20<sup>th</sup> Century, the National Surgical Adjuvant Breast and Bowel Project (NSABP) had been conceived. [5] In 1971, Drs. Bernard and Edwin Fisher conducted animal studies that demonstrated metastases of tumor cells to both the lymphatics and the circulation, thereby laying question to Halsted's model of breast cancer as a "local" disease. In a trial of 1600 women undergoing Halsted radical mastectomy versus the less invasive total mastectomy, which spared lymph nodes and chest wall muscles, outcomes were comparable for the two groups, leading to the abandonment of the Halstead