

Juarez M. Avelar  
*Editor*

# Breast Surgery

Aesthetic Approaches

 Springer

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Juarez M. Avelar  
São Paulo, SP  
Brazil

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## Tribute to Prof. Ivo Pitanguy



I dedicate this book to Prof. Ivo Pitanguy for his superb work over the course of 56 years devoted to the improvement of plastic surgery. Besides being an outstanding and talented surgeon, he promoted the specialization of more than 500 new plastic surgeons from all over the world, at a high level of qualification. His remarkable scientific contributions undoubtedly provide important support in every field of plastic surgery. In particular, Prof. Pitanguy developed a new technique for mastoplasty without cutaneous undermining,

through kill resection of the mammary gland without dead space, with a minimal rate of complications during and after surgery. Because of several advantages, his technique is well known by plastic surgeons all over the world. Following the surgical principles of Prof. Pitanguy's technique, several plastic surgeons have developed new approaches that represent important advances in mastoplasty. For all these reasons, I am immensely thankful to Prof. Pitanguy, recognizing his important presence in my life. I dedicate this book to him, with the participation of 39 Brazilian plastic surgeons.

It was an honor and privilege for me to have been trained by Prof. Pitanguy, who opened a wide horizon in my life, giving me wonderful opportunities and the possibility of realizing my dream of being a doctor. As well as helping in my professional activity, Prof. Pitanguy also encouraged in my soul a fantastic motivation and inspired me in the scientific field, making me constantly search for more knowledge through dedicated research.

Juarez M. Avelar, M.D.

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## Foreword I

Dr. Juarez Avelar, during his specialization in our post-graduate course, showed a great curiosity for difficult problems, whether in ear deformities or other cases.

The hypertrophic breast is frequently encountered in our practice, causing an unpleasant series of functional problems that demand from the plastic surgeon an approach that can achieve satisfactory results with a minimum rate of complications. Juarez realized the benefits of the new techniques that we were developing and examines these and others in this book. However, he leans toward the technique, without undermining others, involving determination of the point “A” as a basic marking element, and other details that he shows clearly in this book.

In this book, Juarez also studies the progress of breast surgery, giving credit to the many authors who cooperated in developing different approaches, allowing accurate procedures for a variety of breast deformities. This book definitely deserves assessment by plastic surgeons engaged in body contour approaches, in particular for mastoplasty procedures. Its coverage is especially valuable for obtaining good results without many complications. I congratulate Dr. Juarez for outstanding editorial work in producing this important book.

Ivo Pitanguy, M.D.  
Pontifical Catholic University of Rio de Janeiro  
Rio de Janeiro, RJ, Brazil  
Carlos Chagas Institute of Post-Graduate Medical Studies  
Rio de Janeiro, RJ, Brazil  
Brazilian Society of Plastic Surgery  
São Paulo, SP, Brazil  
American Society of Aesthetic Plastic Surgery  
New York, NY, USA  
International Society of Aesthetic Plastic Surgery  
Hanover, NH, USA

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## Foreword II

“This is the spirit that Beauty must ever induce: wonderment and a delicious trouble, longing and love and a trembling that is all delight” (Plotinus 23, [Ennead 1, 3]).

It is with great pleasure that I have been asked to write the foreword for Dr. Juarez Avelar’s book on breast surgery. Dr. Avelar is a highly respected Brazilian plastic surgeon who pioneered (in the 1990s) the procedure of lipoabdominoplasty, which preserves the blood vessels of the upper abdominal wall flap during abdominoplasty. He is proliferative in authoring books on plastic surgery, such as *Creation of the Auricle* and *New Concepts on Abdominoplasty and Further Applications*, as well as journal articles and book chapters.

Dr. Avelar’s new book entitled *Breast Surgery: Aesthetic Approaches* is innovative in subjects such as general information for breast surgery, surgical options for reduction breast surgery, aesthetic reparation of breast and chest wall deformities, mastopexy, and breast augmentation. Chapters include “Importance of Pitanguy’s Technique for Evolution of Aesthetic Breast Surgery,” “Reduction Mammoplasty in a Single Central Block,” “Technical Systemization in Mammoplasty,” “New Mastoplasty with Superior and Inferior Pedicles,” “Mammoplasty Through Periareolar Approach,” “Critical Analysis Concerning Mammary Prosthesis,” and “Importance of Regenerative Medicine on Breast Augmentation.” The contributors are expert Brazilian plastic surgeons with new knowledge and techniques.

This book is intended for plastic surgeons, cosmetic surgeons, general surgeons, and any surgeon performing aesthetic breast surgery. Young surgeons, experienced surgeons, and advanced breast surgeons can learn a variety of techniques and approaches to breast surgeries from the 60 chapters.

Tustin, CA, USA

Melvin A. Shiffman, M.D., J.D.

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## Preface

Publishing this book is an accomplishment of my professional desire to present the new techniques described by Brazilian plastic surgeons following the fundamental surgical principles and knowledge introduced by Prof. Pitanguy. In fact, a new era began in this field when Prof. Pitanguy described his novel concepts in reduction mastoplasty.

In 1980, when Prof. Jorge Psillakis and I organized the Brazilian Symposium on Breast Surgery in São Paulo, I wondered about printing a collection of contributions in this fascinating area, including several important new procedures created and developed by outstanding plastic surgeons. Some years later, I tried again to complete this work, but for unexpected reasons it was not possible. Therefore, this book represents the achievement of my dream of 37 years. It gives me special pleasure to offer readers a very wide collection of the new techniques presented at that scientific event, which represent the updated improvements in aesthetic breast surgery. I was still a young surgeon, but my mind was full of imagination and the determination to make a definitive register of new approaches to aesthetic procedures in breast surgery. Unfortunately, several of my colleagues who took part in the scientific program of that symposium are no longer with us, but I investigated their remarkable contributions and invited other plastic surgeons to write about their techniques. Besides Prof. Ivo Pitanguy, who passed away in August 2016, other authors of useful techniques left their contributions: Arié, Aleixo Sepulveda, Costa Lima, Peixoto, and Pigossi. Therefore, this publication describes modern methods that can improve plastic surgeons' aesthetic results after breast operations.

Basically, there are three main groups of techniques: (a) those that find a balance between the dimension of final scars and the shape and size of the breast after mastoplasty; (b) creation of glandular flaps that are sutured to model the breast during operation; and (c) a combination of both previous groups, which requires knowledge, good sense, and the ability to reshape the breasts in harmony with body contouring and with adequate symmetry between them.

Regarding the first group of techniques, the surgeon should not damage the final shape of the breasts in the quest for reduced and small surgical scars. I advocate that the size and form of the breasts are the main aspects for consideration after aesthetic mastoplasty. Usually, such criteria are similar to the patient's analysis. Reduced scars during operation must be a constant goal for every surgeon, as they do not jeopardize the final shape of the breasts.



Considering the second group of techniques, in which glandular flaps are created, it is a fundamental surgical principle to preserve adequate blood supply in order to avoid any risk of slough or even necrosis of mammary tissue. Readers should observe the technical descriptions given by the authors, particularly concerning complications after operations, each of which are mentioned.

The third group of methods, which is a combination of creation of mammary flaps and reduced surgical scars, require the surgeon to have good sense in order to avoid minor (or major) complications during and after surgery. Such aspects are achieved according to the knowledge, ability, and experience of the surgeon after performing a considerable number of breast operations.

Nevertheless, plastic surgeons should search continuously for new solutions to improve their results, always using their talent and stimulating their creativity to solve each problem as it comes up during an operation.

In conclusion, the main reason for publishing this book is to offer a unique opportunity to read meticulous descriptions of the personal techniques of 39 outstanding Brazilian plastic surgeons. It is important to emphasize that I invited several other well-known surgeons, but they did not join us in preparing this book. I take this opportunity to express my gratitude to all authors that accepted my invitation to participate with their contributions and to share their knowledge. Plastic surgeons and breast surgeons from all over the world may learn the techniques developed by very well qualified Brazilian specialists. I am sure that this book will introduce updated scientific methodology to the international medical literature.

São Paulo, SP, Brazil

Juarez M. Avelar

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## Acknowledgments

While I was organizing the Brazilian Symposium on Breast Surgery in 1980, it was my dream to publish a book in which several Brazilian authors described their own techniques for mastoplasty. For various reasons, it was not possible to do this. Now, 37 years later, I have realized my project. Although, unfortunately, some of my colleagues who took part in that scientific program have passed away, it gives me great pleasure to include their contributions. Therefore, I am thankful to Profs. Ivo Pitanguy, Aleixo Sepulveda, Costa Lima, Gerardo Peixoto, and Nelson Pigossi. I also thank very much the 39 authors who have described their useful approaches.

To my parents, Anisio and Maria Ana. Although they are not with me in this world, I continuously feel their presence and I am thankful for their continuous enthusiasm and incentive.

To my loving son Thiago, and my wife Gloria, who have been constant sources of inspiration for this publication and permanent witnesses to my scientific activities.

To Professor Pitanguy, for all the knowledge I have acquired from him and for his constant encouragement of my work. He helped me throughout my professional practice by developing in me great motivation and an enthusiasm for the field of science.

To Dr. Edgar Bolanho, for the very high level of technical illustrations in this book, for the chapters I wrote as well as of other authors.

To the Plastic Surgery Unit at the Surgery Department of Science and Technology at Medical School of Marília, and the Hospital das Clínicas of Marília (both in São Paulo State). Professor Helio de Rezende Paoliello Jr. is the head of the Plastic Surgery Unit, who presented me with excellent conditions and support for organizing and publishing this book.

To the Federal University of Rio de Janeiro—UNIRIO and to Prof. Ricardo Cavalcanti Ribeiro, the head of the Plastic Surgery Department for their great assistance and incentive to elaborate and publish this book.

Juarez M. Avelar, M.D.

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## List of Contributors

**Jose Horacio Aboudib, M.D., Ph.D.** Plastic Surgery Pedro Ernesto University Hospital, Rio de Janeiro State University Estrada da Gávea, RJ, Brazil

**Antonio Carlos Abramo, M.D., Ph.D.** Division of Plastic Surgery at General Hospital São Luiz Morumbi, Post Graduate Course in Aesthetic and Reconstructive Plastic Surgery of ACA, Institute of Assistance in Plastic Surgery of São Paulo, Rua Afonso de Freitas, SP, Brazil

**Christiane Vigné Alvarez de Abreu, M.D.** Hospital of Plastics, Rio de Janeiro, RJ, Brazil

**Yolotzin Mendez Aguilar, M.D.** Global Plastic Surgery Department, Casa de Saúde Portugal, Universidade Santa Úrsula, Rio de Janeiro, RJ, Brazil

**Ataliba Ronan Horta de Almeida, M.D.** Sociedade Brasileira de Cirurgia Plástica, São Paulo, SP, Brazil

Plastic Surgery Training Center, Hospital Mater Dei, Belo Horizonte, MG, Brazil

**Rafael Andrade Alves, M.D.** Brazilian Society of Plastic Surgery, Hospital São Rafael, Salvador, BA, Brazil

**Carlo Amaral, M.D.** Member of the Plastic and Reconstructive Surgery Department, Ivo Pitanguy, Rio de Janeiro, RJ, Brazil

Plastic Surgery Department, Ivo Pitanguy, Rio de Janeiro, RJ, Brazil

Federal University of the State of Rio de Janeiro (UNIRIO), Rio de Janeiro, RJ, Brazil

Member of Brazilian Plastic Surgeons Society, Hospital Casa de Portugal, Rio de Janeiro, RJ, Brazil

**Antonio Carlos Herrmann de Andrade, M.D.** Rua Joaquim Floriano, São Paulo, SP, Brazil

**Joel Araújo Silva, M.D.** Hospital Belo Horizonte, Belo Horizonte, MG, Brazil



**Juarez M. Avelar, M.D.** Brazilian Scientific Institute of Plastic and Reconstructive Surgery, Alameda Gabriel Monteiro da Silva, São Paulo, SP, Brazil

Latus Sensus in Plastic Surgery, Federal University of the State of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Member of the Brazilian Society of Writers Doctors (SOBRAMES), São Paulo, SP, Brazil

Plastic Surgery Unit, Marília Medical School, Marília, SP, Brazil

Brazilian Society of Plastic Surgery (1986–87) and (1990–91), São Paulo, SP, Brazil

The International Society of Aesthetic Plastic Surgery (ISAPS), São Paulo, SP, Brazil

**Priscilla Balbinot, M.D., M.Sc.** Federal University of Paraná, Rua General Carneiro, 188—Hospital de Clínicas, Curitiba, PR, Brazil

**Guilherme Cardinal Barreiro, M.D., Ph.D.** Brazilian Society of Plastic Surgery, University of Campinas (UNICAMP), São Paulo, SP, Brazil

