History of Breast Reduction

6

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The history of mammaplasty has been reported for several centuries , but there are few reports; therefore, it deserves careful study to understand the value of the surgeons who worked in adverse surgical conditions. Currently, breast reduction is a very frequent intervention in our country, but not in other countries. Numerous authors with their publications and papers presented at conferences and scientific meetings attest to its great importance. Surgery should be performed safely to reduce or even avoid complications that may be harmful to patients and surgeons. Mammaplasty aims to produce a breast with natural, proportional volumes and minimal scars and challenges the creative ability of the surgeons devoted to it and that seems to have no limits. There is no doubt that it is a constant challenge to the plastic surgeon and consists of a set of techniques or a combination of surgical maneuvers that enriches the medical literature. Among them, we can mention some that have become classic, such as the skin incision marked in a W shape; peri-areolar de-epithelialization or Schwarzmann's maneuver; the longitudinal fusiform infra-areolar incision, oblique and/or transverse; undermining and incisions of the adipose–glandular tissue at the base of the breast; the use of various types of areolar and de-epithelialized flaps with proximal, distal pedicle, and superomedial and superolateral to transpose the nipple–areola complex (NAC).

The purpose of this chapter is to report the contributions of a large number of highly qualified professionals who are interested in this surgery. However, just to remind us of the extensive existing literature, we reviewed numerous publications presented below in chronological order. It is not a complete list, because the goal is not to exhaust the subject. We apologize if equally as significant or more important works are not mentioned.

625–690 AD**—Paul of Aegina (Sinder 2003).** According to Letterman and Schurter (1974), the first description of breast reduction was written by Paul of Aegina, or Paulus Aegineta, for the surgical correction of gynecomastia with tissue resection of the excess of tissue at the level of the inframammary crease.

1556**—Paulus.** *Medicinae Totius Enchirifion Septem Libris Universam Recte Mectendi Rationem Comnpectus***.**

1669**—Durston**. According to Letterman and Schurter (1974), Durston made a 7-cm length incision for the application of caustic, in a patient with hypertrophic breasts. After the death of this patient, he resected her left breast for examination, which may have generated the hypothesis that he was the first surgeon to carry out a partial amputation of the breast.

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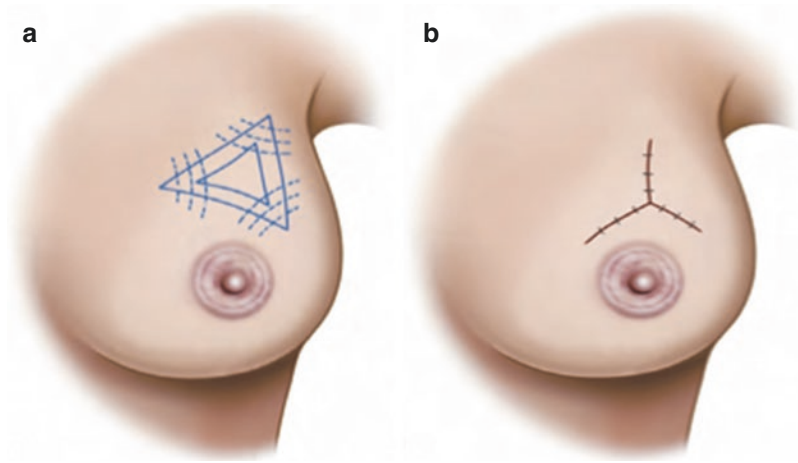

Fig. 6.1 Verchêre—1898

1669—**Durston.** Concerning a very sudden and excessive swelling of a woman's breast.

1847—**Paulus.** The seven books of Paulus A. Translated from the Greek by Francis Adams, London Sydenham Society.

1848—**Dieffenbach. R**eported that he had been performing breast reduction by making an incision in the inframammary crease.

1852—**Paul.** Total absence of the left mammary gland.

1854—**Velpeau.** Published work about breast disease in which he also addressed the problem of breast ptosis.

1882—**Gaillard and Thomas.** A surgeon from New York, who described an incision at the inframammary crease level used for excision of benign tumors and through which the breast was raised, fixing it in the cartilage of the second rib.

1886—**Hutchinson.** Congenital absence of hair and mammary glands.

1888—**Batchelor.** Absence of mammae in a woman.

1891—**Williams.** Polymastia with special reference to mammae erraticae and development of neoplasms for supernumerary mammary structures.

1893—**Basch and Thorek.** Undertook combined mammoplasty surgery with the abdominal wall.

1895—**Czerny.** Reconstituted with a lipoma removed from the thigh of a patient a breast that had undergone excision of a benign tumor.

1897—**Michel and Pousson.** Described a technique consisting in a semi-conic excision of the proximal part of the breast, through two concave incisions, from the skin to the aponeurosis, of the chest, which was fixed to the breast using catgut.

1898—**Verchêre.** Performed triangular excision on the superolateral aspect of the breast, including skin, fat layer, and mammary gland (Fig. 6.1).

1903—**Morestin.** Described removing a small benign breast tumor by making an incision at the level of the axilla. Some believe that in 1909, Morestin had already used the grafting technique between the papilla and areola.

1903—**Guinard.** Presented a technique that consisted in the conical excision of adipose and glandular tissue of the dorsum of the breast, with aponeurosis of the pectoralis major muscle, using a semicircular incision at the level of the inframammary crease.

1907a, b—**Morestin.** Reported the excision technique used since 1905 that is similar to a shaped disk of the dorsal part of the mammary gland with the aponeurosis of the pectoralis major muscle through an incision at the level of the inframammary crease. Because of its resemblance to the Guinard's technique, Joseph called this type of surgery Morestin-Guinard's technique (Fig. 6.2).

1907—**Hubert.** Published *Etude sur l'amastic. Thèse pour le doctorate médecine*.

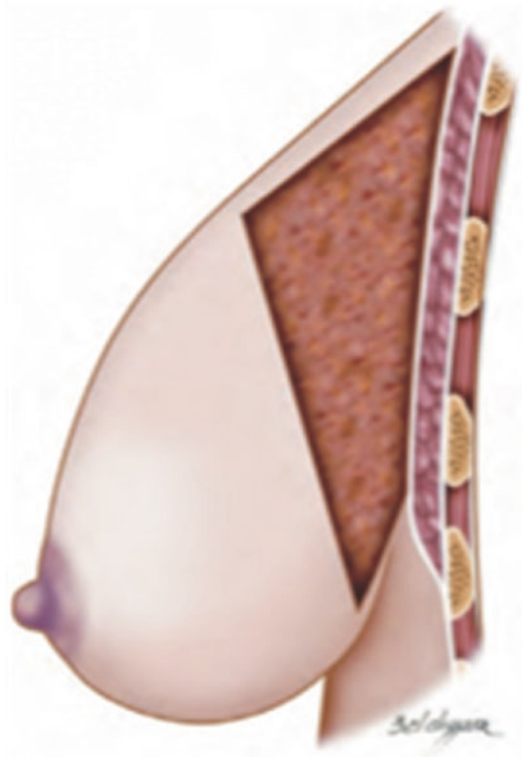

Fig. 6.2 Morestin and Guinard—1907

1907—**Warren.** Presented radial resection of the gland in relation to the papillary wedge from the chest to the aponeurosis to subcutaneous tissue, followed by fixation of the gland to the pectoralis fascia. He used this technique for excision of benign tumors with access via the inframammary crease.

1908—**Dehner.** Described the technique that consists of fusiform excision of the proximal part of the breast and its fixation on the periosteum of the third rib.

1910—**Girard.** Described surgery identical to that of Guinard, but added fixation of the breast to the cartilage of the second rib.

1911—**Villandre (Sinder 2003).** Reported mammoplasty with transposition of the nipple and areola by a cutaneous opening consisting in the original location of these elements.

1912—**Lexer.** In addition to the transposition of the nipple and areola, reduction of the breast was performed reduction, excising tissue from the distal pole, without skin undermining. He left peri- and infra-areolar scars shaped like an inverted T, with the transverse line at the level of the inframammary crease. From the historical point of view, perhaps this is the most important breast reduction technique, being the precursor of modern mammaplasties, which differ mainly by not performing Schwarzmann's maneuver. According to Maliniac and Thomas Rees, Lexer also carried out partial excision of the breast with grafting of the nipple and areola (Fig. 6.3).

1912—**Holländer.** Published a book about cosmetic surgery.

1913—**Simpson.** Published a case of amastia.

1914—**Göbell.** Described the suspension of the breast using fascia lata strips attached to the third rib.

1916—**Dufourmentel.** Described transposition of the nipple and areola similar to Villandre's technique.

1916—**Kausch.** Performed excisions similar to a ring around the areola. He reported extensive necrosis in the left breast operated on in one stage. He operated on the right breast in two stages, without necrosis.

1917—**Deaver, McFarland.** *The breast: its anomalies, its diseases, and their treatment*.

1923—**Aubert.** Performed skin incisions with resection of rings of skin around the areola to reduce its size. Incision supra-areola with small inverted V in the center and the edges on the side limits and the medial inframammary crease. Undermining and excision of skin between this incision and the inframammary crease (except the nipple and areola). Excision of the glandular tissue on the distal base and suture of the gland, giving the conical shape. Transposition of the nipple and areola and suturing of the skin. The final peri-areolar and infra-areolar scar was shaped like an inverted T.

1923—**Passot (Sinder 2003).** Performed a half-moon excision of the skin with nipple–areolar transposition similar to Villandre's technique.

1923—**Kraske.** Described and disclosed Lexer's technique, as he was trained by him, and it became known as Lexer–Kraske's technique.

1923—**Lotsch.** Made circular incisions around the areola and vertical fusiform excision

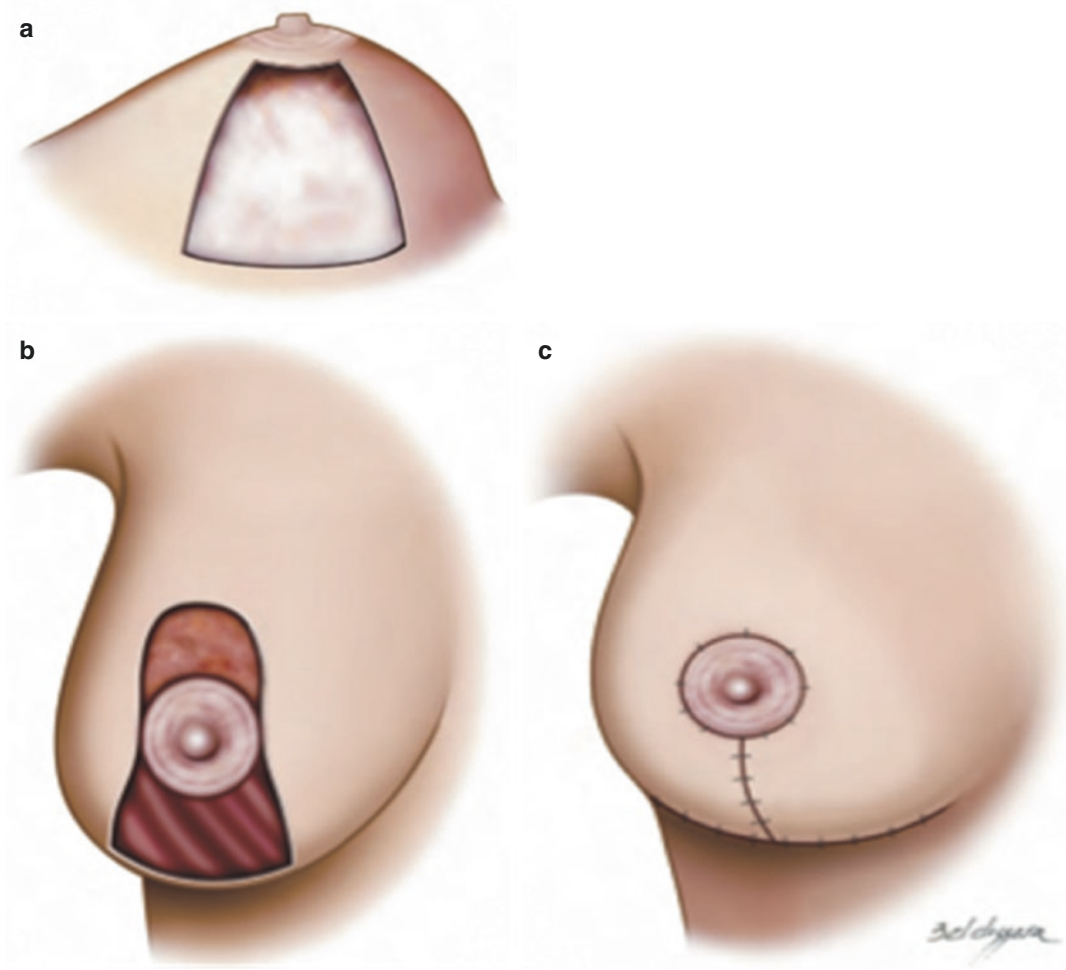

Fig. 6.3 Lexer—1912

between the areola and the inframammary crease. Also, the nipple and areola were transposed into their new positions, by making a circular skin excision. The final scars were peri-areolar and vertical infra-areolar.

1924—**Holländer.** Performed excision of the inferolateral part of the breast to the fascia of the pectoralis major and resection of the supra-areolar skin. Suturing by planes, leaving L or J-shaped scars or point with an oblique branch of the areola to the inframammary crease and another branch at the level of this inferolateral groove (Fig. 6.4).

1924—**Dartigues.** Described suspension and mastopexy techniques via the axilla.

