Complete Guide to Mammoplasty

There is a popular theory that suggests female breast origins are a result of sexual selection, explaining why humans have a genetic fixation on breasts and their role in reproduction. In evolutionary terms, breast morphology is also seen as an ornament to attract a partner for reproduction.

A larger bust is considered sexually attractive by heterosexual men and a sign of good health or fertility. Breasts have also been considered to evolve to alert males that their partners were nutritionally advantaged and youthful.

This finding has been further supported by research; males prefer large breasts and a high waist-to-hip ratio, which strengthens the notion that an hourglass shape reflects youth and fertility (Singh & Young, 1995). Additionally, women with large breasts have higher mid-cycle levels of the hormone estradiol which is found to increase fertility, according to a 2004 study in the Proceedings of the Royal Society (Jasieńska et al., 2004).

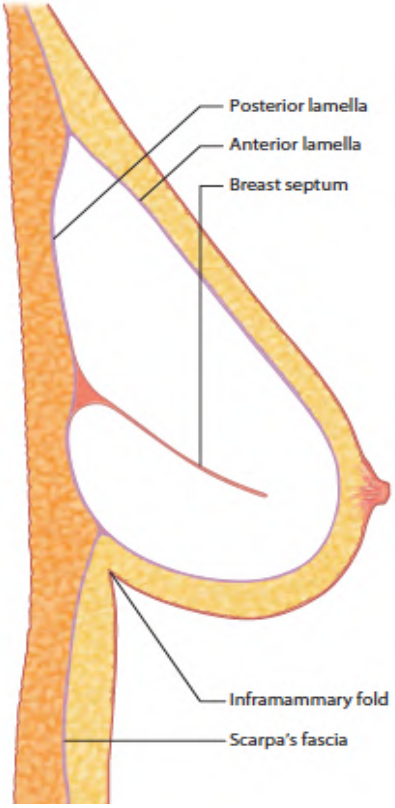
The name Mammalia comes from the fact that species under this classification are commonly known for having mammary glands, and this type of apocrine gland regulates lactation and nutrition. Hominins, however, are the only species with breasts, and the female homo sapien's adipose breasts are a distinctive feature within the homo genus classification.

Permanent, adipose breasts of women are a uniquely human feature, developing during adolescence, long before the first pregnancy. The bone, cartilage, and muscle components surrounding the breast bases, which are suspended to the trunk by their soft tissues, significantly impact the ultimate shape throughout maturation. A "perfect" combination of glandular tissue, fat, skin and connective tissue that holds everything in place in an adult woman may give rise to a "perfect breast."

When it comes to producing consistent outcomes in cosmetic breast surgery, the importance of a meticulous approach to preoperative preparation and planning cannot be overstated. Keeping this in mind, the surgical environment is improved, and the best possibility for an optimal result is achieved both by the patient and the surgeon. The incorporation of latest ideas and practices in mammoplasty is strongly advised as a way of providing consistent quality results.

Breast Anatomy

To understand how aesthetic surgery affects and changes the breast, it is essential to understand the physiological and structural anatomy of the breast. A clear understanding of breast anatomy helps one know cosmetic breast procedures' benefits, safety, and efficacy. By understanding, the patient can better prepare for surgery, and the surgeon can improve their skills.



Women's breasts are tear-shaped glands that sit on the chest wall and are attached to it. Through its intricate vascular system, the breast is rich