**Roberto D. Basile, M.D.** The American Society of Plastic Surgery, Arlington Heights, IL, USA

The Brazilian Society of Plastic Surgery, São Paulo, SP, Brazil

Department of Plastic Surgery, Basile Day Hospital, Ribeirão Preto, SP, Brazil

**Adrian Bermudez, M.D.** Condomínio Península, Avenida Das Acácias, Rio de Janeiro, RJ, Brazil

**Antonio Roberto Bozola, M.D.** Regent Cirurgia Plástica da Faculdade de Medicina de São José do Rio Preto, São José do Rio Preto, SP, Brazil

**Ryane Schmidt Brock, M.D., M.Sc.** Department of Plastic Surgery, The Brazilian Society of Plastic Surgery, Defeitos da Face Studies and Research Center, São Paulo, SP, Brazil

**Alberto M.L. Caldeira, M.D., M.Sc., Ph.D., FACS, FICS** Global Plastic Surgery Department, Casa de Saúde Portugal, Instituto de Pós-Graduação Médica Carlos Chagas, Universidade Santa Úrsula, Rio de Janeiro, RJ, Brazil

Plastic and Reconstructive Surgery Department, Caldeira-Roth Institute, Ipanema, RJ, Brazil

**Humberto Campos, M.D.** Bahia School of Medicine and Public Health, Salvador, BA, Brazil

Brazilian Society of Plastic Surgery, São Paulo, SP, Brazil

**Sérgio Carreirão, M.D.** Brazilian Society of Plastic Surgery (TSBCP), São Paulo, SP, Brazil

Brazilian College of Surgeons (ECBC), Rio de Janeiro, RJ, Brazil

American College of Surgeons (FACS), Chicago, IL, USA

**Claudio Cardoso de Castro, M.D.** Department of Plastic Surgery, University of the State of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

**Barbara de Castro Fonseca, M.D.** Hospital of Plastics, Rio de Janeiro, RJ, Brazil

**Armando Chiari Jr., M.D., Ph.D.** Department of Surgery, Medical School, Federal University of Minas Gerais, Rua Herculano de Freitas, Belo Horizonte, MG, Brazil

**Wanda Elizabeth Correa, M.D.** Department of Ivo Pitanguy Plastic Surgery, Pontifical Catholic University, Rio de Janeiro, RJ, Brazil

**Márcio Paulino Costa, M.D., Ph.D.** Brazilian Society of Plastic Surgery, ISAPS, FILACAP, ASPS, Hospital das Clínicas, University of São Paulo Medical School, Santa Cecília, SP, Brazil

**Pedro Felipe Suárez Cruz, M.D.** Division of Plastic and Reconstructive Surgery, Carlos Chagas Institute, Rio de Janeiro, RJ, Brazil

**Miluska Bromley Cueva, M.D.** Instituto Ivo Pitanguy, Rio de Janeiro, RJ, Brazil

Instituto de Pós-Graduação Médica Carlos Chagas, Rio de Janeiro, RJ, Brazil

**João Erfon, M.D.** Department of Surgery, Walter Cantídio Hospital of the Federal University of Ceará, Fortaleza, CE, Brazil

**Marco Aurélio Faria Correa, M.D.** Dr. Marco Faria Correa Plastic Surgery Pte Ltd, Singapore, Singapore

**Angela Maria Fausto Souza, Ph.D.** Gynecology Department, Oswaldo Cruz Foundation, Rio de Janeiro, RJ, Brazil

**Miriam Fialka, M.D.** Plastic Surgery, Clínica Miranda, Curitiba, PR, Brazil

**Isabel Vieira de Figueiredo-e-Silva, M.D.** Brazilian Society of Plastic Surgery, Carlos Chagas Institute, The American Society of Plastic Surgeons, Rio de Janeiro, RJ, Brazil

**Luis Bernardo Froes, M.D.** Faculty of Medicine, University of São Paulo, Butantã, SP, Brazil

**Giovani Araujo Godinho Filho, M.D.** Serviço de Cirurgia Plástica da Santa Casa de Misericórdia de Goiânia, MEC/SBCP, Goiânia, GO, Brazil

**Santos Espinal Gómez, M.D.** Global Plastic Surgery Department, Casa de Saúde Portugal, Instituto de Pós-Graduação Médica Carlos Chagas, Universidade Santa Úrsula, Rio de Janeiro, RJ, Brazil

**Ruth Graf, M.D., Ph.D.** Pietà Centro Médico, Hospital de Clínicas—Rua General Carneiro, Curitiba, PR, Brazil

**Farid Hakme, M.D.** Hospital of Plastics, Rio de Janeiro, RJ, Brazil

**Leandro Ramalho Chaves Isobe, M.D.** SBCP, Plastic Surgery Medical Team, Hospital Mater Dei, Belo Horizonte, MG, Brazil

**Bruna Jacobowski, M.D.** Hospital of Plastics, Rio de Janeiro, RJ, Brazil

**Carlos Alberto Jaimovich, M.D.** Ivo Pitanguy Institute of Plastic Surgery/PUC-RJ Post-graduation University, Rio de Janeiro, RJ, Brazil

**Emília Silva Klein, M.D.** Hospital Belo Horizonte, Belo Horizonte, MG, Brazil

**Andrea Kocsis, M.D.** Member of the Plastic and Reconstructive Surgery Department, Federal University of the State of Rio de Janeiro (UNIRIO), Rio de Janeiro, RJ, Brazil

Casa de Portugal, Rio de Janeiro, RJ, Brazil

**Célio Ferreira Leão, M.D.** Faculdade de Medicina da Universidade Federal de Goiás, Goiânia, GO, Brazil

Escola de Medicina da Pontifícia Universidade Católica de Goiás, Goiânia, GO, Brazil

Serviço de Cirurgia Plástica da Santa Casa de Misericórdia de Goiânia, MEC/SBCP, Goiânia, GO, Brazil

Sociedade Brasileira de Cirurgia Plástica, São Paulo, SP, Brazil

**Gheisa Moura Leão, M.D.** Escola de Medicina da Pontifícia Universidade Católica de Goiás, Goiânia, GO, Brazil

Serviço de Cirurgia Plástica da Santa Casa de Misericórdia de Goiânia, MEC/SBCP, Goiânia, GO, Brazil

Sociedade Brasileira de Cirurgia Plástica, São Paulo, SP, Brazil

Clínica de Cirurgia Plástica—Allure, Goiânia, GO, Brazil

**Célio Coelho Neto Leão, M.D.** Hospital of Plastics, Rio de Janeiro, RJ, Brazil

**Luis Emilio Fuentes López, M.D.** Division of Plastic and Reconstructive Surgery, Carlos Chagas Institute, Rio de Janeiro, RJ, Brazil

**André Villani Correa Mafra, M.D.** Sociedade Brasileira de Cirurgia Plástica, São Paulo, SP, Brazil

Plastic Surgery Training Center, Hospital Mater Dei, Belo Horizonte, MG, Brazil

SBCP, Plastic Surgery Medical Team, Hospital Mater Dei, Belo Horizonte, MG, Brazil

**Walter Marrou Pautrat, M.D.** Instituto Ivo Pitanguy/Instituto de Pós-Graduação Médica Carlos Chagas, Rio de Janeiro, RJ, Brazil

**Lybio Martire Jr., M.D.** University Department of Plastic Surgery, Surgical Technique and History of Medicine, Titular of Brazilian Society of Plastic Surgery, Titular of Federation Ibero Latinoamericana de Cirurgia Plástica y Reconstructiva, Titular of Brazilian College of Surgeons, Fellow of International College of Surgeons, Titular Founder of Brazilian Society of History of Medicine, São Paulo, SP, Brazil

**Marcelo Paulo Vaccari Mazzetti, M.D., M.Sc.** Department of Plastic Surgery, The Brazilian Society of Plastic Surgery, Defeitos da Face Studies and Research Center, São Paulo, SP, Brazil

**Moacyr Pires de Mello Filho, M.D.** Cirurgica, De Mello Cirurgia Plástica, São Paulo, SP, Brazil

**Marcio Milman, M.D.** Gynecology Department, Oswaldo Cruz Foundation, Rio de Janeiro, RJ, Brazil

**José Carlos de Miranda, M.D.** Plastic Surgery, Clínica Miranda, Curitiba, PR, Brazil

**Arnaldo Miró, M.D.** Clínica de Cirurgia Plástica e Reparadora Dr. Arnaldo Lobo Miró Ltda, Curitiba, PR, Brazil

**Maria Gabriela Moreira Mangles, M.D.** Division of Plastic and Reconstructive Surgery of Centro Policlinico Valencia, Valencia, Venezuela

**Marcus Vinicius Alfano Moscozo, M.D.** Brazilian Society of Plastic Surgery, Hospital São Rafael, Salvador, BA, Brazil

Ibero-Latin American Society of Plastic Surgery, Punta del Este, Uruguay

**Roosevelt Santos Oliveira Jr., M.D.** Sociedade Brasileira de Cirurgia Plástica, Santos, SP, Brazil

**Daniele Pace, M.D., M.Sc.** Pietà Centro Médico, Rua Albino Silva, Curitiba, PR, Brazil

**Helio Paoliello Jr.** Plastic Surgery Discipline, Faculdade de Medicina de Marília (FAMEMA), Marília, SP, Brazil

**Ricardo Paoliello, M.D.** Plastic Surgery Discipline, Faculdade de Medicina de Marília (FAMEMA), Marília, SP, Brazil

**Marcelo Pastor, M.D.** Condomínio Península, Avenida Das Acácias, Rio de Janeiro, RJ, Brazil

**Vilibaldo Cabral de Paulo, M.D.** Avenida Coremas, João Pessoa, PB, Brazil

**Oswaldo Pereira, M.D.** Clínica Jane Hospital Ilha, Deputado Antonio Edu Vieira, Florianópolis, SC, Brazil

**Ivo Pitanguy, M.D.** Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Carlos Chagas Institute of Post-Graduate Medical Studies, Rio de Janeiro, RJ, Brazil

Brazilian Society of Plastic Surgery, São Paulo, SP, Brazil

American Society of Aesthetic Plastic Surgery, New York, NY, USA

International Society of Aesthetic Plastic Surgery, Hanover, NH, USA

**Paulo Roberto Botica do Rêgo Santos, M.D.** Gynecology Department, Oswaldo Cruz Foundation, Rio de Janeiro, RJ, Brazil

**Waldir Teixeira Renó, M.D.** Cirurgia Plástica D'America Clinica, Plastic-Surgeon Santa Casa de Guaratinguetá, Membro Titular da SBCP, Guaratinguetá, SP, Brazil

**Flávio Rezende, M.D.** Plastic and Reconstructive Surgery, Universidad Federal del Estado de Río de Janeiro, Brazilian Society of Plastic Surgery, Rio de Janeiro, RJ, Brazil

**Ricardo Cavalcanti Ribeiro, M.D., Ph.D.** Division of Plastic and Reconstructive Surgery of Casa de Portugal, Brazilian Society of Plastic Surgery, Carlos Chagas Institute, Rio de Janeiro, RJ, Brazil

Plastic and Reconstructive Surgery Department, Federal University of the State of Rio de Janeiro (UNIRIO), Rio de Janeiro, RJ, Brazil

**Manuel Torreira Rios, M.D.** Division of Plastic and Reconstructive Surgery, Carlos Chagas Institute, Rio de Janeiro, RJ, Brazil

**Ana Carolina Guimarães Rocha, M.D.** Brazilian Society of Plastic Surgery, São Paulo, SP, Brazil

**Claudio Mauricio M. Rodrigues, M.D.** Unichristus University, Fortaleza, CE, Brazil

**Sheyla Maria Carvalho Rodrigues, M.D.** Department of Plastic Surgery, University of the State of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

**Sergio Romay, M.D.** Division of Plastic and Reconstructive Surgery, Carlos Chagas Institute, Rio de Janeiro, RJ, Brazil

**Ilson Abrantes Rosique, M.D.** Sociedade Brasileira de Cirurgia Plástica, Santos, SP, Brazil

**Alessandra Grassi Salles, M.D.** Plastic Surgery, Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, SP, Brazil

**Renato Saltz, M.D., FACS** Member of the Plastic and Reconstructive Surgery Department, Federal University of the State of Rio de Janeiro (UNIRIO), Rio de Janeiro, RJ, Brazil