1925—**Dufourmentel.** Performed transposition of the NAC and distal excision of excess tissue, similar to Villandre's and Passot's techniques.

1925—**Joseph.** Published his mammoplasty method in two phases, which has been used since 1922. Transplantation of the NAC through a pedicle flap with the distal level of the inframammary crease and excisions in the distal pole of the breast. In a second operation, about 1 month later, excision of the pedicle of the flap of the areola and final revision of scars.

1925—**Passot**. Performed aesthetic correction of the ptotic breast through transposition of the nipple.

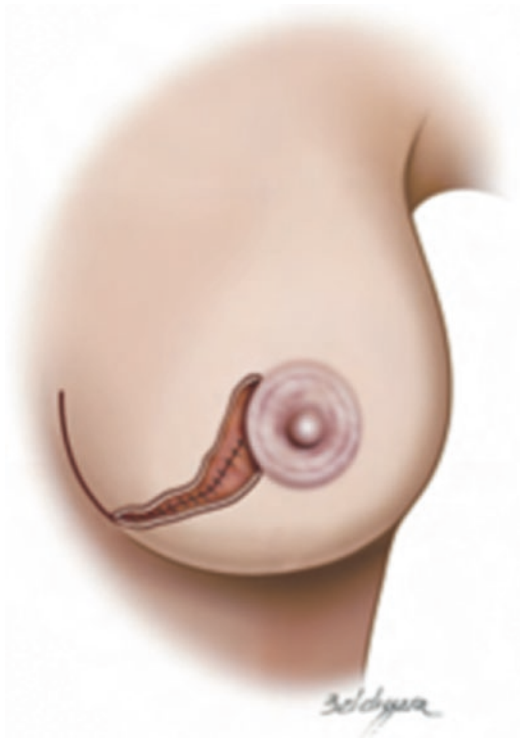

Fig. 6.4 Holländer—1924

1925—**Adair and Bagg.** Reported breast stasis to be the cause of mammary cancer.

1926—**Axhausen.** Performed peri-areolar resection of the skin through a ring and above this, made a curved incision with proximal concavity and almost complete undermining of the skin. Also, he carried out excision of the excess skin between the supra-areolar incision and the inframammary crease, and transposition of the NAC. Finally, he sutured the peri-areolar skin and inframammary crease.

1926—**Mornard.** Performed peri-areolar skin excision and on the inframammary crease, and detachment of the skin and partial excision of the gland wedge-shaped or infra-areolar "keel". He also carried out vertical and longitudinal suturing of the gland with transposition of the NAC, Followed by excision of excess skin and peri-areolar cutaneous and inframammary crease suturing.

1926—**De Quervain (Sinder 2003).** Performed skin incision just above the inframammary crease and detachment of the skin, together with excision of the peripheral gland, leaving the central part that remains attached to NAC. He also carried out gland fixation to the pectoralis fascia and cutaneous suturing on the inframammary crease.

1926—**Küster no. 1. (Sinder 2003).** Performed partial excision of the breast, with half-moon or lateral concavity.

1926—**Küster no. 2. (Sinder R. 2003).** Performed partial excision of the breast with a half-moon shaped approach with proximal concavity.

1926—**Weinhold.** Performed semicircular excisions above and below the NAC.

1927—**Cesari.** Performed breast surgery in ptotic breasts.

1928—**Joseph.** Described his mastopexy technique or suspension of the breast using the axillary method, that is, supra-areolar excision using an inverted U-shaped incision with suturing of the areola in the proximal-most position. Vertical incision was made at the level of the anterior axillary line and the breast lifted, making two "dog ears," which were excised and sutured by a "z-plasty."

1928—**Noël a.** Performed skin resection using half-moon incisions on the supra-areolar area two or three times until the desired position of the areola was achieved. Sometimes, infra-areolar excisions were also made to distribute the scar around the areola in a regular fashion.

1928—**Noël b** Circular skin excisions were made up to the NAC to achieve the desired position. Straight skin incisions were made to join the peri-areolar circular incision to another one on the inframammary crease. Skin was detached to provide resection of the distal part of the mammary gland and transposition of the NAC. Forceps were used to evaluate the amount of excess skin on the vertical segment to be removed. After the infra-areolar vertical suturing was done, the excess skin on the submammary crease was removed and the final scar was an inverted T (Fig. 6.5).

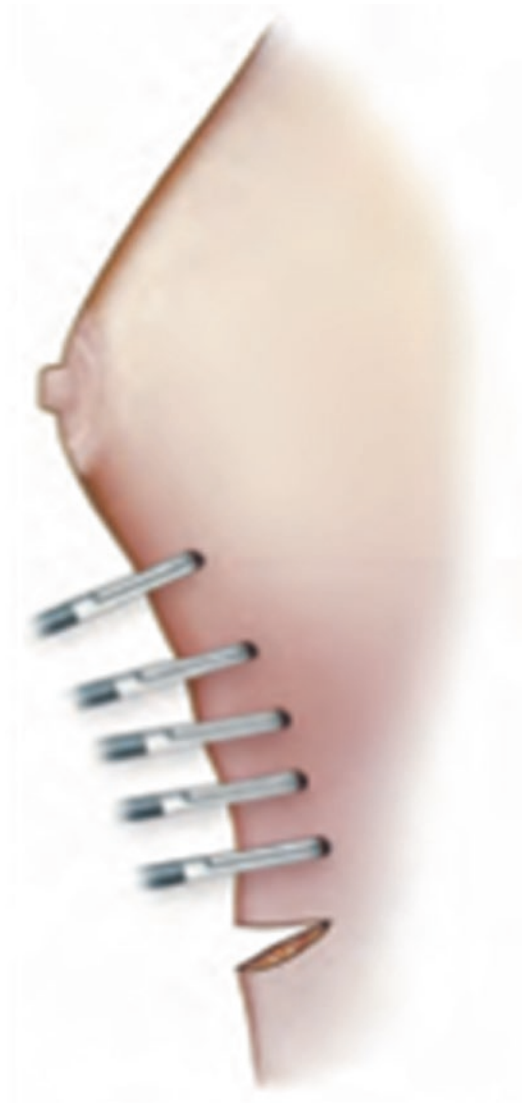

Fig. 6.5 Nöel—1928

1928—**Cesari, de Bolonha (Sinder R. 2003).** Checking the difference in length between the two half-moon incisions performed by Noël's first technique, he removed small triangles on the proximal segment of the wound to make it easy to suture.

1928—**Dartigues**. Performed vertical skin incision on the infra-areolar segment after detachment of the skin. Excision of excess fat and glandular tissues of the distal portion of the breast was carried out. With the use of a curved intestinal clamp, he demarcated the excess skin to be removed combined with fixation of the glandular tissue to the fascia of the pectoralis major muscle. He also made partial excision of the breast and nipple–areola graft using a special instrument to delimit the circular incision on the areola. In some cases, intra-areolar excisions were carried out without peri-areolar incision.

1928—**Lotsch no. 2**. Described his infra-areolar method using an anchor-shaped incision to undermine the skin to resect the excess adipose and glandular tissues and suture the skin leaving an inverted T scar.

1928—**Biesenberger**. Performed skin excision of the areola using a ring-shaped incision to reduce the diameter of the areola. Curve incision was done from the areola to the inframammary crease followed by wide detachment of the skin. Excision through an S-shaped incision of the lateral and distal portions of the gland and adipose tissue was carried out. Rotation in the lateral and cranial direction of the remaining glandular tissue (with the nipple and areola) and its fixation with simple stitches, giving the breast a conical shape. Delimitation and excision of excess skin (vertical and horizontal) with suturing of the skin leaving at the end a peri-areolar and inverted T.

1928—**Dufourmentel L.** Performed an areolar incision for breast surgery.

1929—**Virengue (Sinder 2003).** He published a book *Le Sein* (*The breast*) on cosmetic breast surgery in which he described a technique similar to Thorek's (reduction mammoplasty with graft of the nipple and areola). He used local anesthesia with adrenaline and placed drains that were removed on the third or fourth day after surgery. He used to perform surgery in one go in cases of ptosis and moderate hypertrophy, and a two-stage operation for gigantomastia that he called "localized or generalized fat degeneration."

1929—**Schreiber (Sinder 2003).** Performed mammoplasty in two stages: in the first, a skin excision was made through an inverted U-shaped incision between the areola and its future position; also, with partial resection of the supra-areolar gland and fixing to the fascia of the pectoralis major. In the second stage, he performed excision of the skin on the vertical segment between the areola and the submammary

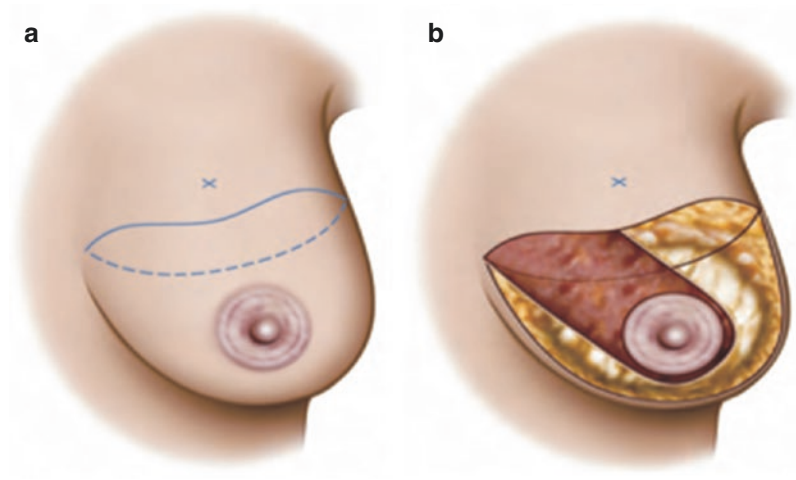

Fig. 6.6 Schwarzmann —1930

fold; glandular resection was carried out, forming a wedge below the areola with the vertical suturing of the gland and the final scar was an inverted T on the infra-areolar area.

1930—**Schwarzmann**. Resected the distal and lateral parts of the breast and the NAC was transposed by a de-epithelialized dermal–adipose–glandular flap with a superior and medial pedicle. The peri-areolar de-epithelialized procedure became a classic one and bears his name, Schwarzmann's maneuver (Fig. 6.6).

1930—**Glässmer.** Performed skin resection just above the areola and lateral transposition of the nipple and areola. The final scar was transverse, lateral, proximal and peri-areolar.

1931—**Kurtzahn.** Performed vertical mammoplasty: detachment and skin excision around and below the areola in a J-, comma- or L-shaped scar.

1931—**Passot.** Published a book: *La chirurgie esthétique pure* (*Pure cosmetic surgery*).

1931—**Lexer.** Published a book: *Die gesamte Wiederherstellung Chirurgie* (*The entire reconstructive surgery*).

1932—**Eitner.** Employed two techniques: first, to correct small breast ptosis in one go (skin excision above the areola in the inverted U-shaped incision and transposition of the nipple and areola). The second in two stages for gigantomastia correction. The first stage of the second technique consisted of a supra-areolar incision, undermining of the skin, a wedge resection of the superomedial part of the gland and fixation to the fascia of the pectoralis major muscle; supra-areolar excision of excess skin, and transposition of the papilla and areola. In the second stage, he made a wedge-shaped excision of the breast of the distal portion and vertical sub-areolar suture. It is mentioned that in 1935, he used to perform breast reduction using peri-areolar incision.

1933—**Nissen (Sinder 2003).** Mastoplasty was performed in two stages. In the first stage: a peri-areolar and transverse incision on each side of the areola; cutaneous detachment; wedge-shaped glandular excision in the superomedial area of the breast; and transposition of the nipple and areola. In the second stage (15 days later): excision of the distal part of the breast; suturing at the level of the inframammary crease.

1935**. Ehrenfeld (Sinder 2003).** Drew a line around the base of the breast with the aid of an apparatus called a "*mastômetro*": a segment directed downward to determine the radius of the circumference of the base of the breast and was used to mark the new position of the papilla. Marking the excision of the excess tissue by means of two curved lines whose lateral and medial ends joined in the submammary fold, such that the distal curved line, as in the U shaped incision, to delimit a flap with an areolar and dorsal pedicle, whose excessive skin was used to transpose the papilla and areola.

1936—**Prudente.** Published a book (*Contribution to Study of Plastic of the Breast—Aesthetic Surgery Breast*) in which he described several types of flaps to cover large wounds resulting from mastectomies and various reduction mammaplasty techniques in one and two surgical stages, with scars in the inframammary crease, on the vertical and areola, leaving an inverted T-shaped scar. He employed vertical methods based on Kurtzahn's publication in 1931, with and without circumcision of the areola. In the method with an inverted T-shaped scar, which he considered the most complete, was a supra-areolar incision in the shape of a W opened with the medial branches and horizontal side, ending the incision at the level of the inframammary crease. He used a circular device, which he called "*haloniótomo*" to make the areolar incision.

1936—**Claqué I, Bernard.** They described about mammaplasty.

1938—**Nedkoff.** Marked the skin excisions by drawing a W above the areola with the medial and lateral branches slightly curved. Excision of all skin between this route and the inframammary crease (except for the NAC); adipose–glandular excision wedge-shaped distal base with transposition of the areola. Peri-areolar scar and inverted T-shaped scar.