**Mariangela Santiago, M.D.** Brazilian Society of Plastic Surgery, São Paulo, SP, Brazil

International Society of Aesthetic Plastic Surgery, Hanover, NH, USA

**Rayssa Sauaia, M.D.** Department of Plastic Surgery

Defeitos da Face Studies and Research Center, São Paulo, SP, Brazil

- William Seidel, M.D.** VIVVA Clinica, Florianópolis, SC, Brazil
- Fernando Serra-Guimarães, M.D., Ph.D.** Plastic Surgery, Pedro Ernesto University Hospital, Rio de Janeiro State University, Rio de Janeiro, RJ, Brazil
- Melvin A. Shiffman, M.D., J.D.** Northwestern University, Tustin, CA, USA
- Sérgio Levy Silva, M.D.** Rua Real Grandeza, Botafogo, RJ, Brazil
- Ramil Sinder, M.D.** Member of the Brazilian Society of Plastic Surgery, Rio de Janeiro, RJ, Brazil
- Irene Coelho de Souza, M.D.** Cirurgia Plástica, Clínica Cirúrgica Drs. Irene e Carlos Souza, Belém, PA, Brazil
- Vera Tatiana Coelho de Souza, M.D.** Cirurgia Plástica, Clínica Cirúrgica Drs. Irene e Carlos Souza, Belém, PA, Brazil
- Mário Junqueira Souza, M.D.** Serviço de Cirurgia Plástica da Santa Casa de Misericórdia de Goiânia, MEC/SBCP, Goiânia, GO, Brazil
- Ewaldo Bolivar de Souza Pinto, M.D.** Sociedade Brasileira de Cirurgia Plástica, Santos, SP, Brazil
- Priscilla Chiarello de Souza Pinto Abdalla, M.D.** Sociedade Brasileira de Cirurgia Plástica, Santos, SP, Brazil
- Ana Paula Pimentel Spadari, M.D.** Sociedade Brasileira de Cirurgia Plástica, Santos, SP, Brazil
- Nuberto H. Teixeira, M.D.** Brazilian Society of Plastic Surgery, University of São Paulo Medical School, São Paulo, SP, Brazil
- Guilherme Teles, M.D.** Defeitos da Face Hospital and Santa Cruz Hospital, Fortaleza, CE, Brazil
- Rawson de Thuin, M.D.** Brazilian Society of Plastic Surgery, Carlos Chagas Institute, International Society of Aesthetic Plastic Surgery, Rio de Janeiro, RJ, Brazil
- Manuel Antonio Torreira Rios, M.D.** Global Plastic Surgery Department, Casa de Saúde Portugal, Instituto de Pós-Graduação Médica Carlos Chagas, Universidade Santa Úrsula, Rio de Janeiro, RJ, Brazil
- Johana Buitrago Valderrama, M.D.** Division of Plastic and Reconstructive Surgery of Casa de Portugal, Rio de Janeiro, RJ, Brazil
- Tiago Almeida Vale, M.D.** Serviço de Cirurgia Plástica da Santa Casa de Misericórdia de Goiânia, MEC/SBCP, Goiânia, GO, Brazil
- João Francisco Vale Pereira, M.D.** Clínica Vale Pereira, Florianópolis, SC, Brazil

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**Part I**

**General Information for Breast Surgery**

# Importance of Pitanguy's Technique for the Evolution of Aesthetic Breast Surgery

Juarez M. Avelar

## 1.1 Introduction



Prof. Ivo Pitanguy  
1923–2016

Looking back at the history of aesthetic breast surgery, there are a few publications before the twentieth century that are the basic references on

this field. According to Sinder (2003), Durston, Dieffenbach, Velpeau, Gaillard, and Thomas are the most important publications up to the eighteenth century in which mastoplasty originated. Nevertheless, during the twentieth century great improvements were achieved owing to the useful participation of several authors who introduced important knowledge on reduction mastoplasty. In the early years, Morestin and Gaudet (1905) reported an incision into the inframammary fold for the treatment of mammary hypertrophy. Later, Lexer (1912), Kausch (1916), Kraske (1923), Passot (1925), Noël (1928), and other authors introduced useful surgical steps toward improving mastopexy and reduction mastoplasty. An important reference is attributed to Biesenberger (1928), with an “S”-shaped excision of the lateral portion of the gland and rotation of the remaining glandular pedicle with the nipple attached upward. A remarkable contribution of Schwarzmann (1930) was the fashioning of a periareolar incision for the maintenance of the blood supply to the nipple, which is performed during most mastoplasty techniques. A two-stage operation was reported by Maliniac (1932), among other authors.

Gillies and McIndoe (1939) proposed a V-shaped wedge resection from the upper middle segment of the breast to reduce the incidence of avascular necrosis of the nipple, followed by mobilization of the inner and outer pedicles. Thorek (1942) reported 25 years' experience with free nipple transplantation on reduction

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J.M. Avelar, M.D.  
Brazilian Scientific Institute of Plastic and  
Reconstructive Surgery, Alameda Gabriel  
Monteiro da Silva, 620-Jardim Europa,  
Sao Paulo, SP 01442-000, Brazil  
e-mail: [juarezavelar@bol.com.br](mailto:juarezavelar@bol.com.br);  
[institudoaorelha@uol.com.br](mailto:institudoaorelha@uol.com.br);  
[clinica-avelar@uol.com.br](mailto:clinica-avelar@uol.com.br)



mammoplasty. Strombeck (1960) suggested the maintenance of the lateral pedicle of the nipple–areola complex (NAC) as preservation of the principal arteriovenous and cutaneous nerve system to ensure nipple survival and using a pattern to determine the shape of the breast. Skoog (1963) described a laterally based dermal flap separated from the gland at the subcutaneous level. McKissock in (1972) described his bipedicle vertical dermal flap for nipple transposition. Dufourmentel and Mouly (1961) described a lateral wedge excision of skin, fat, and gland with a resultant lateral oblique scar.

A memorable publication by Pitanguy (1961) reported a horizontal dermal bridge and “keel”-shaped resection of the gland from the inferior and central portions of the breast, creating a “third pedicle,” as he named it, to provide adequate blood supply and nerves to the NAC. As I had the privilege to be trained by Prof. Pitanguy, as a resident during my specialization in his world famous clinic, his knowledge is essential in my practice. During that useful period, I assisted with his operations and took care of his patients during postoperative recovery, which made it possible for me to confirm the excellent surgical results with minimal complications. There were a great number of patients with outstanding results, inconspicuous scars and a well-located NAC, without any sloughing or other complications.

Many plastic surgeons from all over the world used to visit Prof. Pitanguy to observe and learn from him. In fact, in every procedure he used to demonstrate his new techniques, he was always friendly with all visitors, answering questions in several languages as he was fluent in six foreign idioms. He was very kind and polite with everyone when teaching every single detail, whereby it seemed to be quite easy to learn the basic surgical principles. Also, he was happy to explain in several languages any queries presented by the plastic surgeons in the operating room and after each procedure. Undoubtedly, Prof. Pitanguy was so generous in teaching his knowledge and his own techniques. Therefore, in addition to having special opportunity to learn from him during operations,

I also used to have another chance to hear his explanations about the techniques while he performed the operations. Nevertheless, during reduction mastopasty I used to pay even more attention to learn the way in which Prof. Pitanguy demarcated the technique and how he performed glandular resection, which seemed to be very easy. All the time, he explained step-by-step all the surgical principles that are deeply embedded in my mind. For all these reasons, Pitanguy’s technique for reduction mastopasty is essential to my practice.

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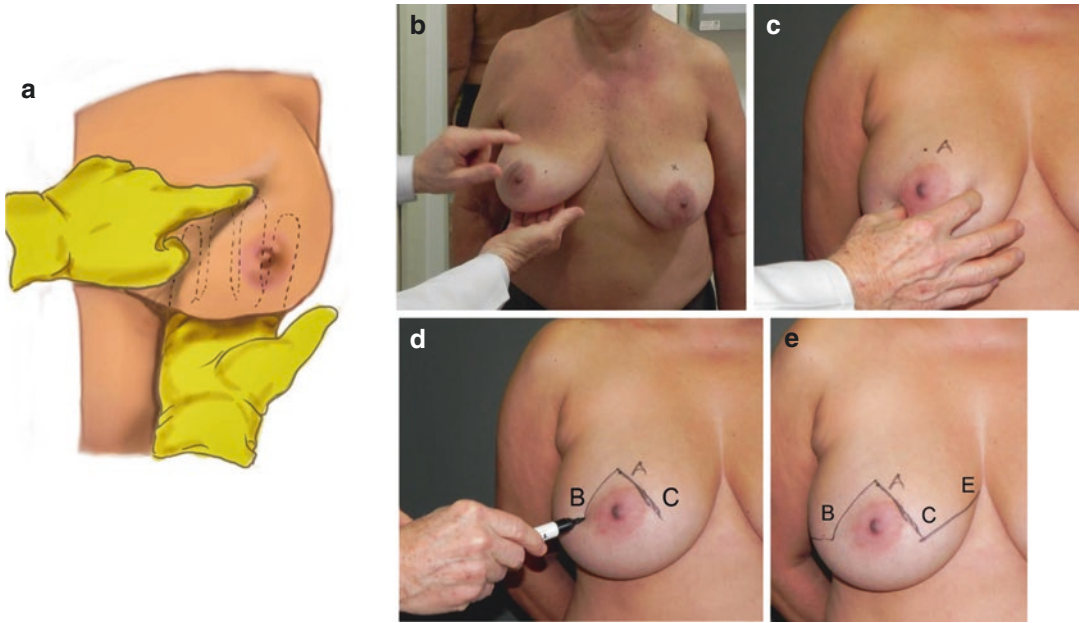
## 1.2 Method

The surgical principles presented by Pitanguy (1961, 1967, 1981) and Pitanguy and Garcia (1972) paved the way for several surgeons to perform his techniques and to introduce personal modifications for evolution of the surgical results. After his original descriptions, the number of publications in the medical literature regarding reduction mastopasty increased enormously. In fact, Pitanguy’s technique is very easy to learn and perform to treat moderate and large mammary hypertrophy.

### 1.2.1 Surgical Principles

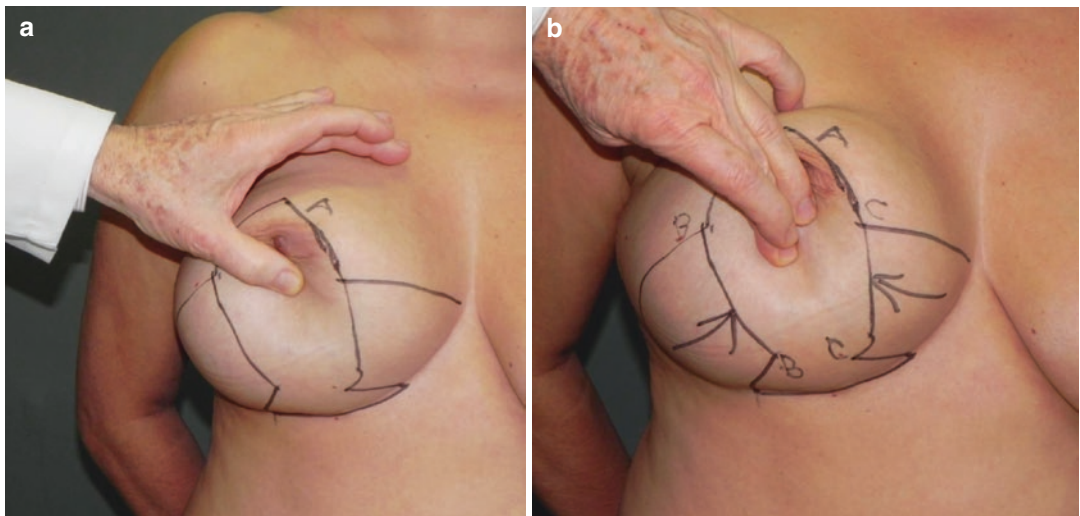
Pitanguy’s technique presents several surgical principles that are responsible for significant improvement in reduction mastopasty, as he described and repeated during every operation, such as:

1. The surgical marking is done according to the surgeon’s creativity with no standard pattern.
2. To determine Pitanguy’s point A is the point of reference for surgical marking (Fig. 1.1). Following his technique, I introduced some modifications to his surgical marking (Avelar 1980, 1993a, b). Thus, the distance between segments AB and AC is much longer compared with his marking (Fig. 1.2). Instead of creating a classic W-shaped marking, my drawing is a long vertical area for skin



**Fig. 1.1** Importance of Pitanguy's point A for surgical demarcation in mastoplasty. (a, b) Drawing and photo show the surgeon's hand to identify the point A. (c, d)

Bidigital maneuver to determine the points B and C. (e) Two lines are marked for the W incisions



**Fig. 1.2** Comparison between Pitanguy's marking and mine. (a) Photo of the right breast after both markings. (b) The same patient showing that my points B and C are very

low. The arrows indicate that the excess skin of the external and internal sides of the breast will be removed in the central area of the breast

resection, as a very small area of skin is resected on the submammary fold (Fig. 1.3).  
 3. The resection of the mammary gland on hypertrophic breasts is performed using a "keel" shape in the medial part of the breast.

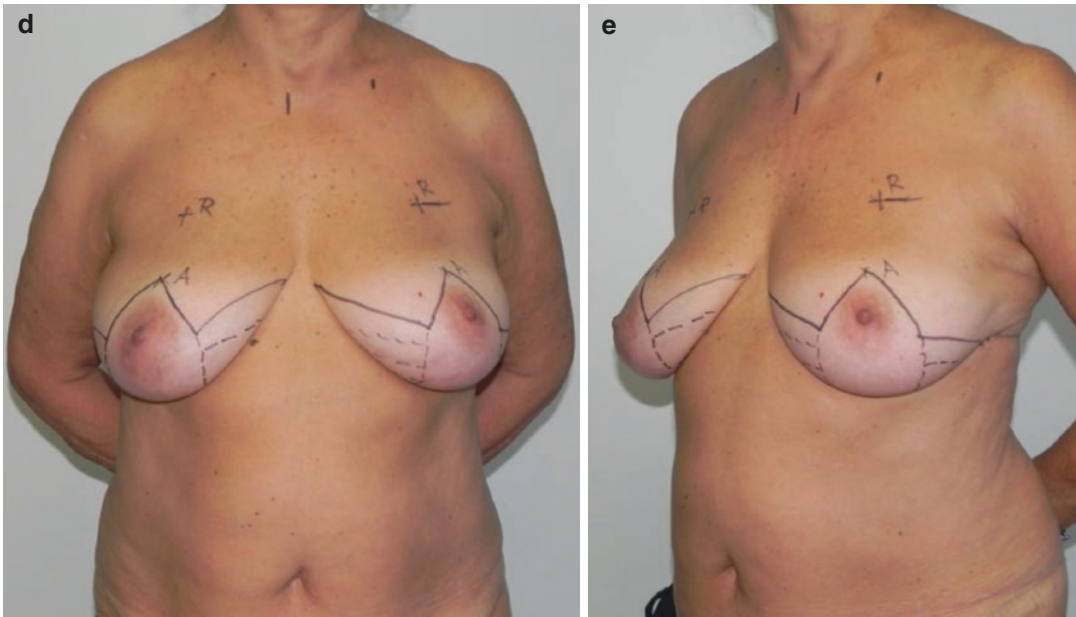
4. The creation of two mammary columns on each side of the breast, which are the essential glands after resection.  
 5. The creation of the "third pedicle" on the upper pole of the breast, which is an important segment

- for improving vascular support to the remaining mammary gland after reduction mastoplasty.
6. The remaining mammary gland maintains anatomical communication with the galactophorous duct together with the nipple.
  7. The two mammary columns are sutured together and to the muscular aponeurosis.
  8. After suturing of the mammary columns, there is no “dead” space.
  9. There is no cutaneous undermining.



**Fig. 1.3** Pre-marking with the patient in a standing position in front of two vertical mirrors. (a, b) She can observe surgical pre-marking in front of the mirrors. (c) Pre-marking is performed: a W drawing can be seen on the left breast and on the right one my marking shows a small area

for skin resection. The lines indicated by the arrows show that the incisions CE and BD are lower so as to reduce the area for skin resection. (d) and (e) Final aspects after pre-marking



**Fig. 1.3** (continued)

### 1.2.1.1 Surgical Marking

Surgical marking in Pitanguy's technique is done with the patient in a semi-sitting position in the operating room (Fig. 1.4). According to the history of mastoplasty, Gillies and McIndoe (1939) were the first authors to perform surgery with elevation of the patient's head on the operating table. Besides, the same authors used to measure the patient's chest for surgical marking, taking as references the sternal notch and the xyphoid process. Thus, Prof. Pitanguy introduced this routine into his practice and consequently to all surgeons who were trained by him, even those visitors who used to observe his operations. Therefore, surgical marking before reduction mastoplasty became an artistic methodology that is individual to each surgeon, who has the freedom to perform all marking according to each individual patient without any rigid points or a standard pattern. He or she may

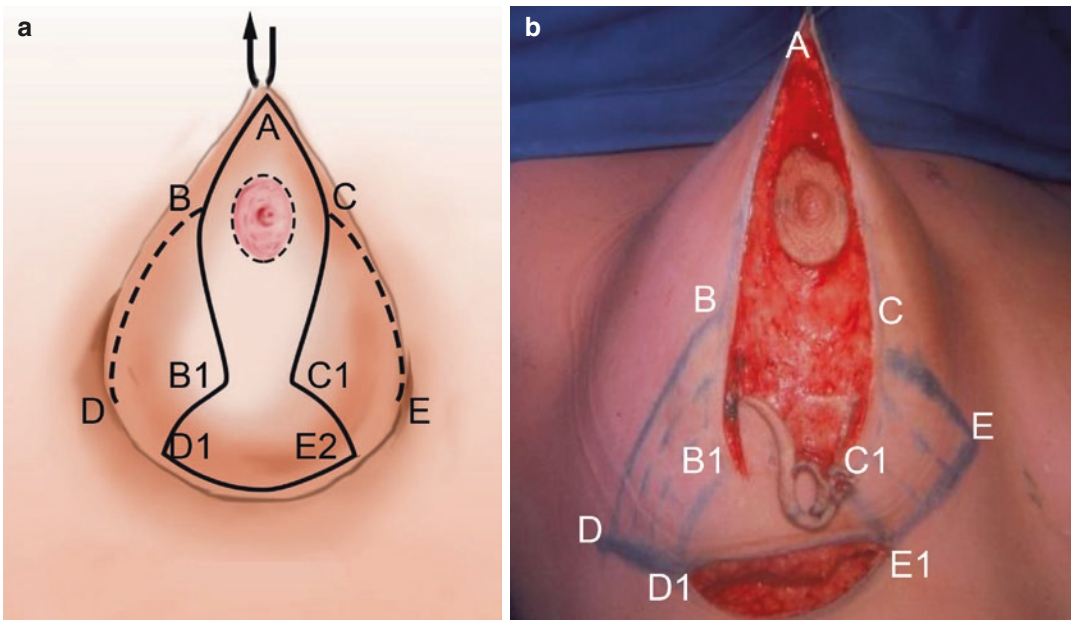
employ his or her creativity in establishing the future area for skin resection and that of the mammary gland. In this way, the measurement of the breasts and chest using a ruler or a graduated tape became a matter of routine during surgical marking. Aufrecht (1949) reported a geometric method of demarcating the incisions in breast surgery. He showed the relationship between the excision of the wedge-shaped infra-areolar area and the height of the mammary cone. He also mentioned the use of long temporary stitches in the skin at the sternal notch and the level of the xyphoid process to transfer from one side to the other for symmetrical skin marking. Another important contribution was published by Fernandez (1951), in which he used a ruler placed between the breasts and thorax, to mark the new location of the NAC at the level of the infra-mammary crease at the hemi-mammary line.

### 1.2.1.2 Pitanguy's Point A

Pitanguy's point A is the point of reference for surgical marking. It is located on the vertical line from the midclavicular point passing by the nipple and is the projection of the submammary sulcus of the breast. The surgeon uses one hand under the breast on the submammary sulcus with his finger directed forward, and with the index finger of the other hand the surgeon touches the tip of the finger of the hand placed under the breast (Fig. 1.1). Thus, this place is Pitanguy's point A. From point A, two oblique lines pass down each side of the breast to determine the points B and C and to establish the amount of skin and mammary gland that will be resected (Fig. 1.1). Nevertheless, as described above, in my marking, the lines AB and AC are drawn lower to reduce the area of skin for resection (Fig. 1.4). Therefore, during surgery a smaller area of skin is resected.

### 1.2.1.3 "Keel" Resection

By performing Pitanguy's resection, it is possible to remove the excess mammary gland in accordance with the surgeon's surgical planning, without causing any damage to the vascular network to the remaining parenchyma (Fig. 1.5). The main glandular resection is performed on the center of the breast, which Pitanguy named a "keel" resection. The lateral prolongations of the base of the mammary gland on each side (medial and lateral) are also resected at the same bloc (Pitanguy, 1959). Through such resection, the remaining parenchyma maintains its natural vascularization without any damage to the NAC blood supply. According to Pitanguy's publications the base of the hypertrophic breasts is the main bloc, which may be carried out without undermining any cutaneous or mammary tissue. By performing a "keel" resection, it is possible to reduce the



**Fig. 1.4** Surgical marking during surgery. (a) Drawing shows a comparison between Pitanguy's marking with dotted lines (A, B, C, D, E) and mine with continuous lines (A, B1, C1, D1, E1). Between the two lines the amount of skin that is not resected during my approach

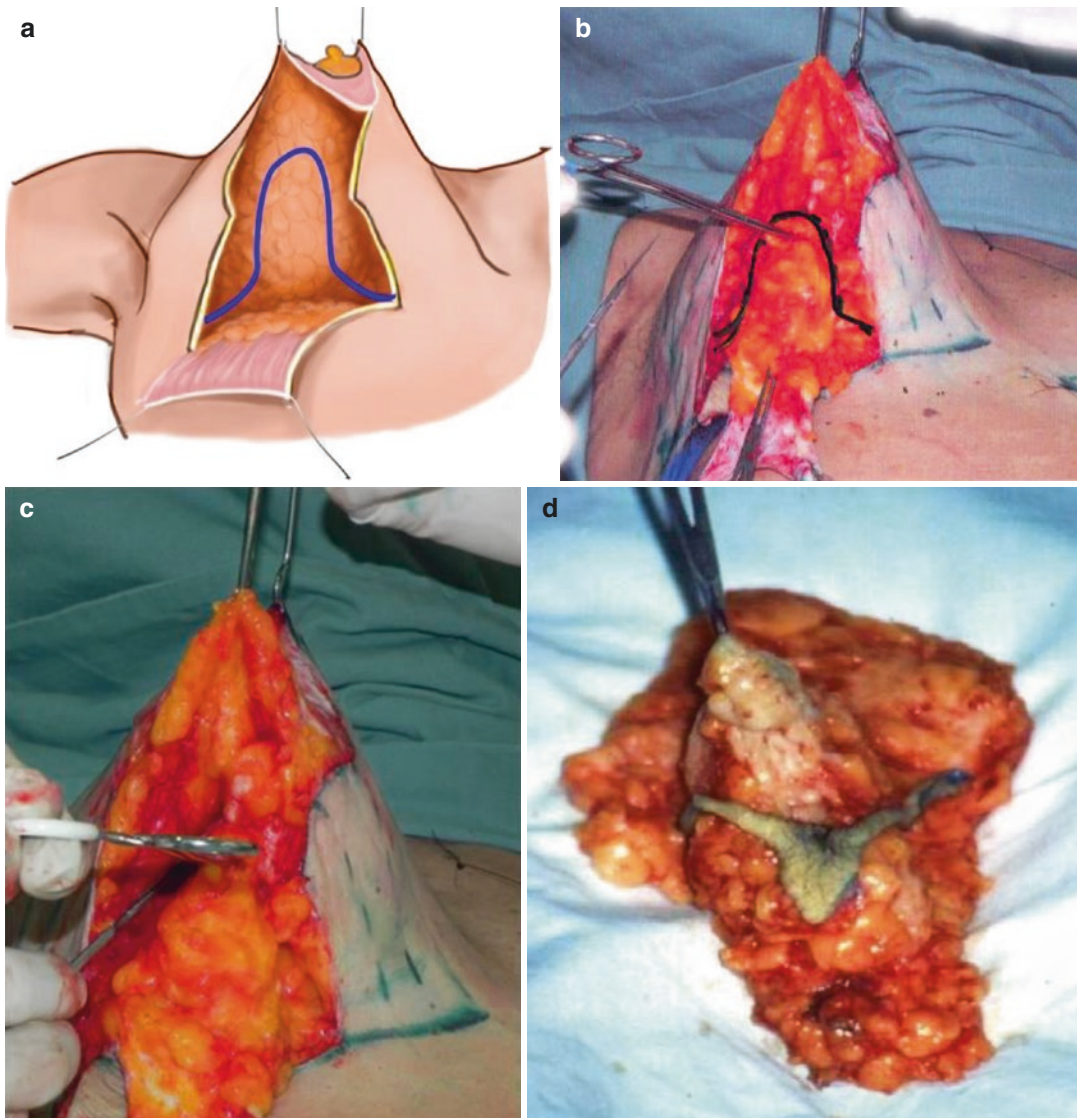
can be seen, as only the rocket-shaped central area of the breast will be resected. (b) Photo during surgery shows that the breast is pulling up with Pitanguy's marking in comparison with my marking. The central area is already de-epithelialized and the area of skin preserved

width of the breast as much as necessary. Pitanguy also used to call his approach to the removal of excess mammary gland “gothic cathedral resection.”