1938—**Burian F.** Described his experience with mammaplasties

1939—**Claoué (Sinder 2003).** Published a book: *Breast Plastic Surgery* (*Plastique Mammaire*) in which he addressed several issues of mammoplasty and described in detail his personal technique and several surgeons such as Pousson, Dartigues, Noel, Glässmer, Guinard, Morestin, Girard, Dehner, Goebell, Aubert, Mornard, Dufourmentel, Villandre, Joseph, Hollander, Biesenberger, and Schwarzmann. Claoué developed a complex technique using multiple points, lines, and angles to measure the breast and chest on the horizontal, vertical, and oblique.

1939—**Gillies and McIndoe**. Elevated the operating table so that the patient stays in a semi-sitting position. The new position of the NAC was determined by the intersection of two circles with centers respectively at the sternal notch (15–19 cm in radius) and the base of the xiphoid process (such as 1.27 cm smaller radius than the former); with an interpapillary distance of approximately 23 cm. Schwarzmann's maneuver with bimanual stretching of the skin was performed. They used two methods to incise the skin and to resect any excess:

(1) Vertical incision above and infra-areolar, resulting in a final peri-areolar and infra-areolar inverted T-shaped scar.
(2) Transverse or horizontal supra-areolar incision, resulting in a final peri-areolar scar and the level of the inframammary crease. They carried out extensive skin displacement and used two methods of adipose–glandular excision: the Biesenberger technique, preserving the vascular superomedial pedicle; and a U-shaped incision above the areola and an infra-areolar, half-moon-shaped proximal concavity maintaining the two major vascular pedicles.

1942a, b—**Thorek.** Reported his technique of excision of the distal part of the breast and free graft of the nipple and areola he had already used some years before. According to Maliniac and Thomas Rees, this technique had already been used by Lexer (1912) and by Dartigues.

1942—**Nagel.** Verified histologically the presence of smooth muscle cells in the nipple graft, which would explain its contractility.

1942—**Prudente.** Worked on glandular regeneration in patients with chronic cystic fibrous mastopathy, undertaking partial amputation of the breast.

1943—**May.** Started surgery with the patient in the semi-sitting position. Peri-areolar incisions with Schwarzmann's maneuver. Also, he performed a straight supra-areolar incision up to the new position of the areola and infra-areola up to one third of the distance from the papilla to the inframammary crease, with wide skin undermining. After excision of the wedge-shaped gland and suturing, he then placed the patient in a horizontal position. Afterward, he re-adapted the skin on the

gland as a brassiere, temporarily covering the breast. He then evaluated and excised the excess skin using forceps. The final scar was peri-areolar and infra-areolar like an inverted Y-shape.

1943**—Maliniac.** Concerned with important arterial blood supply of the breast.

1944**—Adams.** First author to mention the importance of the conical shape of the breast for marking of the NAC on the top.

1945**—Gillies.** Published personal analyses after plastic surgery of the breast.

1945a, b**—Maliniac.** *La mamaplastic en deux temps en report avec la vascularization*.

1945a, b**—Maliniac.** Published two-stage mammaplasty in relation to the blood supply.

1946**—Ragnell.** In breasts with flaccidity, ptotic breasts, or those with or without moderate hypertrophy, he performed mammoplasty in one stage: superficial skin peri-areolar resection with wide cutaneous undermining and glandular resection on a supra- and infra-areolar wedge-shape with suturing of the gland to the fascia of the pectoralis major muscle. The excess skin was resected and sutured, resulting in peri-areolar and infra-areolar scarring with an inverted T shape. In large hypertrophy, he performed mammoplasty in two stages. First, he carried out a large-scale detachment of the skin, a glandular excision above the areola with a wedge-shaped resection and suturing, resulting in peri-areolar scarring and on the inframammary crease. In the second stage, he made an incision in the inframammary crease and carried out skin detachment, glandular excision through a half-moon shape on the distal part as a wedge-shaped resection, and the excess skin was excised with suturing in the inframammary crease.

1946**—Thorek.** Published important considerations about breast reconstruction with free transplantation of the nipple.

1947**—Adams.** Performed a free compound graft of the nipple in mammoplasty.

1948**—Maliniac.** Carried out a comparative study of the amputation methods with nipple–areola grafting and transposition. He used to prefer the transposition method; however, in gigantomastia, he indicated amputation with a nipple–areola graft. He presented an important anatomical study of the vascularization of the breast, especially on the plexus supplying the NAC. He gave credit to Dartigues for the pioneering amputation method with the nipple–areola graft.

1948**—Viegas.** Published a case of amastia.

1949**—Adams.** First author to perform transplantation of the genital labia as a graft for nipple correction.

1949**—Aufricht.** Presented a geometric method of tracing incisions in breast surgery. He showed the relationship between the infra-areolar excision with a wedge-shape and the height of the mammary cone. Also, he reported the use of long temporary stitches on the skin of the sternal notch and at the level of the xyphoid process to transfer from one side to another of the symmetrical points of the skin marking. He performed glandular resection excisions above the areola, and, like most of the surgeons of that time, he used to carry out extensive skin detachment.

1949**—Bames.** After extensive skin detachment, he excised the inferolateral part and sometimes also inferomedial part of the gland and excess skin, and with transposition of the NAC. In patients with gigantomastia, however, he preferred amputation with a nipple–areola graft. His final scar was peri-areolar and infra-areolar with an inverted T shape.

1949a, b**—Maliniac.** Published an article about the indication for and basic care of mammaplasties. He preferred to carry out reduction mammaplasty with transposition of the NAC in one or two stages, according to the degree of hypertrophy. In gigantomastia, he performed a nipple–areolar graft. He stressed the advantages of glandular excision at the base of the breast close to the aponeurosis of the pectoralis major muscle by incision into the inframammary crease.

1949**—Harris.** Published a description of a peri-areolar mammaplasty.

1949a, b**—Maliniac.** Published an important evaluation of the surgical principles of mammaplasty.

1950**—Harris.** Presented valuable considerations of the status of plastic surgery of the breast.

1950a, b**—Maliniac.** Published the book *Breast Deformities and Their Repairs*. He has written numerous articles related to breast plastic surgery, such as a study of arterial vascularization in 1943; a critical analysis of mammectomy and nipple and areola graft in 1944; mammoplasty in two stages and breast vascularity in 1945; he also made a comparative study of transposition and nipple–areolar graft in mammoplasty in 1943; the evolution of the main techniques of mammoplasty in 1949; and the use of a de-epithelialized dermal-adipose flap in mammoplasty in 1953. In the latter technique, he resected the mammary gland and de-epithelialized the skin infra-areolar, forming a flap with the distal pedicle in the inframammary crease, which was used as "refilling" behind of the supra-areolar flap with a NAC graft. In 1959, he presented a paper on poor results in mammoplasty.

1950**—Hanrahan.** Performed wide detachment of the skin, with adipose–glandular excision supra-areolar, similar to a wedge shape with transposition of the NAC. On excising the excess skin, he used to leave a triangular flap with a distal base to the inframammary crease to decrease the tension at the union of the vertical and horizontal sutures.

1950**—Skoog.** Published a description of a new surgical instrument to be used in mammaplasty.

1950**—Spina.** Performed neo-areoloplasty with labial transplant.

1951**—Fernandez.** With a ruler placed between the breast and thorax, to mark the new location of the NAC to the level of the inframammary crease at the hemi-mammary line. He used to carry out bidigital clamping to evaluate the excess skin to be excised, similar to a lozenge-shape between the inframammary crease and this new position, with transposition of the NAC.

1951**—Tamerin.** Performed a wedge-shaped excision with its vertex at the center of the nipple and based on the inframammary crease, including a distal triangular flap of the nipple and areola. Excision of the two "dog ear," which were formed on each side of the base, resulting in a final scar with an inverted T shape.

1951**—Thale.** Presented a paper on the complications of mastoplasty, paying special attention to nipple–areolar necrosis and reconstruction with a small genital lip graft.

1951**—Malbec.** Published an important review of mammaplasty.

1952**—Conway.** Presented his experience in 110 consecutive cases of mammaplasty, 68 of which by amputation with nipple–areolar graft, which was the method of choice. He concluded that, in most cases, there was recovery of contractility and sensitivity of the NAC graft.

1952**—Gillet.** Suspension and support of the mammary gland through a network of nylon threads anchored in the collarbone.

1953**—Maliniac.** Published his technique on subcutaneous excision of the mammary gland and use of a dermal–adipose de-epithelialized flap with a distal pedicle at the level of the inframammary crease, used to "refill" the breast, with a NAC graft (Fig. 6.7).

1953**—Malbec (Sinder 2003).** Performed mammoplasty in two stages. He carried out the second stage about 45 days afterward. In the first

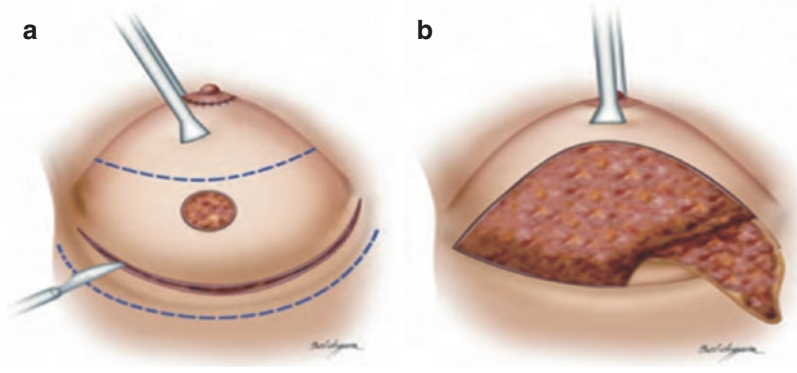

Fig. 6.7 Maliniac—1953

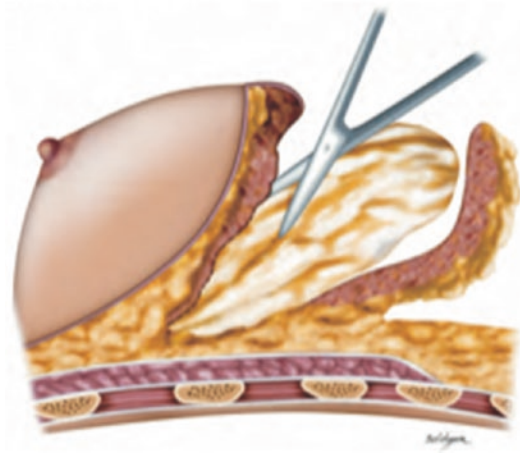

Fig. 6.8 Longacre—1954

stage, he excised a segment of the supra-areola and positioned the NAC. In the second stage, he dealt with excess of skin and modeling of the breast.

1953—**Gilliles, Marino.** Published "periwinkle shell" principles in the treatment of the small ptotic breast.

1954—**Longacre.** Presented a technique for the correction of hypoplastic breasts, utilizing a dermal-adipose de-epithelialized flap, with a half-moon shape, which was introduced under the gland to increase the volume of the breast. He carried out undermining of the dermal-adipose segment allowing a submammary skin advancement flap to close the donor area, resulting in a scar in the submammary crease (Fig. 6.8).

1955—**Erczy.** Performed mammoplasty in two stages, with a 6-week interval. In the first stage, he carried out extensive undermining of the skin with excision of the glandular tissue supra-areolar with suturing and fixation to the pectoralis major muscle, and transposition of the nipple and areola. In the second stage, he used to perform infra-areolar excision, including skin, fat, and glandular tissue, for modeling and final suturing peri-areolar and infra-areolar with an inverted T-shaped scar.

1955—**Jack Penn.** He published the technique called "Jack Penn #1": infra-areolar excision in a wedge-shape, with transposition of the nipple–areolar complex. He used to suture the infra-areolar and vertical wound to the inframammary crease, which decreased the distance from the areola to the submammary fold; the two "dog ears" were resected on the submammary fold. The final scars were peri-areolar and infra-areolar with an inverted T shape.

1955—**Ragnell.** Analyzed over a 1,000 cases operated on using the method of the proximal double vascular NAC pedicle, described in 1946: wide detachment of the skin, with adipose–glandular excision supra- and infra-areolar, modeling of the breast, with suturing of the skin. He used to carry out gigantomastia in two stages. Good lactation capacity was reported in most patients who became pregnant after surgery.

1955—**Guillera.** Published the book: *Breast Disease*.

1956—**Longacre.** Based on his technique published in 1954 for the treatment of hypoplastic breast, the author modified this, adapting it to flaccid and discoid breast correction, making a de-epithelialized dermal–adipose flap with a half-moon shape with a proximal infra-areolar pedicle. This flap was folded back and up with its lateral and medial extremities united behind and above the areola with the pectoralis major, projecting the NAC and improving the conical shape of the breast.

1956—**O'Connor and Watron (Sinder 2003).** Published a wide review of the mastoplasty techniques most frequently used in the previous 10 years and a summary of the care that was considered fundamental in these surgeries.

1956—**May.** He performed a wide detachment of the skin, adipose–glandular excision in the superolateral quadrant, skin rehabilitation with the help of a brassiere temporarily covering the papilla and areola, excision of the excess skin with the aid of forceps, leaving a lower triangular flap based on the inframammary crease and the top 2.5 cm from the center of the crease. In gigantomastia, he preferred amputation with a nipple and areolar graft.

1956—**Wise.** Published a mammoplasty technique employing a plastic ring to enclose the periphery of the base of the breast and latex molds to draw the skin incisions. Assessed resection with the aid of a model, also made of plastic.

The molds were based on the shape and volume of normal breasts and a good aesthetic standard.

1957—**Adams.** Performed a free transplant of the NAC in mammoplasty.

1957—**Marino, Uriburu.** Published the book: *The Breast*.