#### 1.2.1.4 Creation of Two Columns

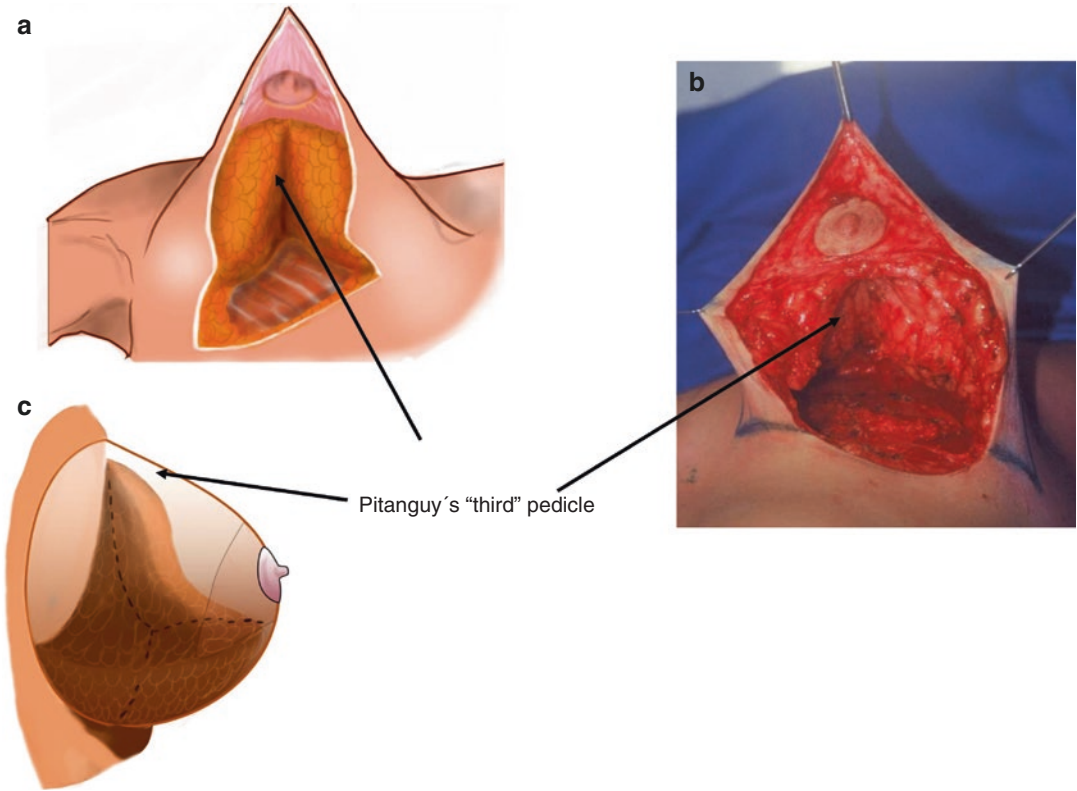
After “keel” resection, two mammary columns on each side of the breast are created, which is the essential glandular

tissue after resection. Those two columns represent the natural connection with the galactophorous ducts, providing natural lactation after surgery. According to my marking, the skin that is not resected corresponds to the shape of the two columns created after glandular resection (Figs. 1.4, 1.5, and 1.6).



**Fig. 1.5** Pitanguy's “keel” resection during mastoplasty. (a) Drawing shows that the central area is de-epithelialized and the “keel” resection area is marked with *blue*. (b) Photo during surgery shows the marking of the “keel”

resection. (c) “Keel” resection with knife is being carried out. (d) A quantity of glandular tissue was removed and a small area of skin was resected



**Fig. 1.6** Creation of Pitanguy's "third" pedicle. (a) Drawing shows remaining glandular tissue after resection; the arrows indicate the "third" pedicle. (b) Photo during surgery showing the "third" pedicle created after glandu-

lar resection. (c) Drawing in the profile view showing "keel" resection with preservation of the subcutaneous layer on top where the "third" pedicle is created

#### 1.2.1.5 Creation of the "Third Pedicle"

Creation of the "third pedicle" on the upper pole of the breast is one of the main surgical principles of Pitanguy's technique, as the "keel" resection of the mammary gland must preserve the cutaneous and subcutaneous layers on the upper pole of the breast (Fig. 1.6). In fact, the resection of the parenchyma must be performed carefully so as not to damage the vascularization and innervation as well. The "third pedicle" provides adequate blood supply and innervation, which maintain normal sensitivity to the NAC postoperatively. If this surgical principle is not adequately followed, the final aesthetic result may cause partial or total necrosis of the NAC.

#### 1.2.1.6 Anatomical Communication Between the Galactophorous Duct of the Mammary Tissue and the Nipple

According to Pitanguy's "keel" resection and the creation of two columns, the remaining mammary gland maintains anatomical communication between the galactophorous duct and the nipple. Therefore, patients maintain normal lactation after the operation, as the remnant mammary gland may provide regular secretion after reduction mastopasty (Fig. 1.6).

#### 1.2.1.7 Suturing of the Two Mammary Columns

The two mammary columns are sutured together and to the muscular aponeurosis, similar to Malbec and Quaife's (1957) suggestion to fixate breast tissue to muscle during mastopasty. The glan-

dular resection is performed according to each individual patient following surgical marking; particularly in asymmetrical breasts, it is possible to achieve a good balance between the two sides afterwards. In such cases, it is a fundamental step to create two similar columns on each breast to reinstate similarity after operation (Fig. 1.6).

#### 1.2.1.8 There Is No “Dead Space”

After suture of the mammary columns there is no “dead space.” After resection of the excess mammary tissue, suturing between the remaining glandular tissue and the aponeurosis of the pectoralis major. For this reason, it is not necessary to use drainage after the operation (Fig. 1.6).

#### 1.2.1.9 No Cutaneous Undermining

This surgical principle is related to the embryological development of the breast, as it originates in dermal structures. Glandular parenchyma maintains a natural connection with the dermis, which provides a normal blood supply, avoiding bleeding and hematoma formation.

### 1.2.2 Surgical Marking

Before performing mastoplasty, it is a fundamental step to provide careful surgical marking. Prof. Pitanguy, with all his knowledge and experience, used to carry it out with the patient on the operating table under general anesthesia in a semi-sitting position. Although I used to assist him during my period of training, my preference is to perform a pre-marking at the office 1 day before the operation (Avelar 1993a). Some of the reference points are marked with the patient in the standing position in front of two vertical mirrors placed one in front of the other (Figs. 1.3 and 1.4). First, a point is marked at the center of the sternal notch. Another two points are marked laterally 7 cm away on each side in the midclavicular area. From these points, a line is pulled downwards passing the center of the nipple of both breasts. On this line a point is marked on the projection of the submammary fold (Figs. 1.1 and

1.2). This is Pitanguy's point A. The submammary folds are drawn to determine the final scars after surgery. These reference points are marked with ink and it is recommended that the patient preserves them until the next day. She can take a shower, but must be careful to maintain the reference points to help the surgical marking during the operation.

I found the pre-marking very useful, as the patient is awake and observes my work by watching in the mirrors (Fig. 1.3). At that time, I am able to examine all the surgical details that were registered during the first consultation. Also, the patient signs the consent forms.

In 1949, Aufricht proposed geometric methodology as pre-surgical marking for breast operations, which has been employed by several authors. At that time, a prefabricated pattern was a very common approach. Following Aufricht's marking, Fernandez (1951) employed a ruler to measure the reference points on the chest and breast to achieve adequate projection after mastoplasty.

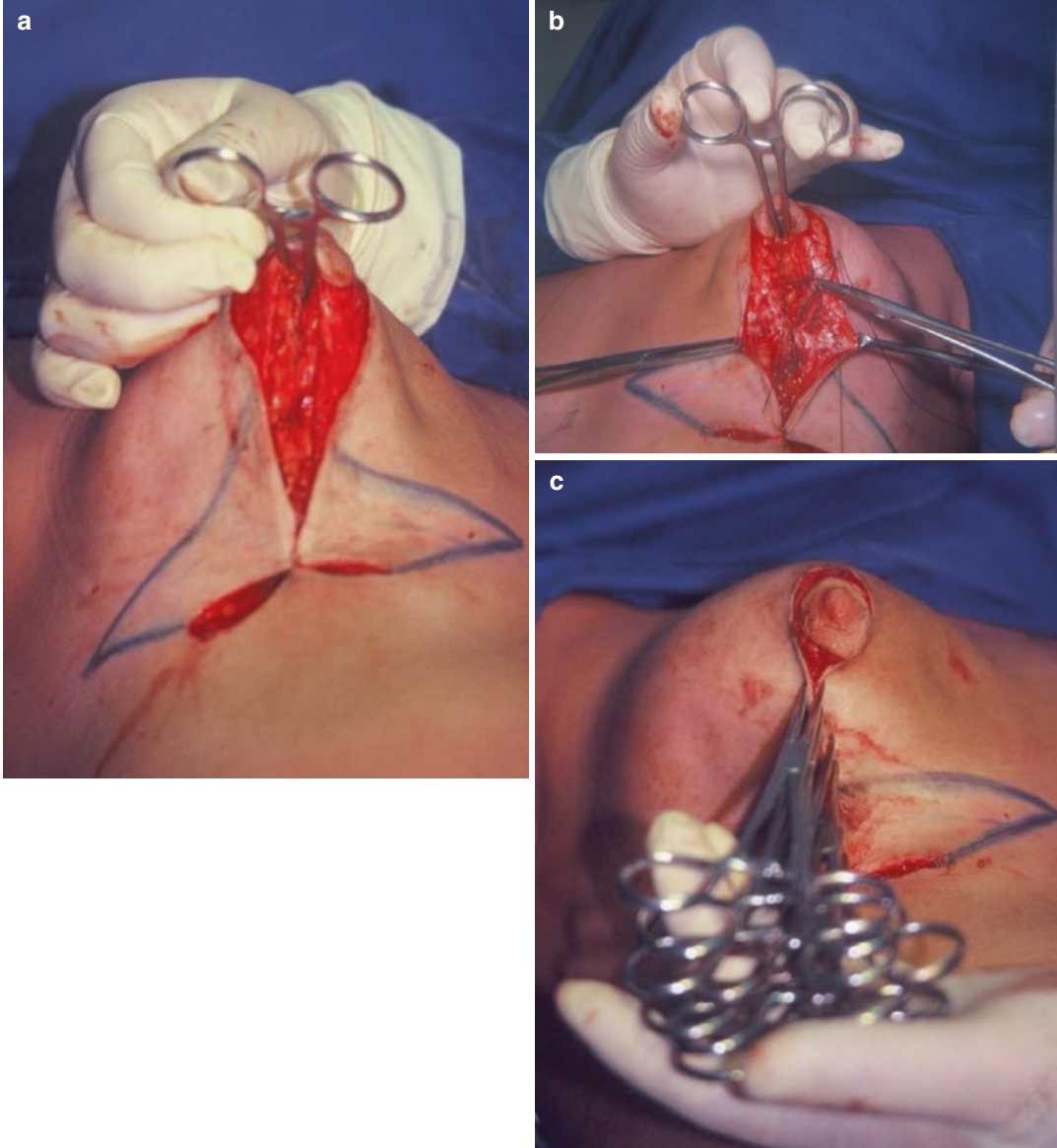
During the operation, surgical marking is done with the patient on the operating table under general anesthesia or local anesthesia combined with intravenous sedation under the care of an anesthesiologist. The pre-marking is very useful for performing the definitive surgical marking. A vertical line is drawn from the midclavicular point, passing through the nipple and inframammary crease (Figs. 1.2 and 1.3). The inframammary crease is also marked on each side. The nipple site (Pitanguy's point A) is identified on the midclavicular line by placing the index finger in the submammary fold and marking the point on the skin surface. The point A does not represent the exact center of the future nipple, but it is the point very near to where the nipple will be when the operation is complete. Precise nipple placement is made at the end of the operation. The amount of breast tissue to be resected is determined (Figs. 1.4 and 1.5) by grasping the breast with the thumb and index finger to establish fixed reference points B and C. These two points should not be placed higher than a transverse line passing through the nipple. According to my surgical marking, the points B and C are located much lower than in the classic Pitanguy's technique, as the skin resection is much smaller in the vertical dimension to achieve a shorter scar



(Fig. 1.4). The lengths of the distances AB and AC are not equal on both sides, even on the same breast, particularly in cases of asymmetric breasts as they are unusual in shape, thus requiring asymmetrical markings (Fig. 1.4b, c).

Points D and E represent the lateral and medial extremes respectively of the lines of

resection that are marked at the ends of the infra-mammary incision (Figs. 1.1 and 1.2). Lines CE and BD can be straight or curved, as determined for the individual breast. Points B and C are in part determined by estimating the amount of skin and breast tissue to be removed by folding the breast (Fig. 1.7).



**Fig. 1.7** Sequential photos during surgery showing that forceps is introduced inside the breast and lifted up where skin area preserved according to my marking can be seen. (a) The two columns were already sutured to the pectoralis muscle and a temporary stitch was inserted at points B

and C on the medial part of the breast. (b) Dermal flaps were dissected on each side of the vertical incision and sutured one to another. (c) The excess skin was pulled forward and held by forceps at the central area of the breast

### 1.2.3 Glandular Resection

The operation is performed following surgical marking for the resection of mammary tissue and excess skin. With both hands, the surgeon's assistant holds the breast by its base or a strong elastic tape is wrapped around it to expose the NAC, then Schwarzmann's maneuver (1930) is performed. Afterward, using a strong hook on the point A the breast is pulled upward for skin resection (Fig. 1.5) and to remove glandular tissue following Pitanguy's technique in the shape of a "keel" in the medial part of the breast, with two wedges on each side (Fig. 1.5). After glandular resection two columns are created on each side of the breast. The skin that is not resected in my procedure corresponds to the two columns created after glandular resection (Figs. 1.2, 1.4, and 1.5b, c). The width of the "keel" and the base of the two columns constitute the amount of glandular resection that will be provided. The thickness of the columns comprises the remaining mammary tissue.