1957—**Ragnell.** Further experience of the preservation of the capacity for lactation and nipple sensitivity after breast reduction.

1957—**Arié.** Published a technique for the correction of hypertrophy and ptotic breast: Schwarzmann's maneuver, infra-areolar excision in a wedge-shape and transposition of the NAC. He did not perform any cutaneous undermining and obtained great dissemination and acceptance owing to the simplicity of the procedure. It represented an important contribution to modern mammoplasty, especially in Brazil.

1957—**Malbec.** Stressed the importance of suturing the mammary gland to the musculoaponeurotic plain because, in his view, the skin does not serve to support the breast, but merely to wrap it.

1957—**Gillies H, Millard Jr.** Published an remarkable book: *Principle and Art of Plastic Surgery*.

1957—**Malbec**. Described important aspects of mammaplasties.

1958—**Gillies and Marino.** In ptosis, small breasts underwent extensive skin detachment, rotating the side portion of the gland on the proximal portion so as to increase the volume of the cranial pole and readaptation of the skin. This technique, based on Biesenberger's method was called the periwinkle shell principle or the snail technique.

1958—**Marino.** Described important considerations regarding mammaplasties.

1958—**Conway, Smith.** Analyzed 245 cases for: reduction mammaplasty, mastopexy, augmentation mammaplasty, and mammary construction.

1958a, b—**Bames.** Described reduction mammaplasty performed in two operative stages.

1958a, b—**Bames.** Described breast reduction in major hypertrophy.

1958—**Mclndoe and Rees.** Also used the technique that Biesenberger modified.

1958—**Malbec.** Reported on postoperative complications after mammaplasties.

1959—**Maliniac.** Presented important considerations: harmful fallacies in mammoplasty.

1959—**Pitanguy.** Presented an analysis of 120 cases of breast lift operated by several techniques, depending on the type of breast, giving preference to nipple–areola transposition methods. Underlines the good results obtained with Arié's technique, especially in small ptosis and hypertrophy, adding significant changes in surgical principles that gave a huge boost to reduction mammaplasty.

1960—**Strömbeck.** Planned the incisions on the skin with the aid of a mold similar to that described by Wise; Schwarzmann's maneuver; dermal–adipose–glandular excision infra-areolar and a supra-areolar cylinder to facilitate the transposition of the NAC, which has two pedicles: one superomedial and the other superolateral. The skin was not detached.

1960—**Penn.** Published breast reduction II.

1960—**Fomon**. Published: *Cosmetic Surgery. Principles and Practice*.

1961a, b—**Pitanguy.** Described his personal technique and important aspects of a study of 245 consecutives cases of mammaplasty (Fig. 6.9).

1961a, b—**Pitanguy.** Described an eclectic approach to the problems of mammaplasties.

1961—**Dufourmentel and Mouly**. Schwarzmann's maneuver; skin and fat–glandular excision in the laterodistal portion of the breast, resulting in peri-areolar and infra-areolar scarring, the latter angled, from the distal-most part of the areola to the lateral end of the inframammary crease.

1961a, b—**Pitanguy.** Presented a mammoplasty technique with dermal–adipose–glandular excision infra-areolar after Schwarzmann's maneuver, without undermining of the skin. The evaluation and marking of the portion to be excised were made individually on each breast of each patient and depended on several factors, such as volume, skin elasticity, and consistency

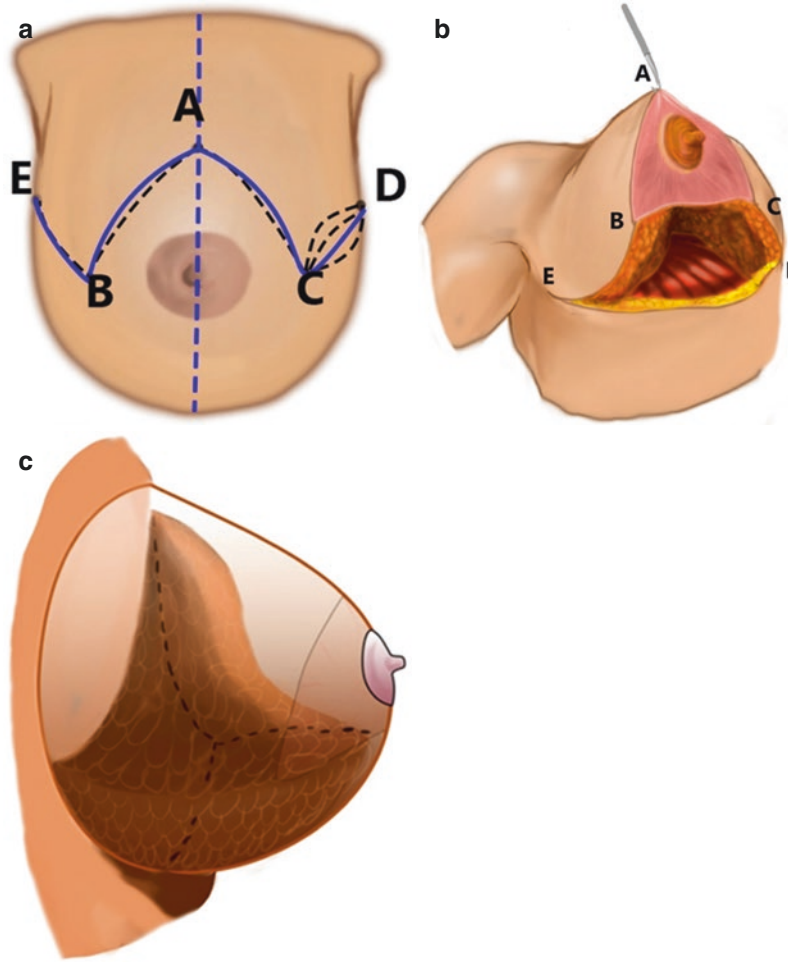

Fig. 6.9 Pitanguy—1961a, b

of the gland. The NAC was positioned in the apex of the cone obtained after mastopexy of the breast tissue. It had indications for various types of breast ptosis and hypertrophy and is one of the most frequently used techniques in recent years by many surgeons. Pitanguy was author of a book and several publications on mammaplasty. The details of his technique, with or without modification, have been the basis for numerous current methods of mammaplasty, in the endless pursuit of surgical improvement.

1962a, b**—Pitanguy.** Published a new technique for mammaplasty.

1962a, b**—Pitanguy.** Carried out an extensive histopathological study of the breast tissue removed during mammaplasties.

1963**—Cronin and Gerow.** Published augmentation mammaplasty: a new "natural feel" prosthesis.

1963**—Da Silva.** Presented a geometric method to make the planning of the incisions, using as a basic measure the distance from the papilla to the inframammary crease of a woman with normal breasts (8 cm). His method can be used with transposition of the nipple and areola or even for a nipple–areola graft.

1963**—Marino.** Made interesting comments on the new trends in breast reduction. He gave

preference to techniques that respect the early embryological relationship between the coating skin and the glandular tissue, to avoid or reduce to a minimum of detachment of the skin and moreover, maintaining full vascularization of the NAC. Within these principles, he made special reference to Jack Penn's technique #1, in addition to Arié's, Strömbeck's, and Pitanguy's techniques, which resembled Lexer's technique, considering them safer. Also, Dufourmentel and Mouly's method, in which an inferolateral excision, reminiscent of Hollander's technique, was executed, made a great impression upon him.

1963**—Robertson.** Described mammoplasty by a dermal–adipose–glandular excision between two incisions: one above and one below the areola, both curves. The NAC was grafted. The skin suture was made around the areola and a horizontal line on each of its sides.

1963**—Skoog.** Presented a mammoplasty technique with transposition of the nipple and areola, through a de-epithelialized flap with a superolateral pedicle (Fig. 6.10).

1963**—Tamerin.** Stressed the importance of the technique used by Lexer in 1912 and published by Kraske in 1923—"Lexer—Kraske technique"—and he considers one of the best. Made suggestions and personal technical details for their implementation.

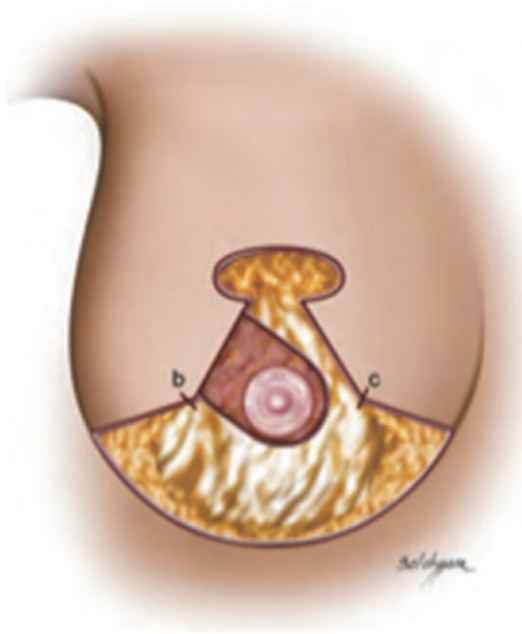

Fig. 6.10 Skoog—1963

1963a, b**—Pitanguy.** Contributed to the free graft technique for the correction of large breast hypertrophy.

1963a, b**—Pitanguy.** Contributed to the technique of mammaplasties.

1963**—Wise, Gannon, and Hill.** Reported good results with the technique presented by the senior author in 1956, performing transposition of the NAC. Basically, using the same technique, a pattern to trace the skin incisions, plastic rings to enclose the periphery of the base of the breast, which may also the graft NAC in gigantomastia, and studies related to the use of same technique in two stages in young patients.

1963**—Dufourmentel.** Performed mammaplasty using a lateral method.

1963**—Elbaz.** Published a useful thesis about the treatment of hypertrophic breast with or without ptosis using the "external oblique" method.

1964a, b**—Da Silva.** Presented mammoplasty technique of mastopexy: de- epithelialized skin to be spliced, which, in the form of a dermal tape, was used to lift the breast, fixing it to the pectoralis major muscle.

1964a, b**—Strömbeck.** Performed mammaplasty in hypertrophy of the female breast.

1964a, b**—Strömbeck.** Performed reduction mammaplasty. *Modern Trends in Plastic Surgery*.

1964**—Crickelair, Richey, Symonds.** Carried out histological studies of the female breast before and after nipple transplant.

1965**—Farina.** Published an article: *Plastic and Reconstructive Surgery*.

1965**—Dufourmentel, Mouly.** Developed the latero-oblique method.

1966**—Zilbsky.** Published a mammoplasty technique for cases of benign disorders such as cystic mastitis and fibroadenomas. In a first stage, a gland excision was carried out using the modified Strömbeck technique, leaving a supra-areolar vertical pedicle of denuded skin, so that the NAC had three pedicles, one at the top and two on the sides; infra-areolar skin was denuded, also forming a bifurcated flap based on the infra-mammary crease, as in the Longacre technique for discoid breast, in that the ends were sutured

behind the NAC to serve as fullness. In a second stage, silicone inclusion was performed.

1966a, b, c**—Pitanguy.** Published a new approach: transareolar incision for gynecomastia.

1966a, b, c**—Pitanguy.** Made a critical study of his personal technique for breast hypertrophy.

1966**—Pitanguy, Franco.** Published on the agenesis of the pectoral muscle associated with deformity of the hand (syndactyly and ectrodactyly).

1966**—Dufourmentel, Mouly.** Performed mammaplasty using the lateral method: reconstructive surgery of thermal injuries and other subjects.

1967**—Clarkson and Jeffs.** Carried out a study on various methods of mammoplasty, stressing the mainly good results obtained with use of the Strömbeck technique, which was considered to be among the best for correction of breast hypertrophy. In cases of gigantomastia he prefers amputation with a graft of the NAC.

1967**—Beare.** Performed reduction mammaplasty.

1967**—Pitanguy, Franco.** Reported on hypomastia and its surgical treatment.

1967**—Pitanguy.** Reported on surgical treatment of breast hypertrophy.

1967**—Kohn.** Performed cross-excision of the skin and adipose tissue in the glandular form of two trapezoids, one on each side of the areola, with the smaller base adjacent to it. The skin of the distal part of the breast was completely denuded, forming a dermal–adipose–glandular flap composed of a posterodistal pedicle with the NAC at its proximal end. The de-epithelialized flap was covered by the above-mentioned areolar flap, which was a circular opening to receive the NAC. The surgery results in a peri-areolar and submammary scar, as in Passot's technique.

1967**—Burian.** Performed a de-epithelialized dermal–adipose flap in a half-moon proximal concavity whose cranial margin corresponded to the inframammary crease; its central part, not removed, was the posterosuperior pedicle. He raised the medial and lateral parts and fixed them to the fascia of the pectoralis major muscle behind the gland, increasing the volume of the breast. Skin and subcutaneous adipose tissue distal to this flap were hipsters and advanced by sliding to close the donor area, which created fullness for the retro-areolar defect, improving or restoring the conical shape of the breast and designing the NAC. Some believe that Burian had used this technique since 1931.

1967**—Mathews.** Published a technique in which the planning of skin incisions and the volume to be excised was based on a path that takes into account not only fixed points, such as the sternal notch, xiphoid process, and midclavicular line, but also skin elasticity, the volume and the consistency of the breast. Excision was made after extensive skin detachment, achieving a NAC with two proximal pedicles, as in techniques already published by Gilles and Mclndoe in 1939 Maliniac in 1945 and Ragnell in 1946.

1967**—Pesková.** Presented a technique in which a NAC graft was made after gland excision of the skin and fat; scarification of the ends of two sub-areal flaps with a proximal pedicle and a circle in the new position of the areola to receive the NAC graft. The denuded portion of the subareal flaps was used as the "stuffing" of the breast.