### 1.2.4 Creation of the "Third" Pedicle

As far as the glandular tissue is resected following Pitanguy's technique, a "third" pedicle is created on the superior segment of the breast, which is the thickness of subcutaneous tissue between the two columns (Fig. 1.6). This is an important structure for aiding the vascularization to the NAC, even though there is no cutaneous undermining.

### 1.2.5 Suture of Mammary Tissue to Pectoralis

Careful hemostasis is carried out so that glandular suturing can be performed. My "Z" instrument or forceps is introduced under the remaining glandular tissue between the two columns (Fig. 1.7) and the surgeon's assistant pulls it up to perform suturing of both columns to the aponeurosis of the pectoralis muscle, which avoids any "dead space."

This sort of fixation was recommended by Ragnell (1946) and later by Malbec and Quaife (1957), and is a useful step during operation.

Afterward, a temporary stitch is inserted to approximate the points "B" and "C" on the midline of the submammary crease to allow evaluation of the size and shape of the future breast (Fig. 1.7).

### 1.2.6 Repositioning the New Nipple–Areola Complex

Determining the new position of the NAC is an important step during the mastoplasty operation. By dissection of the dermis, I introduced suturing of the dermal flaps created on both sides of the vertical segment of the breast. The dermal flaps are sutured with isolated stitches creating a dermal structure that functions as reinforcement of the vertical suture to adjust content and container (Avelar 1980, 1993a, b). Afterward, using special forceps, the skin is pulled forward to evaluate the exact amount of excess to be resected, as performed by Noël (1928), which is a useful procedure. The NAC is drawn on the vertices of the new breast using a special round marker. The NAC is pulled from the depths to the exterior and sutured on the new areolar area.

The surgical wound is then closed with a running suture and adhesive tapes are placed on it. Finally, the area is bandaged.

## 1.3 Discussion

Each surgeon must follow a specific technique to employ in all cases of reduction mastoplasty or mastopexy. As long as he or she follows the same surgical principles, it is possible to accumulate sufficient knowledge during each operation. This concept is a fundamental step, which is an essential guideline that gives correct orientation to perform the reduction mastoplasty.

Pitanguy's technique is easy to learn and to perform and there are no prefabricated patterns to determine the cutaneous incisions and glandular resection. Surgical marking is a fundamental step, which is done according to the surgeon's creativity and imagination for each patient. It is a versatile method, especially for medium and large hypertrophic breasts. Even in the case of asymmetry, it is a useful procedure, as the marking requires particular attention to the amount of skin and glandular tissue to be resected according to each breast. The surgical principles of the technique are very precise and must be followed during planning and when performing the operation.

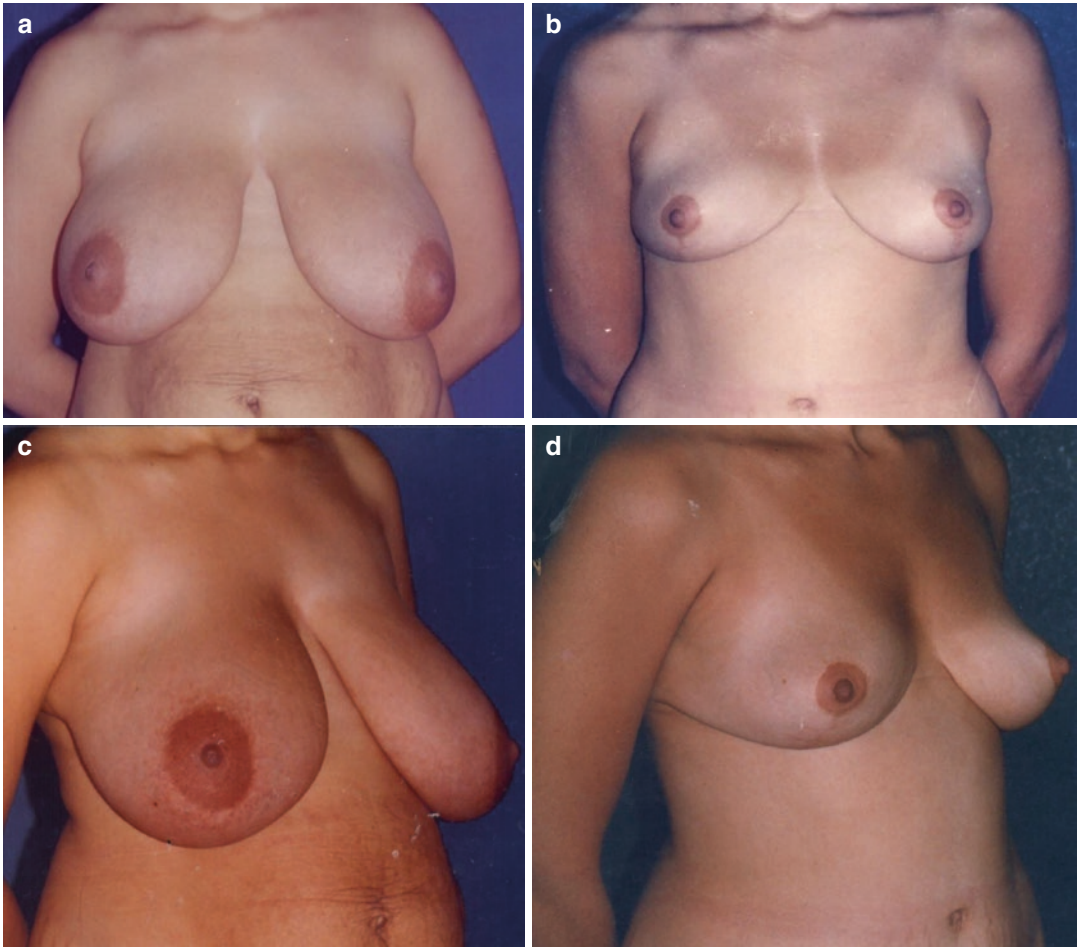
Because of the versatility of the technique, it gives adequate support to several surgeons in developing new approaches as long as the essential surgical principles are preserved. My personal procedure follows Pitanguy's technique, to which I introduced some surgical detail to reduce the size of the scars; thus, the incisions on the submammary creases are very short as a great amount of cutaneous resection is carried out, pulling the skin to the medial part of the breast.

It is important to emphasize that the Pitanguy's point "A" does not represent the exact center of the future nipple after surgery, but it is a reference point very close to where the nipple will be when the operation is complete. The final marking of the precise nipple placement is performed after suturing of the two columns of the mammary gland and the skin is temporarily sutured (Fig. 1.7). It means that the nipple is placed on the vertices of the cone shape created after internal suturing of the breast tissue, and the excess skin is resected at

the end of the operation. The "third pedicle" of the technique is an essential anatomical detail that is important support for adequate blood supply to the NAC. In fact, it is the superior pole of the breast located between the upper parts of the two glandular columns created during tissue resection.

During surgical marking, the surgeon may determine the amount of breast tissue to be resected by establishing fixed reference points, which are marked, even in cases of slight or severe asymmetry.

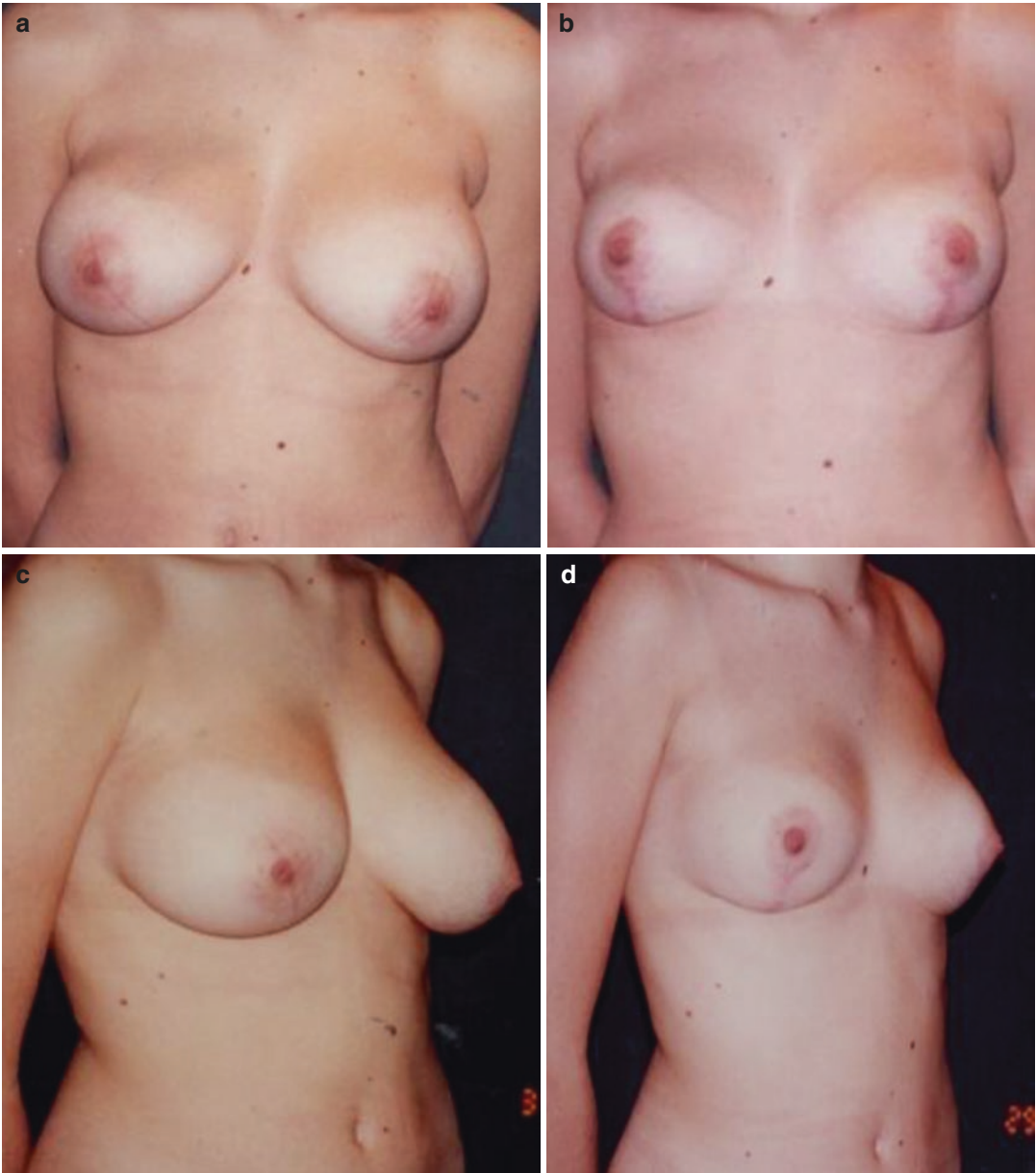
There are several advantages of Pitanguy's technique: it is easy to learn and employ, the flexibility in nipple positioning during marking and intraoperatively, the preservation of lactation in most patients, an excellent breast shape can be achieved, a very low rate of complications, and no "dead space" after suturing of the remaining mammary tissue. In summary, it is a free-handed approach to measurement and resection. The flexibility of the method is one of the most attractive features of the operation for the experienced surgeon, to create a new skin brassiere so as to achieve a good balance between the content and the continent. As I was Prof. Pitanguy's resident during my period of specialization, all surgical principles of the technique are clear in my mind. Also, I am convinced about the efficiency of the technique as I can bear testimony to the excellent results he used to achieve and the very high rate of patient satisfaction. For all those reasons, I have employed his technique since the beginning of my practice, with very small modifications, leaving nice scars located on the submammary folds (Figs. 1.8 and 1.9).



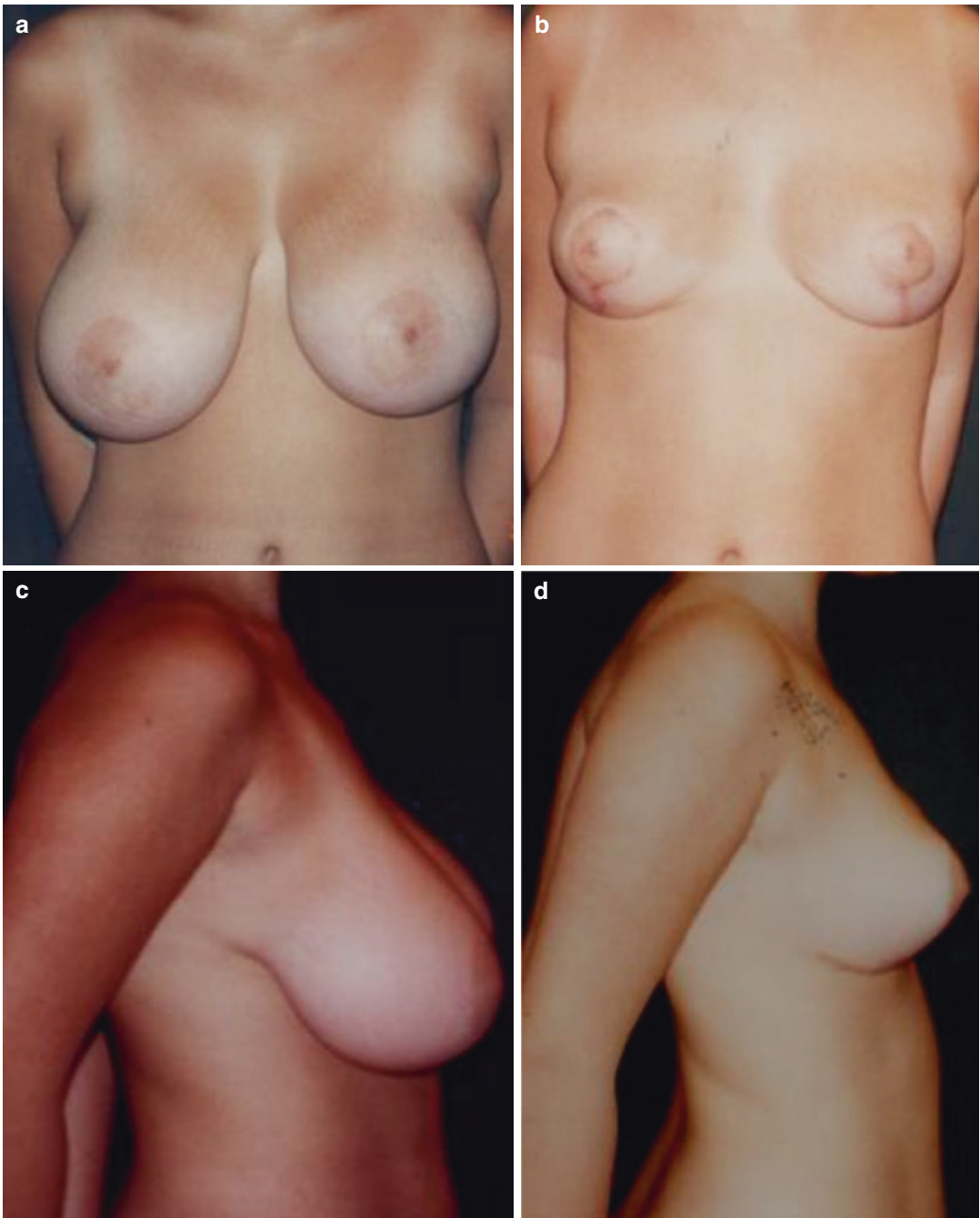
**Fig. 1.8** A 35-year-old patient with large and ptotic breasts underwent reduction mastopasty. (a) and (c) Photos before surgery. (b) and (d) Photos after the operation

If a surgeon does not have enough experience with the technique, he or she must exercise caution during all the surgical steps: marking, skin incisions, mammary tissue resection, and sutur-

ing of the columns of the remaining glandular tissue. Nevertheless, following the surgical principles of the technique, it is possible to achieve good results (Figs. 1.10 and 1.11).

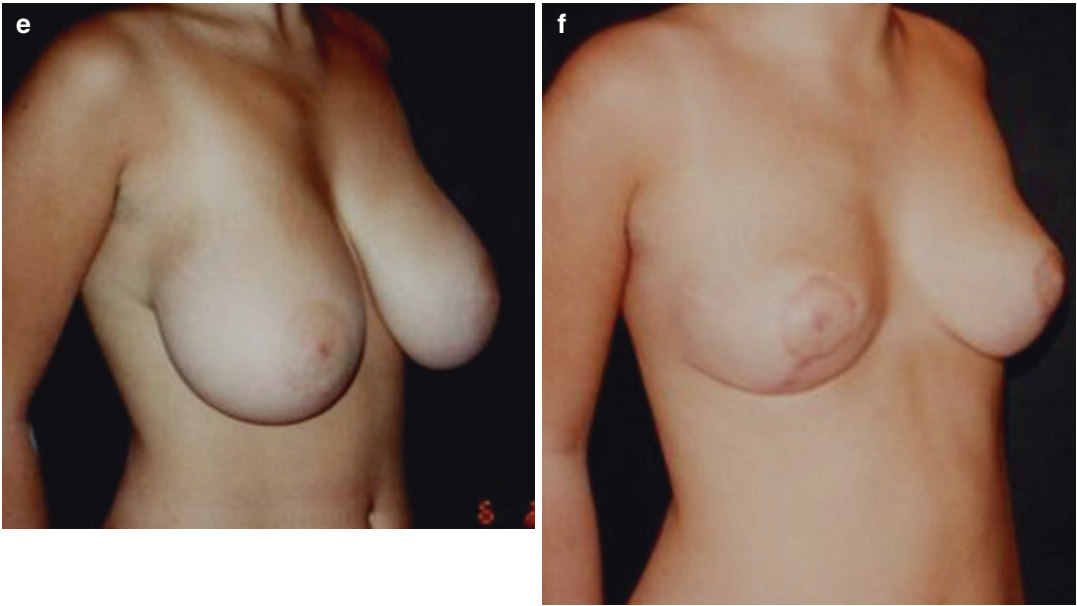


**Fig. 1.9** A 28-year-old patient presenting asymmetric breasts underwent mastoplastic. (a) and (c) Photos before surgery. (b) and (d) Photos after operation

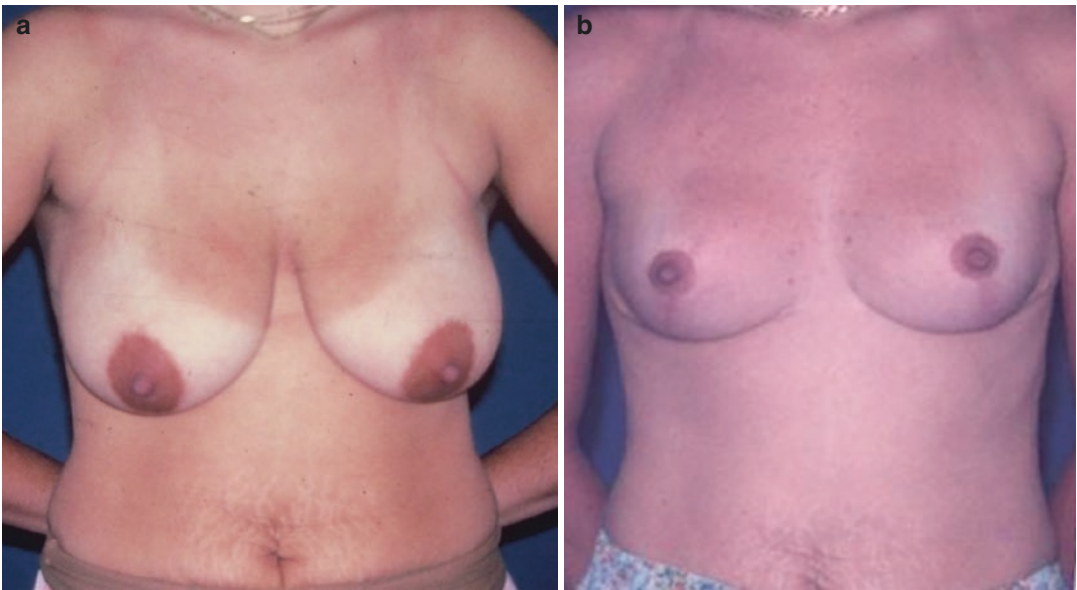


**Fig. 1.10** A 25-year-old patient presenting asymmetric breasts with bilateral hypertrophy and severe ptosis with physical repercussion for her chest. **(a, c, e)** Photos before

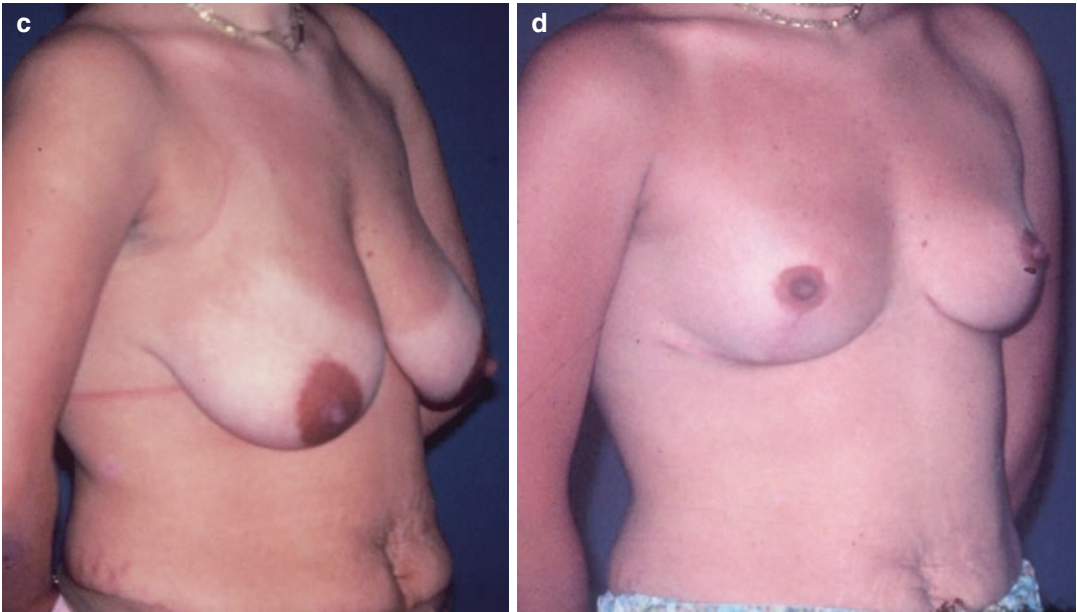
surgery. **(b, d, f)** Photos after reduction mastoplasty with resection of 950 g on the right side and 650 g from the left breast



**Fig. 1.10** (continued)



**Fig. 1.11** A 28-year-old patient presenting moderate hypertrophy with ptotic and flabby breasts underwent mastoplasty. (a) and (c) Photos before surgery. (b) and (d) Photos after the operation



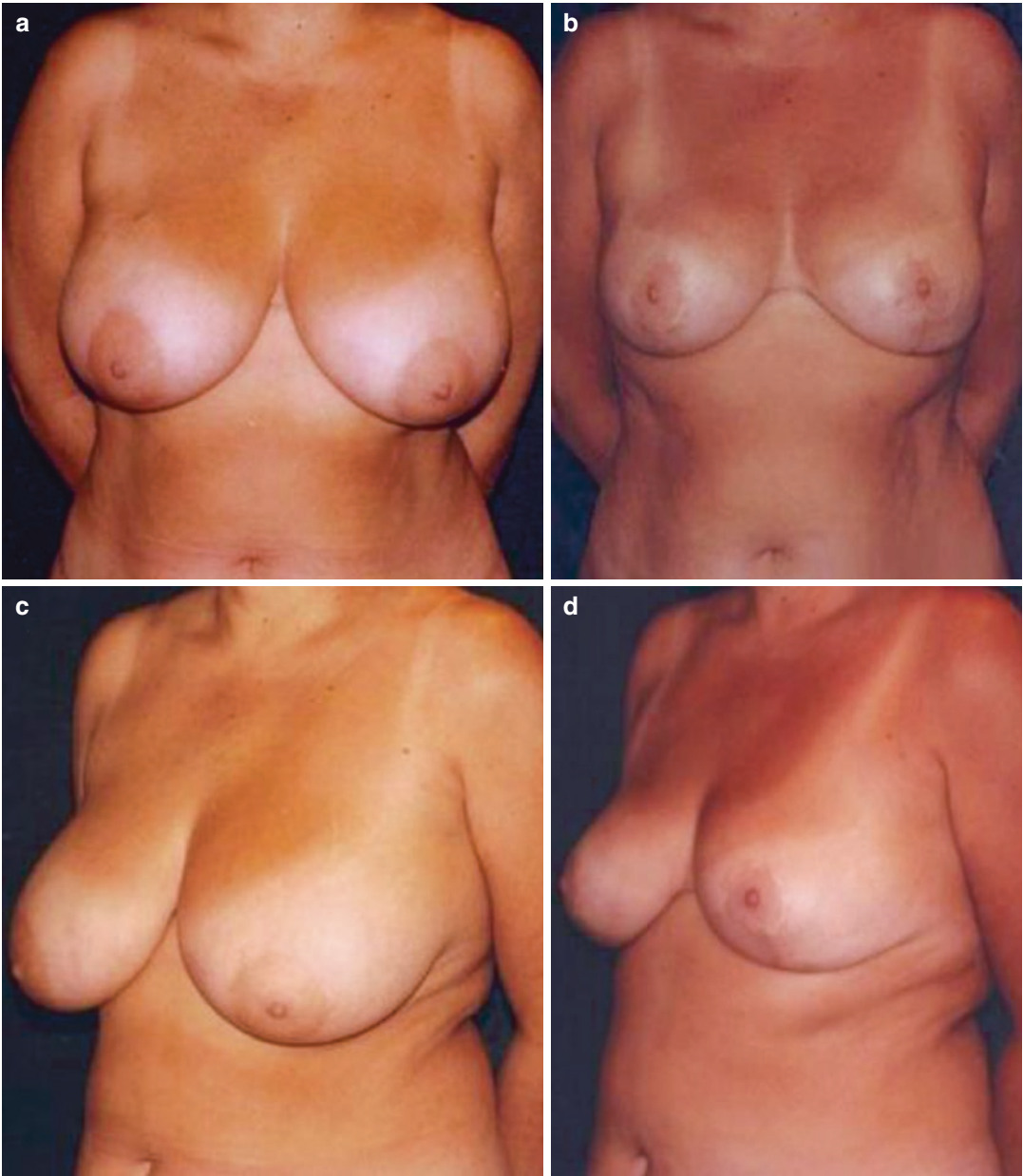
**Fig. 1.11** (continued)