1967**—Robertson.** Performed the inferior flap mammaplasty technique.

1968**—Dufourmentel and Mouly.** Used a breast ptosis correction technique based on the method proposed by Barnes in 1950: spin the inferolateral part of the gland upward and inward, also called *operation colimaçon* in French and in English periwinkle shell based on Biesenberger's technique. Among other changes, minimal detachment of the skin was made, the inferolateral part of the gland was introduced behind its proximal part, and the lower skin of the breast inferolateral was excised, so that the resulting scar directed the areola downward and out, like an L, a J, or a comma.

1968**—Berry.** Carried out geometric planning in reduction mammaplasty.

1968**—Rees, Dupeurs.** Treated unilateral mammary hypoplasia.

1968**—Myr y Myr.** Presented a study on breast lift, stressing the causes of poor results in the late postoperative period. Complaints, in most cases, were caused by the rise of the NAC with an increase in the distal pole of the breast as if it executed one folding movement; loss of the

single cone shape of the breast, and asymmetries and extended medial or hypertrophic scars. He usually used Biesenberger's technique modified by Mclndoe; however, instead of the infra-areolar inverted T-shaped scar, a side concave curve leaves scarring in a U or J shape.

1968**—Pastoriza.** Made an extensive comparative study of various mammoplasty techniques, taking into account the innervation and vascularization of the NAC, the shape and volume obtained after breast reduction, the resultant scars, and other factors. It was concluded that the maintenance of the results was conditioned by an appropriate reduction in the volume and sufficient excision of the skin, which should be sutured without undue stress; decreasing the function of the skin as breast support was advised, preferably using de-epithelialized skin flaps.

1969**—Mendes Filho and Lodovici.** In breast hypertrophy, removal of the gland as completely as possible was considered important. To create fullness in place of the gland, de-epithelialized skin flaps from the distal part of the breast were used, as in the technique published by Maliniac, 1953.

1969**—Goulian Jr, Gonway.** Reported correction of the moderate ptotic breast.

1969**—Lassus.** Mentioned the possibilities and limitations of plastic surgery on female silhouette.

1969**—Hoopes, Jabaley.** Made a comparison between reduction mammaplasty: amputation and augmentation.

1969 **and** 1972**—Hinderer.** Proposed in small ptotic and tubular breasts to excise one peri-areolar skin ring off the pectoral fascia in the distal part of the gland and make plication of the dermis and the gland below the areola.

1970**—Ramil Sinder.** Presented at the former National School of Medicine, at the current Federal University of Rio de Janeiro (UFRJ), a thesis on mammoplasty in which, in addition to a comprehensive literature review, he described how they treated medium and large hypertrophy. Usually, he used Pitanguy's modified technique. In large hypertrophies or gigantomastia, he carried out a true "emptying" of the fatty glandular breast, leaving the NAC at the distal end of a broad and thin de-epithelialized skin–fat flap of the proximal pedicle, in which a vertical supero-areolar incision was then made to transpose the NAC, in which it doubles over itself twice, first back and up and then back and down. Also, he made the flap behind and above the areola, with aponeurosis of the pectoralis major muscle, to provide more projection to the NAC. To join the vertical suture with the horizontal he used a triangular flap with a pedicle in the inframammary crease, resulting in a Y-shaped scar on the infra-areolar segment.

From 1972, he began to use a trapezoidal de-epithelialized flap based on the inframammary crease, whose height was identical to that from the groove to the areola after removal of excess tissue. Also, during the suturing of mammary tissue this flap was placed under the skin between the areola and the submammary groove. He inserted some stitches into the vertical infra-areolar skin and on the distal peri-areolar transfixing the dermal side and the proximal end of the flap respectively, leaving the distal pole of the breast supported by a subcutaneous dermal enhancement at the level of the anchor-shaped scar or inverted T-shaped scar. He performed that maneuver to decrease or to avoid flattening of the proximal segment and the distal pole bulging or folding movement, which may occur in the post-operative period. This flap was identical to the suprapubic one used in abdominoplasty described by the author, in which the surgery begins with an incision and undermining of the supraumbilical flap, followed by distal traction to assess the extent of infra-umbilical resection. From 1980, he began to use a similar flap in breast reconstruction with a myocutaneous transverse rectus abdominalis (TRAM) flap. From that year, when there was some difficulty in performing transposition of the NAC, the lateral portion of the supra-areolar flap became separated from the areola, as in the disclosure by Schwarzmann's maneuver (1930). A similar approach has been reported by Orlando and Guthrie (1975); Silveira Neto (1976), and Haben (1984), making it easier and safer to position the NAC by rotation of the superomedial flap. It was also possible to use the superolateral flap similar to that described by Skoog. If, despite the above-mentioned maneuvers, ischemia and/or cyanosis of the NAC were

found, this was carefully excised and used as a graft.

1970—**Craig, Skyes.** Investigated nipple sensitivity following reduction mammaplasty.

1970—**Sinder.** Thesis on mammaplasty presented and approved for Associate Professor at the former National Medical School (Faculdade Nacional de Medicina), the current Federal University of Rio de Janeiro (UFRJ).

1970—**Felix, Sethi, Ransdel, and Lissner.** Published a modification of Strömbeck's technique in which, instead of making transposing the NAC, they grafted it.

1970—**Arufe and Juri.** Presented modification of Strömbeck's technique. Instead of excising a cylinder or a cone of dermal–adipose–glandular supra-areolar tissue, they leave it fixed by its pedicle on depth. When they performed transposition of the NAC, the cylinder or cone was positioned behind the nipple and areola, to improve its projection and the conical shape of the breast. At the end of surgery, the distance from the areola to the inframammary crease should be about 4 cm. If it was greater, it was necessary to carry out de-epithelialization of the distal end of the flap, so that, when approximated in the areola, the vertical scar between them was 4 cm in length.

1970—**Souza.** Performed a wide review of techniques that employ supra-areolar incisions. He advised this type of approach in cases of ptosis in small breasts.

1971—**Pitanguy.** Described his personal technique for hypertrophic breast in a clinical study.

1971—**Goulian.** Published a technique for the correction of ptotic breasts.

1971—**Ress.** Reported an historical review of reduction mammaplasty.

1971—**Fisher, Smith.** Presented work on macromastia during puberty.

1971a, b—**Franco.** Published work on the heterotopic conservation of the nipple–areola segment for later implantation.

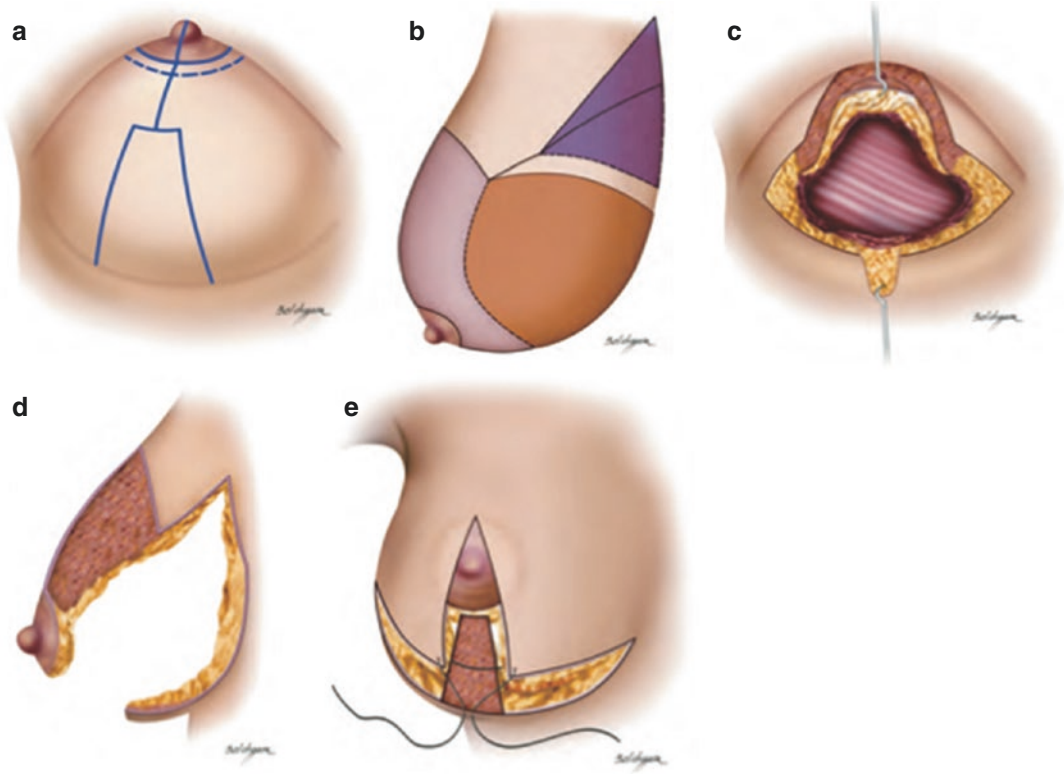

Fig. 6.11 Sinder—1972

1971—**Ship.** Described virginal and gravid mammary gigantism.

1972—**Ramil Sinder.** Presented a technique for treatment of gynecomastia using as access a Z-shaped incision within the limits of the areola. He also used this excision for access in benign tumor resections and to insert silicone into women's breasts. This technique extended the surgical field, facilitating hemostasis and avoiding scars outside of the areolar region (Fig. 6.11).

1972—**Lemos.** Presented personal communication for the improvement of breast surgery. Comunicação pessoal. I Congresso da ISAPS—Rio de Janeiro 1972. First Congress of the International Society for Aesthetic Plastic Surgery. Rio de Janeiro—January, 1972.

1972—**McKissock.** Published a breast reduction technique in which the NAC was in a de-epithelialized, bipedicled vertical flap. When nipple–areola transposition was carried out the flap folds in on itself, helping to increase the projection of the proximal pole, or supra-areola, when the mammary gland was sutured and afterward the skin.

1972—**Franco, Luz, Rebello.** Described mammaplasty by an incision into the upper pole of the breast.

1973—**Pontes.** Presented a personal technique in which surgical marking of the skin incisions was shaped like a W. After Schwarzmann's maneuver and skin incisions, he made a horizontal incision into the mammary gland 2 cm below the areola.

1973—**Weiner.** Published on transposing the NAC through a de-epithelialized flap with a proximal pedicle.

1973—**Pitanguy, Carreirão, Garcia.** Published on a transareolar incision for augmentation mammaplasty.

1973—**Farina.** Described breast hypertrophy treated by a mammoplasty with a free areola transplant.

1973—**Wexler, O'Neil.** Reported areolar sharing to reconstruct the absent nipple.

1974—**Letterman and Schurter.** Wrote an interesting article based on historical documents. They concluded that, contrary to what was found in many books, the first mammoplasty was not performed by Durston in 1669, but by Paulus Aegineta , a Byzantine physician who in the sixth century BC, described a technique for the surgical treatment of gynecomastia.

1974—**Gsell.** Published a technique of mastoplasty with transposition of the NAC for cases of gigantomastia. As in Strömbeck's technique, he made surgical marking for the skin incisions with the use of a modified Wise's mold.

1974—**Regnault.** Published a method called the b technique of breast reduction, because of the original layout of similar incisions to that letter of the alphabet. She did not perform cutaneous undermining, and the resulting scar was relatively small.

1974—**Meijer.** He presented a procedure that was based on Aufricht's modified technique, not only regarding the surgical marking for the skin incisions, but also the shape of the flaps, which resembles a pyramid with a proximal apex similar to the keel-shaped excision of Pitanguy's technique.

1974—**Aíache.** Based on the mastopexy technique that was presented by Lerner and Tittiranonda, at the First Congress of ISAPS in Rio de Janeiro in 1972. The mammaplasty technique was indicated for ptotic breasts and moderate hypertrophy. The surgical marking was a circle, to determine the future position of the areola, with two descending lines at the lateral and medial margins of the breast. Below the areola the two lines converged to a point in the inframammary crease, forming a proximal triangle at the distal edge of the areola.

1974a, b—**Sinder.** Employed a dermal–adipose flap on the reduction mastoplasty and in abdominoplasty (personal techniques).

1974—**Sperli.** Described a technique of reduction mastoplasty with functional preservation of the nipple.

1974—**Townsend.** Described nipple sensation following breast reduction and free nipple transplantation.

1975—**Parsons, Burton, and Shaw.** Published a paper stressing the importance of a pre-fabricated pattern presented by Wise in 1956 to demarcate the skin incisions for mastoplasty. This model was adopted or modified by other surgeons as Strömbeck, Weiner, McKissock, and Lewis.

1975—**Meyer and Kesselring.** Preferred to make an infero-lateral excision with de-epithelialization peri- and infra-areolar and with elevation of the inframammary crease. Surgical marking was done according to the size and

shape of the breast. The final scar was similar to an L or a J, reminiscent of Hollander's technique, which has been modified and improved by several authors such as Dufourmentel and Mouly, Elbaz and Verheecke.

1975—**Carlsen and Tershakowsec.** Made a circular incision of 5 cm in diameter around the NAC and Schwarzmann's maneuver followed by detachment from the skin with resection of fat and glandular tissue similar to the cone above the areola and a wedge-shape or a keel. The final scar was around the areola and it was a vertical one similar to an inverted T shape.

1975—**Andrews, Yshizuki, Martins, and Ramos.** In selected cases of small hypertrophy and breast ptosis, they exclusively used a peri-areolar approach through Schwarzmann's maneuver, skin undermining, glandular resection, and deep suture, modeling the gland.

1975—**Rudolph, Earle, and Fratianne.** Using the technique described by Dufourmentel and Mouly: they made an inferolateral excision with some personal modifications and refinements.

1975—**North.** Published an article about surgical correction of breasts that, after lactation, suffered a process of severe involution and ptosis. He employed Wise's model, similar to Strömbeck's technique. He did not carry out adipose-glandular resection, only de-epithelialization of the area limited by surgical marking for skin resection. The infra-areolar flap of dermal–adipose—glandular tissue was fixed between the mammary gland and the pectoralis major muscle, to improve the volume and projection of the breast.

1975—**Ribeiro.** Presented a technique of de-epithelialization of the skin between the submammary crease and a line joining the ends of the inframammary crease with the areola, which was shared with Schwarzmann's maneuver. The skin was incised with a proximal concave curved line connecting the ends of the inframammary crease and a circle around the areola above its proximal edge. Like the techniques of Passot and Kohn, only two scars were left on the skin: one peri-areolar and another in the inframammary crease**.**

1975—**Schatten, Hartly, and Crow.** Employed the technique published by Dufourmentel and Mouly, in 1961 and 1965, leaving an infra-areolar scar similar to an L or J shape. In some cases, it was necessary to perform wide glandular excision, de-epithelializing the NAC into a thin flap. In small and flabby breasts, instead of excising the infero-lateral portion, de-epithelialization was carried out and used as a composite dermal–adipose—glandular flap, which was introduced between the mammary gland and the pectoralis major muscle.

1975—**Herman, Hoffman, and Kahn.** Published an article about the sequelae of mastoplasty with unaesthetic scars with depigmentation, recurrence of ptosis or hypertrophy, asymmetry, changes in the shape, unaesthetic position inversion or loss of the papillae, and others. They investigated the causes and made suggestions for prophylaxis and treatment of these sequelae.

1975—**Orlando and Guthrie.** The surgical marking was done using the model described by Wise in 1956. Transposition of the NAC through a de-epithelialized flap with a supero-medial pedicle obtained by Schwarzmann's maneuver. An incision that extends from the side margin of the areola to the lateral limit of this new position was made. This flap with the areola maintains good vascularization.

1975—**Fischi, Kahn Simon.** Published on Mondor's disease: an unusual complication of mammaplasty.

1975—**Rees.** Described a useful method for reconstruction of the areola by tattooing.

1975—**Hartley JH, Schatten WE, Griffin M.** the authors described about redundancy of skin during subcutaneous mastectomy.

1976—**Rubin.** Wrote a chapter on the surgical treatment of the massive hypertrophic breast.

1976—**Silveira Neto.** Described a technique with transposition of the NAC through a de-epithelialized flap with a superomedial pedicle that was obtained by performing Schwarzmann's maneuver. A straight incision was made extending from the side edge of the areola to about 1 cm from point A. A lateral incision was made to facilitate the rotation of the areola up and out to its new position.

1976—**Jacques W, Silveira Neto J A.** they described a miomastopexy technique for mastoplasty.

1976—**Franco.** Made an incision in the small and ptotic breast, similar to a key-hole.

1976—**Horibe, Spina, and Lodovici.** Performed breast reduction with oblique lateral skin excision and infra-areolar glandular excision leaving a lateral scar.

1976—**Baroudi and Lewis.** Published an article in which they addressed surgical treatment for small and ptotic breasts. Skin excision with transposition of the areola associated with inclusion of a silastic implant, leaving the peri-areolar and infra-areolar scar as an inverted T shape.

1976—**Bartels et al.** Published a study on mammoplasty using a technique similar to that described by Andrews in 1975, excising a skin ring on the edge of the areola, leaving only a peri-areolar scar.

1976—**Goldwyn.** He published a book on mammoplasty, *Plastic and Reconstructive Surgery of the Breast*, with a large number of authors, about aesthetic and reconstructive surgery.

1976—**Jurado.** Carried out transposition of the NAC through a dermal–adipose–glandular de-epithelialized flap with the areola. The base of the flap was at the level of the inframammary crease. A peri-areolar and infra-areolar scar was an inverted T shape.

1976—**Coutriss.** Transposition of the NAC through a pyramidal and de-epithelialized flap with a pedicle on the distal base at the level of the inframammary crease. The outline of the skin incisions is shown as in Strömbeck's technique**.**

1977—**Dinner and Chait.** Use the technique described by McKissock, but with fixation to the aponeurosis of the pectoralis with isolated and non-absorbable stitches on infra-areolar part of the bipedicled vertical de-epithelialized flap.

1977—**Courtiss and Goldwyn.** Transposed the NAC using a de-epithelialized flap with a half-moon pedicle based on the entire length of the inframammary crease. The outline of the skin incisions were made with the aid of a key-hole-shaped mold as used in McKissock's technique.

1977—**Fígallo.** In ptosis without hypertrophy, designed an equilateral triangle around the areola with a 6- to 8-cm side and distal base, below which the outline of the recessed area was traced, as in Strömbeck's technique. The de-epithelialized skin between the areola and equilateral triangle up to the groove was delimited by the Wise's mold and the inframammary crease, as in Strömbeck's technique. The skin around the triangle was carefully undermined. Below the triangle and with the same width of the base, he created a dermal–adipose flap with a proximal pedicle and separated the gland from the aponeurosis of the pectoralis major. Introduced the distal end of this flap into the retroglandular space and sutured it to the fascia of the pectoralis major, at the level of the third intercostal space.

1977—**Arufe, Erenfryd, and Saubidet.** Carried out the transposition of the NAC through a de-epithelialized vertical flap with a proximal pedicle with the areola and nipple free at its extreme or distally. The flap was narrow; its distal and lateral margins were only 0.5 cm from the margin of the areola.

1977—**Sperli.** Treated breast ptosis using Arié and Pitanguy's technique modified using de-epithelialized flaps for fullness of the breast. Three to six months later when necessary, silicone implants were inserted.

1977—**Franco, Rebello.** Published a book entitled *Aesthetic Plastic Surgery*.

1977—**Uriburu.** Published a book entitled *The Breast*.

1978—**Kaplan.** Made a circular incision around the areola 4–5 cm in diameter, completely separate from the breast, excised the adipose–glandular tissue that had hypertrophied, leaving the NAC fixed to the part not excised from the proximal or distal quadrant with transposition of the NAC and excision of the excess skin. Cutaneous suture left peri-areolar and infra-areolar inverted T-shaped scars.

1978—**Spadafora.** Cutaneous incisions designed with the aid of Wise's mold, as in Strömbeck's technique, which was modified using similar maneuvers to Pitanguy technique.

1978—**Whidden.** In cases of ptotic breast with flaccidity, he carried out a vertical pinch maneuver from the nipple to the inframammary crease with invagination of the skin. He kept the invaginated skin and made several simple provisional points. Then, he carried out the same maneuver, pinching the skin horizontally above the inframammary crease and with simple

provisional points, kept the invaginated skin. Thus, with the provisional points, a shaped breast resulted. After obtaining the desired shape and position, the position of the points was marked with transcutaneous methylene blue and removed, obtaining a design that limited the skin area to be ablated.

1978**—Pitanguy.** Published a book on mammoplasty in which the principles and technical details that were employed were analyzed and described.

1979**—Hugo and McClellan.** Marked the skin incisions as in Strömbeck's modified technique, to effect the transposition of the NAC through a narrow and thin de- epithelialized flap with the nipple and areola and the proximal pedicle. Excision proceeds as in McKissock's technique as if excising the infra-areolar pedicle.

1979**—Baroudi, Keppke, and Carvalho.** In selected cases, they carried out breast reduction associated with inverted abdominoplasty. For the mammoplasty, they used Pitanguy's technique and in the inverted abdominoplasty the technique described by Franco and Rebello.

1979**—Hoopes and Maxwell.** Marked the skin incisions with the aid of Wise's model. They carried out a large detachment of the skin to facilitate the lateral and medial gland excision, leaving much of the gland behind the NAC to give it greater projection.

1979**—Peixoto.** Made minor skin excisions, even when the gland excisions were large, giving an infra-areolar scar, resulting in an inverted T shape with the horizontal branch in a much smaller submammary groove that occurs in most of the techniques that result in this type of scar. The surgical marking for medium and large hypertrophy, differed only slightly in the dimensions of the infra-areolar lines. The author based this technique on the capacity for skin contraction and informed that, after a few months, the skin wrap to readjust the content was decreased. The glandular excision was made on the dorsal part of the gland, with the pectoralis major muscle.

1979**—Riquet.** He used Pitanguy's technique plus a triangular dermal—adipose flap technique with the lateral base of the distal part of the breast and sutured to the pectoralis major muscle. He reported that, with this flap, the transposition of the NAC was facilitated.

1979**—Castro.** Employed Pitanguy's basic technique, making the curved incisions to achieve more stable surgical results.

1979a, b**—Lima.** In patients with small hypertrophy, he did not perform nipple–areolar transposition or excision of the skin. Through an incision in the inframammary crease, glandular tissue was excised with the same shape as a silicone breast implant. He believed in the contraction of the skin, as described by Peixoto.

1979a, b**—Lima.** In large hypertrophy, he performed extensive glandular excision, emptying the breast behind the NAC, which was implemented through a wide and thin de-epithelialized flap, with a proximal pedicle, leaving the infra-areolar scar in an inverted T shape. The procedure was similar to the technique described by Ramil Sinder (1970).

1979a, b**—Goergiade et al.** Analyzed the results of reducing mammaplasties performed in 218 patients using various techniques over a period of 5 years. They gave preference to using a de-epithelialized flap with a distal pedicle with 6–7 in width for transposition of the NAC, but maintained their connection to the pectoral fascia. In some cases, they added a small de-epithelialized flap on the inframammary crease, similar to that described by Ramil Sinder (1972).

1979**—Herrera and Heredia.** Marked the incisions using Strömbeck's pattern, and de-epithelialized the area to a transverse line through points B and C, forming a flap with the distal pedicle in the center of the inframammary crease. The medial and lateral parts were undermined and its extremities were sutured together in the midclavicular line, increasing the central volume of the flap, which was introduced behind the NAC.

1979**—Cloutier.** Reported on volume reduction mammaplasty.

1979**—Huang, Parks, Stephen.** Performed outpatient breast surgery under intercostal block anesthesia.

1979**—Myr y Myr, Planes, Caragol.** Reported the value of preoperative thermography

in patients undergoing reduction mammaplasty and mastopexy.

1980—**El-Sahy.** Employed McKissock's technique, but positioned the NAC after excision of the excess tissue and suturing of the glandular breast, as already advocated by Adams in 1944. He also made combined use of Wise's model, as in Strömbeck's technique, and McKissock's keyhole-shaped mold incisions to mark the new areola.

1980—**Psillakis and Avelar.** Organized the Brazilian Symposium on Breast Surgery sponsored by the Brazilian Society of Plastic Surgery—Region of Sao Paulo, with participation of a large number of Brazilian plastic surgeons. Surgical demonstrations were performed by Pitanguy and John Bostwick. During the event, several new techniques were presented by Brazilian plastic surgeons (such as Peixoto, Aleixo Sepúlveda, Costa Lima, Avelar, Pigossi, Chidid, Cardoso, Ribeiro, Pontes, Carreirão, Estima, Sperli, Silveira Neto, Souza Pinto, Andrews, and Sinder), which became important contributions to breast surgery. It was a remarkable meeting with great improvements being made in the mammaplasty field (Fig. 6.12).

1980—**Costa Lima.** Described a technique for reduction mammaplasty in large hypertrophic breasts and gigantomastia without a nipple–areola graft. He created a long de-epithelialized flap with transposition and ascension of the areola and nipple.

1980—**Erol and Spira.** In medium and moderate ptosis without hypertrophy, they made a circular incision around the areola with wide undermining of the skin and vertical plication of the gland in two or three planes between the areola and the submammary groove, and sutured the peri-areolar incision. They believed that the contraction of the skin occurred after some time; there was the same accommodation for the gland as described by Peixoto.

1980—**Mathes, Nahay, and Hester.** In patients with small hypertrophy, they carried out NAC transposition using a de-epithelialized flap with a proximal pedicle. In gigantomastia they performed a NAC graft. In both cases, they used a de-epithelialized flap, which was inserted between the gland and the pectoralis major muscle.

1980—**Avelar.** Presented a dermal–adipose–glandular flap with a superior pedicle and rotation from down to upward for correction of breast ptosis with or without inclusion of silicone implants (Fig. 6.13).

1980—**Ariyan.** Transposed the NAC using a de-epithelialized vertical flap with the nipple and areola with one distal pedicle or with two pedicles: one proximal and one distal. He mentioned that he used a monopedicle 30 cm in length and 51-cm bipedicles.

1980—**Peixoto.** Presented his new technique on mammaplasty with mention of a reduced scar with skin retraction after the operation.

1980—**Chidid.** Made dermal–adipose flaps with a proximal pedicle to create fullness in subcutaneous mastectomies.

1980—**Ashbell.** Commented on the paper: *Out Patient Breast Surgery under Intercostal Block Anesthesia*.

1980—**Farina, Newby, and Alani.** Published a very important investigation about innervation of the NAC.

1980—**Franco.** Axial flap from the inferior pole of the breast.

1980—**Pigossi.** Presented a new technique for reduction mammoplasty at the Brazilian Symposium on Breast Surgery. Sponsored by the Brazilian Society of Plastic Surgery—Region of São Paulo, August 1980, São Paulo.