### Conclusions

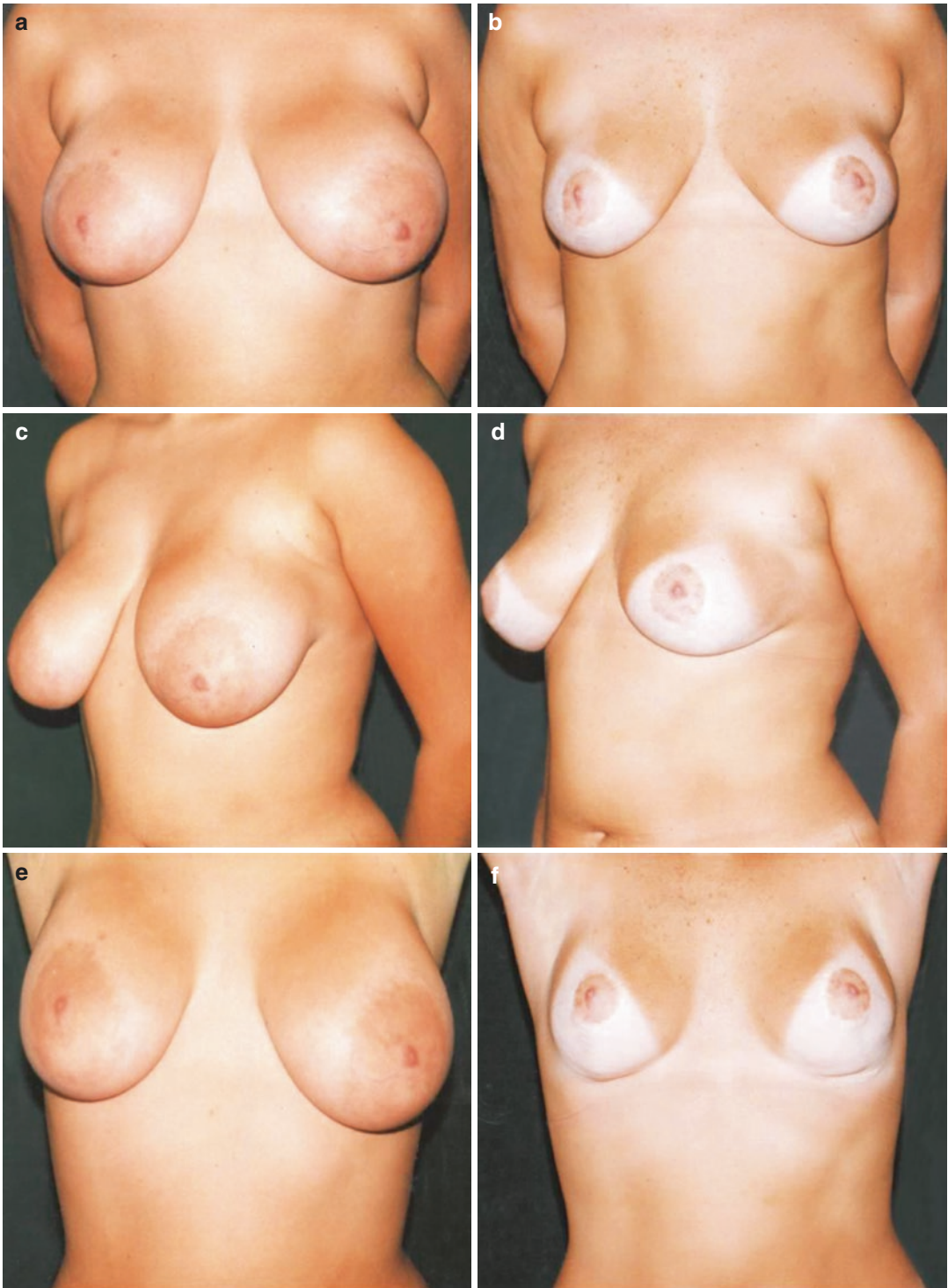
To my knowledge, there are two periods in the history of reduction mastoplasty: before and after 1960, when Pitanguy introduced his technique. Up to 1960, there were useful procedures that formed the technical platform for great development, particularly in breast reduction. I know several other techniques that were described before and after

Pitanguy's publication, but I am so used to employing his technique. So far, since the beginning of my practice, I have introduced several technical modifications with regard to surgical marking with repercussions for glandular resection. As asymmetric breasts are very common, Pitanguy's technique is adequate for achieving well balanced results (Figs. 1.12 and 1.13).





**Fig. 1.12** A 51-year-old patient presenting moderate hypertrophy with asymmetrical, ptotic, and flabby breasts underwent mastoplastic. (a) and (c) Photos before surgery. (b) and (d) Photos after the operation



**Fig. 1.13** A 19-year-old patient presenting asymmetric breasts with moderate hypertrophy and ptosis. (a, c, e) Photos before the operation. (b, d, f) Photos after reduc-

tion mastoplasty with resection of 280 g on the right side and 580 g from the left breast

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# The Pitanguy Technique for the Surgical Treatment of Breast Hypertrophy

Sérgio Carreirão

## 2.1 Introduction

Pitanguy's technique for the surgical treatment of breast hypertrophy was introduced into the world literature in the early 1960s (Pitanguy 1978, 1960, 1961).

The procedure has been considered one of the most popular used for the treatment of breast hypertrophy. This has not occurred by chance and therefore deserves a critical evaluation.

I worked with Professor Pitanguy for 35 years without interruption, performing and teaching his technique. Thus, I had the opportunity to observe the evolution of the technique and now intend to show my point of view.

These are the main basic principles:

- The mammary flaps of the procedure must maintain its connection to the overlying skin.
- Undermining of the flaps is consistently reduced.
- The inferior pole of the breast is removed, preserving the “adipose capsule of the superior pole of the breast”
- A keel-shaped glandular resection is performed, allowing a wide elevation of the nipple-areola complex (NAC)
- Dead spaces in the new breast are eliminated.

Since then, Pitanguy has presented important papers that have consolidated the technique (Pitanguy 1978, 1967, 1981).

## 2.2 History

In 1959, Pitanguy proposed some modifications to Arié's technique for breast reduction (Pitanguy 1978). In 1960, Pitanguy published his personal technique (Pitanguy 1960).

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S. Carreirão, M.D.  
Brazilian Society of Plastic Surgery (TSBCP),  
Sao Paulo, SP, Brazil

Brazilian College of Surgeons (ECBC),  
Rio de Janeiro, RJ, Brazil

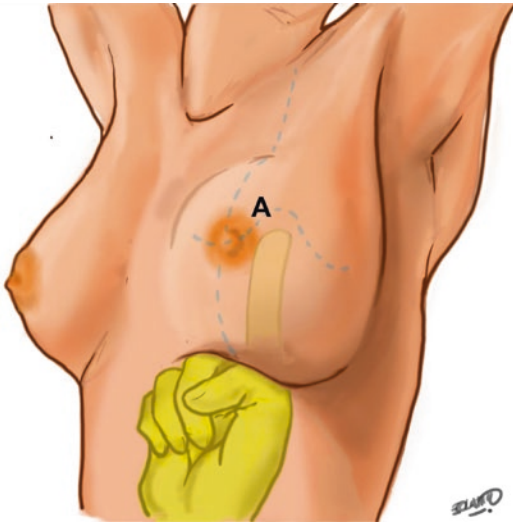
American College of Surgeons (FACS),  
Chicago, IL, USA  
e-mail: [scarreirao@hotmail.com](mailto:scarreirao@hotmail.com)

## 2.3 The Pitanguy Technique

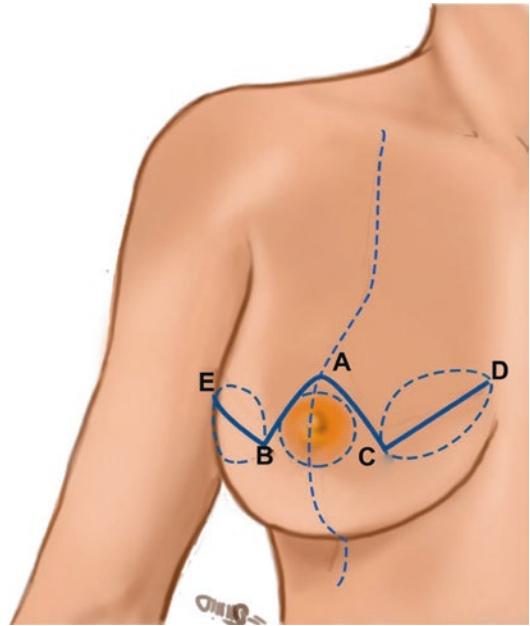
This technique is described in important papers published by Pitanguy (1978, 1967, 1981).

The surgical steps are as follows. Initially, a vertical line is drawn from the midpoint of the clavicular bone to the nipple (it is named the mid-clavicular line). On this line point A is marked at a level just below the projection of the inframammary fold, as shown by the finger in Fig. 2.1. This point marks the final position of the NAC, which is situated slightly above and laterally to this point, in the middle of the mammary cone.

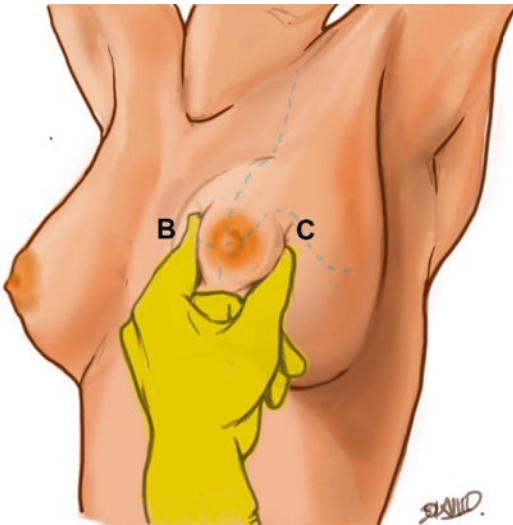
To determine the amount of tissue to be resected, the breast is manually grasped and the points B and



**Fig. 2.1** Point A marked on the midclavicular line at the level just below the projection of the inframammary fold



**Fig. 2.3** The lines AB and AC are drawn. Points D and E are marked at the medial and lateral extremity of the inframammary fold respectively. Lines connecting points B–D, and C–E are drawn (see text)



**Fig. 2.2** To determine the amount of tissue to be resected, the breast is manually grasped and the points B and C are marked

C are marked (Fig. 2.2). The points can vary (range) according to the indications of each case. Pitangy advises that the AB and AC distances should not be greater than 6–7 cm and that B and C points should not be placed higher than a transversal line passing the nipple. The distance between points B and C varies according to the amount of tissue to be removed. The lines AB and AC are drawn. Points D

and E are marked at the medial and lateral extremities of the inframammary fold respectively. Lines connecting B–D, and C–E are drawn. BD should not exceed the anterior axillary line. CE should not reach the median external line (Fig. 2.3). The skin area to be resected is now determined. The position and size of the NAP are evaluated using sizers that vary in diameter.

Breast distention is performed allowing Schwartzman's maneuver around the areolar skin. The skin of the ABC triangle is undermined (Fig. 2.4).

Forceps placed at point A raises the breast. CD and BE incisions are performed deep to the muscular fascia. Another incision is performed from point B to point C. Then, a keel-shaped glandular resection is performed, starting below the areola and preserving the adipose capsule, which Pitangy considers a third pedicle (Fig. 2.5). Resection is made in one single block including skin and adipose and glandular tissues. After the desired resection, two columns or pillars (medial and lateral) are identified and put together in the middle of the breast. The breast