1980—**Planas and Mosely.** Employed Strömbeck's modified technique. They maintained connection to the distal part of the tissues that they planned to excise to ensure that they were not missed. They did not excise the glandular cylinder's supra-areolar surface delimited by Wise's and Strömbeck's models and caused a small amount of undermining at the ends of the horizontal bipedicled flap used for NAC transposition.

1980—**Mathes, Nahai, Hester.** Published the article *Avoiding the flat breast in reduction mammaplasty*.

1980—**McKissock.** Made an interesting discussion about the article *Avoiding the flat breast in reduction mammaplasty*.

1981—**Sepúlveda.** Presented a new approach to ptotic mastoplasty, leaving a small scar around the areola and a J- or L-shaped one.

Fig. 6.12 Brazilian Symposium of Breast Surgery—August 1980

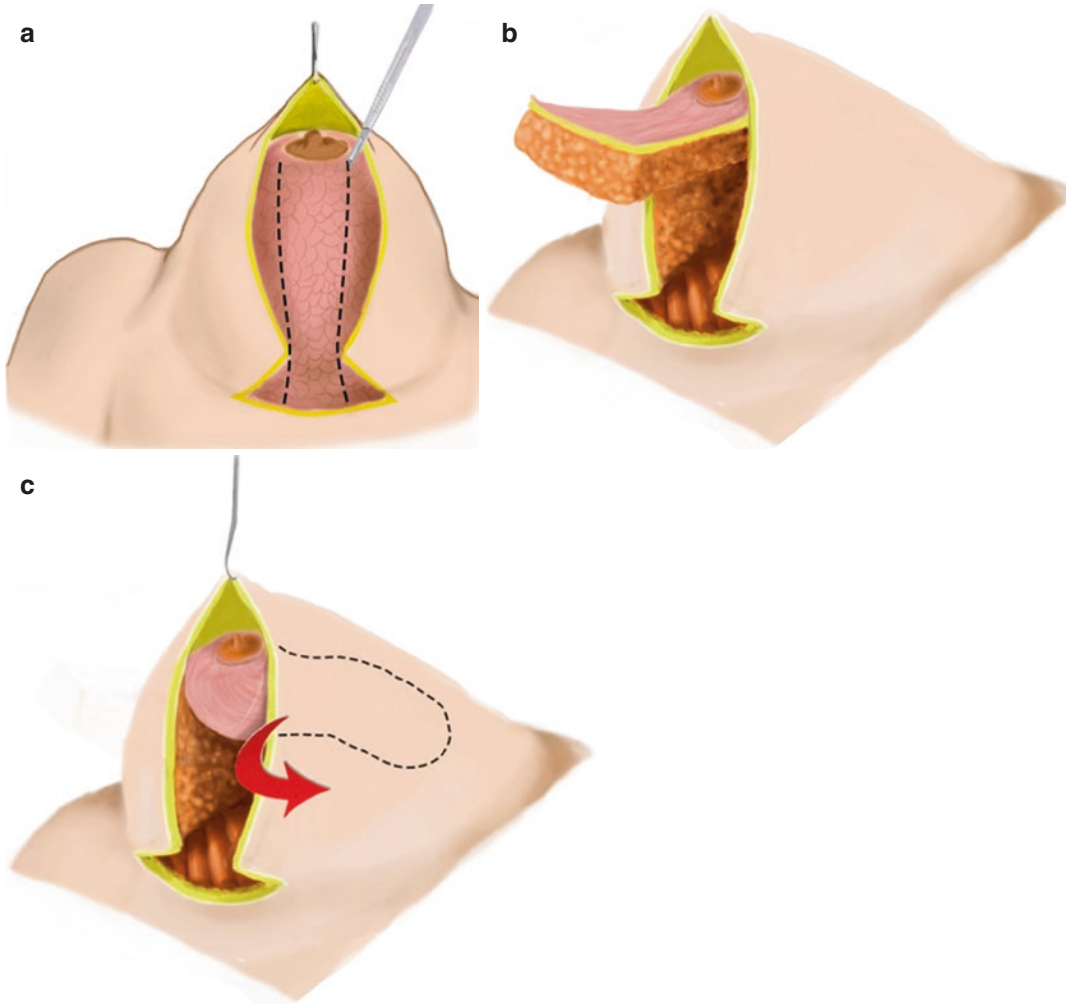

Fig. 6.13 Avelar—1980

1981—**Lassus.** Reported on vertical mammoplasty. Transposition of the NAC through a vertical flap with the areola with a proximal pedicle, an infra-areolar vertical excision, resulting in peri-areolar and vertical infra-areolar scars.

1981—**Balch.** Operated with the patient in the Trendelenburg position, with 10–15°. He de-epithelialized around the areola, an elongated vertical area in the shape of a keyhole. He performed dermal–adipose–glandular excision with infra-areola-shaped horizontal incision. The resulting scar was peri-areolar and infra-areolar in an inverted T shape.

1981—**Zelnik et al.** Studying vascularization of the NAC, they found that, in most cases, there were three intercostal perforations in each of the fourth, fifth, and sixth intercostal spaces. Based on this finding, these spaces are now included in the de-epithelialized flap base with the distal pedicle used for transposition of the NAC.

1981—**Spadafora et al.** In young patients with small hypertrophy, glandular excision was made through a small incision in the inframammary crease. The excision was carried out on the dorsal surface of the gland and not on excised skin.

1981—**Wray and Luce.** Reported the approach followed in two cases of sloughing of the nipple observed on the first day after breast reduction. They excised devitalized tissue with remodeling of the breasts and made a nipple–areola graft.

1981—**Shanoff and Tsur.** Reported a case of a complication 1 month after breast reduction in which necrosis and suppuration were observed. They excised the commitments tissues and created a NAC graft on both sides.

1981—**Schultz and Markus.** Created a NAC using a vertical de-epithelialized flap with a distal pedicle 8–10 cm in width. In the new position of the NAC, they de-epithelialized the skin, forming a circular flap with a proximal pedicle as a platform to project it.

1981—**Sepúlveda.** Carried out excision in the infero-lateral segment of the breast. The excess skin was excised and de-epithelialized partly so that the resulting scar was peri-areolar and infra-areolar with a U or J shape, without extending to the inner side of the inframammary crease.

1981—**Raventós.** Employed a modified Dufourmentel and Mouly technique. He de-epithelialized a segment of skin in the infero-lateral part of the breast and excised a radial segment of the glandular tissue.

1981—**Pontes.** Based on his work published in 1973, the author presented two variants of his mammoplasty method: variant I was used in small and medium hypertrophy after incising the gland at right angles to the chest wall and excising the distal excess glandular and fatty tissues. Variant II was employed in large hypertrophic breasts in which adipose tissue in the glandular breast base of the cone was excised and this excision was extended, removing more tissue contour around the gland, leaving the central portion intact to the papilla and areola.

1981—**Letterman and Schürter.** Performed excisions of the glandular tissue similar to a keel shape on an infra-areolar segment. To facilitate elevation of the NAC they made two incisions on the adipose–glandular tissue on each side of it at the base of the de-epithelialized triangle after Schwarzmann's maneuver.

1981—**Marchac and Clarte.** In small and moderately hypertrophic breasts they made a transverse skin incision of 6–12 cm in length about 4–5 cm above the NAC, with the center of the nipple and another vertical line about 10 cm from the medial line. To excise the excess glandular tissue, an incision was made above that line. When the vertical cutaneous suturing was performed, "dog ears" were formed on each side, which were removed. The final scar was an inverted T shape, as the horizontal or transverse segment was smaller than in other techniques.

1981—**Dargallo.** Published the paper entitled *Mammary reduction with dermopexy*.

1981—**Goldwyn.** Wrote a discussion about the paper *An Urgent Reduction Mammaplasty*.

1981—**Pitanguy.** Published the book *Aesthetic Plastic Surgery of Head and Body*.

1981—**Singer, Krant.** Carried out intravenous fluorescein for evaluation of the dusky NAC during reduction mammaplasty.

1981—**Sperli.** Published the article *Shaping surgical dressing in mammaplasty (new reusable method)*.

1982—**Avelar and Padovez.** Described mastoplasty in association with abdominoplasty with evaluation of surgical results in 40 operated patients.

1982—**Carvalho and Baroundi.** Used the technique described by Pontes in reducing mammaplasty and Arié's modified technique in cases of mastopexy. They presented technical details that were employed for best projection to the NAC. They drew a circle 4 cm in diameter at the new position of the areola.

1982—**Claredon.** Transposed the NAC through a de-epithelialized flap with a distal pedicle at the level of the inframammary crease. The mammary gland was sutured to achieve the best projection of the NAC.

1982—**Juri et al.** In small hypertrophy and ptosis, they carried out vertical mammoplasty. After excision of excess fat and glandular tissue they made a triangular skin excision with a proximal base and understanding held by the areola.

1982—**Nicolle.** Used Wise's mold placed obliquely on the inframammary crease; thus, the final scar was also obliquely papillary–areolar. The transposition of the NAC was carried out using a dermal–adipose–glandular de-epithelialized flap with s superolateral pedicle.

1982—**Bozzolla.** Performed mammoplasty through an inferolateral excision, leaving an L- or J-shaped scar. His method could be performed by surgeons who were not used to employing it.

1982—**Loya and Ryan.** Made a peri-areolar incision similar to a ring. Through this opening, they excised and sutured part of the glandular tissue. Then, they found that the external incision was larger than the internal one. They sutured the skin and resected a triangular segment and on the external margin. After suturing, they concluded that some small scars were left around the areola.

1982—**Kostionovsky.** Described the adaptability of McKissock's technique in diverse mastoplasties.

1982—**Bernadello and Bragadini.** Reported on glandular resection in reduction plasties for mammary dysplasia.

1982—**Mouffarege.** Described mammaplasty with an inferior dermal glandular pedicle.

1982—**Fará and Hrivnakova.** Carried out transposition of the NAC in patients with large hypertrophy through a long de-epithelialized flap with a proximal pedicle folded over itself. The resulting scar was around the areola and shaped like an inverted T.

1982—**Labandter, Dowden, Dinner.** Advocated the inferior segment technique for breast reduction.

1982—**Nicole.** Published on improved standards in reduction mammaplasty and mastopexy.

1983a, b—**Reich.** Left the NAC in the central and distal segments of the breast, which remains attached to the chest, forming a de-epithelialized flap with dorsal and distal pedicles consisting of derma, fat, and gland. The excision of the excessive tissue was done above and on the side of this flap. The final scar was peri-areolar and infra-areolar with an inverted T shape.

1983—**Elly.** In ptotic breasts he made a superficial skin incision in a half-moon shape with the distal edge of the areola, and de-epithelialized a vertical segment of skin in the infra-areolar region. The distal end of the flap had a proximal pedicle and was folded and positioned behind the NAC, to improve its projection.

1983—**Hurst, Evans, and Murray.** Presented modifications of Robertson's technique, which used areolated distal pedicle flaps.

1983—**Soussaline.** Presented a technique for the transposition of the NAC using a nipple–areolar flap with a proximal pedicle. The final scars were peri-areolar and infra-areolar in an inverted V shape.

1983—**Meline.** Described a procedure for the treatment of moderate ptotic breast through cutaneous excision of a vertical fusiform on the distal pole, including a sector or triangle of the areola. The final scar was infra-papillary, vertical, and an inverted T shape, avoiding the peri-areolar scar.

1983—**Ho and Pelly.** Showed technical details for optimal positioning of the NAC and the vertical and horizontal sutures, especially when resulting in scar with a U or J shape.

1982—**Hirshowitz and Moscona.** Published some modifications of McKissock's technique.

1983—**Palma.** Presented surgical details of his method that avoided medial scarring on the nipple–areolar inframammary to increase its projection. The resulting scar was vertical infra-areolar and there was distal curvature of the areola.

1983—**O'Keeffe.** Described a method of mammaplasty with absence of the medial scar.

1983—**Teimurian and Adham.** Presented treatment for the tuberous breast, performing ring de-epithelialization of the peri-areolar skin to give a conical shape to the breast, excising four wedges in the peripheral area of the NAC with inclusion of the subpectoral breast implant.

1983—**Brown, Raunsley, Lawe.** Presented on autologous blood in patients undergoing subcutaneous mastectomy or reduction mammaplasty.

1983—**Castro et al.** Described reduction mammaplasty through the technique of dermal–adipose flap with an inferior pedicle.

1983—**Castro, Araújo.** Reported on later results of mammoplasty.

1983—**Crow.** Reported on the refinements of reduction mammaplasty.

1983—**Pina.** Published technical refinements for mammaplasty.

1984—**Hauben.** Carried out NAC transposition through a flap with the areola on the superomedial pedicle that was obtained for the area after Schwarzmann's maneuver by an incision extending from point A of the midclavicular line to the lateral margin of the areola, which was rotated upward and out to its new position. He achieved greater projection of the NAC.

1984—**Cardoso.** Performed mammoplasty with transposition of the NAC in a de-epithelialized flap with three pedicles: two proximal supra-areolar and the other one distal or infra-areolar.

1984—**Chidid.** Used de-epithelialized triangular flaps at the distal part of the flap sutured below the areola to reinforce the union of the vertical scar with the horizontal scar.

1984—**Nicolle.** Used two molds (left and right) similar to those described by Wise and Strömbeck, but with the most elongated medial part of the side. He performed transposition of the NAC using a supero-lateral flap, leaving an infra-areolar scar in an inverted T shape.

1984—**Andrews.** Reduced the horizontal branch of the inverted T-shaped infra-areolar scar, excising less skin on the medial and lateral sides.

1984—**Dowden et al.** Showed surgical details of the modification of McKissock's technique for mammoplasty with a vertical de-epithelialized flap in asymmetric hypertrophy.

1984—**Spence.** Proposed designation of symmastia for cases of breasts together in the midline. He described treatment of two patients with this feature.

1985—**Bustus.** Described mammoplasty by peri-areolar incision using a tripartite flap with distal pedicles.

1985—**Felicio.** Performed a peri-areolar breast lift, leaving the NAC with a glandular pedicle and two dermal pedicles: one was medial and the other lateral.

1985—**Peled.** Proposed intradermal peri-areolar suturing as a tobacco packet shape with nylon or Dexon for the surgical treatment of gynecomastia and tuberous breast, for reduction and better distribution of the tension.

1985—**Hester et al.** Performed skin undermining with 2 cm of adipose tissue up to 2–3 cm from the chest wall; excised the periphery of the gland, leaving intact its central part with NAC and excised the excess skin. The final infra-areolar scar was an inverted T shape.

1985—**Peixoto.** Performed the infra-areolar longitudinal incision in reduction mammaplasty.

1986a, b—**Avelar.** Described liposuction associated with reduction mammaplasty as an important complement to facilitate the surgical procedure and to reduce the final scarring.

1986—**Tostes.** In moderate ptosis and hypoplasia, he used two dermal–adipose–glandular flaps with a proximal pedicle fixed behind the NAC to increase its projection. The infra-areolar scar was shaped like an inverted T.

1986a, b—**Avelar.** Described the importance of the liposuction technique for the treatment of adipose gynecomastia. It showed that only the adipose tissue was aspirated, as the mammary parenchyma must be resected after liposuction.

1986—**Lassus.** Performed transposition of the NAC in a flap with a proximal pedicle. Infra- and retro-areolar excision was carried out, leaving a vertical infra-areolar scar.

1986—**Maillard.** Performed partial adipose–glandular excision at the base of the breast. Infra-areolar Z-shaped scar.

1987—**Bozzolla et al.** Systematized mammoplasty technique with an infra-areolar L- or J-shaped scar, which had been presented in 1982.

1988—**Berrino et al.** Treated unilateral hypertrophy through vertical and infra-areolar adipose–glandular excision at the base of the breast.

1988—**Elliot.** For treatment of tuberous breasts, he employed a horizontal triangular flap along the inframammary crease transposed to the central infra-areolar part, increasing the width of the base of the breast.

1988—**Kroll.** Studied the use of a de-epithelialized flap with a distal pedicle compared with the same type of flap without the skin, concluding that there was no difference in the safety of vascularization.

1988—**Gradinger.** Preferred to use free NAC graft in cases of large hypertrophy and gigantomastia, and showed surgical details that facilitate improving the results.

1988—**Benelli.** Performed peri-areolar mammoplasty by suturing the external border of the circular wound to reduce the centrifugal tension, similar to the method employed by Isaac Peled (1985) in cases of gynecomastia and tuberous breast.

1989—**Ribeiro.** Published the book *Plastic Surgery of the Breast* published by MEDSI, in

which a variety of uses of de-epithelialized infra-areolar flaps in reduction mammoplasty were shown, with transposition of the NAC.

1989**—Toledo et al.** Performed peri-areolar reduction mammoplasty in association with liposuction.

1989**—Ship et al.** Employed two de-epithelialized flaps with the same pedicle in the distal pole fixed in the aponeurosis and pectoral muscle.

1989**—Martins.** Described peri-areolar breast reduction by excising the excess adipose–glandular tissue of the proximal part of the breast.

1989**—Goes.** Described peri-areolar mammoplasty using a circular peri-areolar dermal flap as an external reinforcement.

1989**—Sinder.** Wrote the first chapter of the book *History of Breast Reduction*, edited by Liacyr Ribeiro (published by MEDSI).

1990**—Lejour.** Published on mammoplasty with an almost vertical infra-areolar scar with transposition of the NAC using a flap with a proximal pedicle. She sutured the gland to improve the shape of the breast through discreet skin detachment.

1990**—Lejour.** Described liposuction in association with vertical mammoplasty (no scar on the submammary groove).

1990**—Hinderer.** Based on Peled's publications (1985) and Benelli (1988), he added a second purse string suture to achieve better projection of the NAC.

1991**—Bozolla et al.** Presented a method for calculating preoperatively the extent of the horizontal final scar of the reduction mammoplasty as L-shaped, based on breast ptosis.

1992**—Almeida.** In moderate hypertrophy, he made a distal peripheral intra-areolar semicircular incision, similar to that published by Webster in 1946 to treat gynecomastia.

1992**—Bustos.** Presented breast reduction and peri-areolar and made a silicone blade in the skin for gland support, which developed severe complications.

1992**—Chiari.** Published mammoplasty with an L-shaped scar with geometric planning and marking for the skin incisions and glandular resection.

1992**—Robbins and Hoffman.** Performed transposition of the NAC through a supra-areolar vertical de-epithelialized flap identical to the flap published by Weiner et al. in 1973.

1992**—Erfon et al.** Carried out NAC transplantation in a thick dermal–adipose–glandular flap with a reduced final scar.

1992**—D' Assumpção**. Used a triangular cutaneo-adipose flap with a distal pedicle in the inframammary crease, achieving a final scar similar to a W.

1992**—Fuente and Yesso.** Presented peri-areolar mammoplasty with glandular excision in the shape of an infra-areola keel.

1992a**,** b**—Aiache.** Presented a semi-circular peri-areolar incision in reduction mammaplasty.

1992**—Yousif et al.** Preferred to avoid a vertical infra-areolar scar. They employed areolar and inframammary crease incisions.

1992a**,** b**—Hinderer.** Published *Mammaplasty with a periareolar scar: historical evolution and actual state*.

1993**—Auclair and Mitz.** Presented peri-areolar mammoplasty; superomedial, superolateral and infra-areolar glandular excision, including a Vicryl network as a "subcutaneous suture".

1993a**,** b **Avelar.** Wrote the book: *Loco-Regional Anesthesia for Aesthetic Plastic Surgery* with emphasis on mastoplasty under local anesthesia, published by Hypocrates Ed., São Paulo, Brazil.

1993a**,** b **Avelar.** Published a chapter with emphasis on the use of his dermal–adipose–glandular flap with superior pedicle in mastopexy.

1993a**,** b**—Marconi and Cavina.** They presented the three dermal flaps with proximal pedicles: one infra-areolar rectangular and two triangular, one on each side of the areola, which, after infra-areolar glandular excision, were sutured as subcutaneous reinforcement for the areola and the inframammary crease.

1993a**,** b**—Avelar.** Published on reduction mammoplasty using local anesthesia combined with intra-venous sedation.

1993a**,** b**—Avelar.** Published a chapter about augmentation mammoplasty through mastopexy using a dermal–adipose–glandular flap versus

silicone prosthesis insertion. His flap had been previously described in 1980 at the Brazilian Symposium of Breast Surgery.

1993—**Courtiss.** In selected cases of breast reduction he employed liposuction only.

1993—**Daniel.** Described mastopexy with fixation of a sub-areolar de-epithelialized flap with a distal pedicle under a horizontal bipedicled flap of the pectoralis major muscle.

1994—**Born.** Presented a procedure: after infra-areolar, to close the pectoralis muscle excision of excess tissue, two flaps were made: a lateral rectangular and a medial triangular, which were imbricated, resulting in an infra-areolar horizontal V-shaped scar with a medial vertex or an L-shaped scar in a "lying position".

1994a, b—**Caldeira.** Described the use of the pectoralis major muscle flap to create important fixation of the glandular flaps during reduction mammoplasty and mastopexy.

1994—**Koger.** In gigantomastia, he made a graft of the NAC associated with an infra-areolar de-epithelialized flap with a dorso-distal pedicle to give more projection to the CAP and the proximal pole.

1994—**Daniel.** Published on mastopexy with muscular support. A dynamic and definitive approach to ptosis.

1995—**Harouche.** Used a mold similar to McKissock to mark the incisions. He de-epithelialized a triangular flap with a distal base on each side of the sub-areolar flaps to reinforce the union of the vertical suture with the horizontal suture.

1995—**Caldeira.** Described technical developments to create muscle flaps of the pectoralis major as a resource for fixing the glandular flaps in reduction mastoplasty and mastopexy.

1995—**Ferreira et al.** Separated the infra-areolar flaps of the gland with resection of the excess tissue with direct or crossed sutures.

1995—**Correa.** Through an instrument that was named a subcutaneous endoscope, he performed reduction mammoplasty or mastopexy and abdominoplasty with plication of the aponeurosis, using the same resources as endoscopic surgery.

1996—**Caldeira and Luca.** Published a method through which the breast implant was inserted and fixed inside an envelope created by the inferior segment of the pectoralis muscle. In an adipose breast, with axillary projection, a bipedicled muscular flap was created for fixation to the adipose–glandular tissue. In an adipose breast with discrete axial projection, a muscular flap was sutured to the glandular flap. They used the pectoralis major muscle to sustain the mammary gland. In glandular breasts, its central adipose–glandular pole was covered by two fatty–glandular flaps, one medial and one lateral.

1996—**Goes.** Described peri-areolar mammoplasty with dermal support using an absorbable polyglactin 910 mesh or a mixed network with polyester.

1996—**In Longir.** Presented mammoplasty with an L- or J-shaped scar with fixation of a de-epithelialized triangular flap under the infra-areolar through the pectoralis major muscle.

1996—**Sperly.** Published a book entitled *Mammaplasty. Brazilian procedures, with 49 Coauthors, featuring 62 specific procedures*.

1996—**Gulyás.** Associated peri-areolar mammaplasty with excision of infra-areolar resection to reduce the extent of a vertical scar, avoiding scarring on the submammary groove.

1996—**Saccomanno.** Presented a procedure of breast reduction for moderate and large hypertrophy, based on previous marking of the inframammary sulcus, with an equatorial line crossing below the areola from one end to the other. Dermal–adipose–glandular excision was carried out through a transverse and longitudinal incision following marking. Suturing of the skin was done with stitches similar to a tobacco packet.

1997—**Chen and Wei.** Described a method for reduction mammaplasty with a glandular flap with a proximal pedicle sutured to the periosteum of the fifth rib. The resulting scar was in an S shape, being on the peri-areolar and the other on the infra-areolar segment.

1997—**Oliveira.** Developed a quantitative preoperative evaluation for breast ptosis: except for the thumb, how many fingers found in adduction

of the open hand fit between the submammary groove and the free or distal edge of the breast.

1998—**Cerqueira.** Mammoplasty with a de-epithelialized infra-areolar flap with a proximal pedicle was described. The distal part of this flap was folded back and up and introduced into the pectoralis major muscle by a horizontal opening made through the muscular fibers.

1998—**Fayman.** Vertical mammoplasty was performed: according to the type of breast, he carried out transposition of the NAC with a proximal or distal flap.

1998—**Ribeiro et al.** Correction of tuberous breasts was performed using a peri-areolar technique. They divided the mammary gland using a transverse incision, maintaining the NAC in the proximal half, which corrected the typical constriction of this deformity. The adipose–glandular distal flap was fixed behind the proximal one.

1998—**Atiyeh et al.** Treated tuberous and tubular breasts excising a ring of epidermis around the nipple, but a segment of the peripheral part of the areola was preserved. The derma was then incised to insert the breast implant at the retro-glandular level.

1998—**Würinger et al.** Carried out a breast vascularity study, showing the presence of a ligament or fibrous septum at the level of the fifth rib, containing blood vessels directed to the NAC.

1998—**Aboudib and Castro.** Presented peri-areolar mammaplasty with extensive skin detachment and excision of the excess glandular tissue by a wedge- or V-shaped supra-areolar resection.

1999—**Aiache.** Breast reduction with NAC transposition through a triangular flap with a pedicle in the inframammary crease, resulting in a peri-areolar scar and another infra-areolar scar as an inverted V shape.

1999—**Neuprez et al.** Associated Thorek's technique (breast reduction with NAC graft) with a de-epithelialized flap with a pedicle in the infra-mammary crease.

1999—**Würinger.** After Schwarzmann's maneuver, made an dermal incision on the outskirts of the skin detachment and performed extensive detachment of the skin; excised the excess proximal adipose–glandular tissue and distal to the ligament or membranous septum described by the author and colleagues in 1998; set the same pectoral aponeurosis and excised the excess skin.

1999—**Bozzolla, Cunha, and Mattisti.** Reported on L-shaped mammoplasty.

1999—**Haykal, Calteux**. Employed Thorek's technique with a dermal–glandular flap with an inferior pedicle that they had developed.

1999—**Hall-Findlay.** Described vertical breast reduction based on Lejour's technique, but with NAC transposition using a de-epithelialized flap with a medial or lateral pedicle.

2000—**Nahabedian et al.** In severe hypertrophy, they carried out NAC transposition using a supero-medial de-epithelialized flap.

2000—**Graf et al.** Used a dermal–adipose flap with a distal pedicle fixed cranially under the pectoralis major muscle to increase the projection or filling, based on the technique described by Daniel Milton.

2000—**Caldeira and Luca.** Developed three types of glandular flaps in the distal third of the pectoralis major muscle for breast support. Each one was indicated according to the anatomical and histological type of breast.

2001—**Ribeiro RC, Saltz R.** They published a book about aesthetic and reconstructive breast surgery.

2003—**Sinder.** Published a chapter called *History of Reduction Mammoplasty*.

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