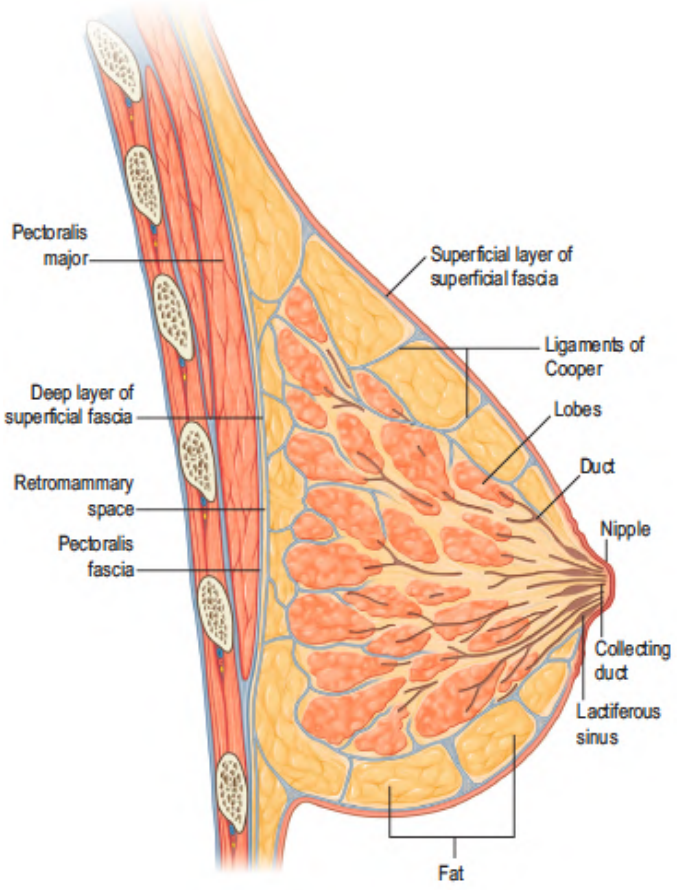
with blood that flows throughout, and its nipple and areola are dense with nerve endings. It is these nerves that make the breasts sensitive to touch.

Fat is the connective tissue that makes up most of the breasts, also known as adipose tissue. Fat tissues protect the breast from damage and assist the integral shape and structure. Breasts with more fatty tissues may be bigger in size. The upper pole of the breast, the placement of the nipple-areolar area, the inframammary fold, and the lateral breast fold are all important breast landmarks.

The breast mound of a non-ptotic breast is positioned between the second and sixth ribs, above the pectoralis major muscle. The upper pole of the breast runs from just below the collarbone to the nipple level. The contour should be a plane that extends to the point of maximal projection of the breast at the level of the nipple, not appearing concave or convex. The nipple-areolar complex (NAC) should appear above the level of the inframammary fold for the ideal breast shape.

Structural Anatomy of a Breast

Many factors influence breast morphology, including fat, glands, skin and connective tissue, muscles and skeletal structure. The breast comprises sections divided into glandular structures known as lobes, and each lobe is further divided into smaller lobules.

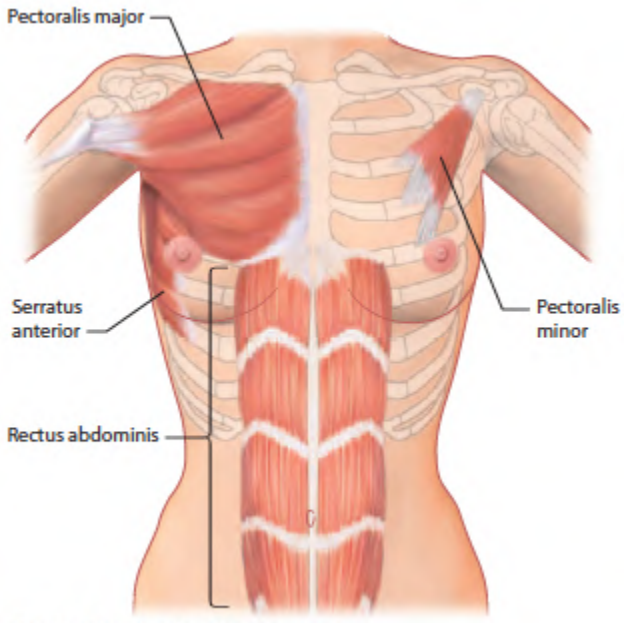


The lobules in women are made up of specialised tissue that generates milk during lactation. Lobules are further divided into lobes; each lobe has about 20 - 40 lobules. The lobes, lobules, and glands are all connected by small tubes called ducts, which help with breastfeeding. Prolactin is a hormone involved in regulating lactation in the breast. The gaps between lobules and ducts are filled with fat.

As well as supporting the nipple, the areola contains Montgomery's glands in both genders, and it keeps the nipple moist. In the region, these glands produce an oily substance that cleans and lubricates the nipple

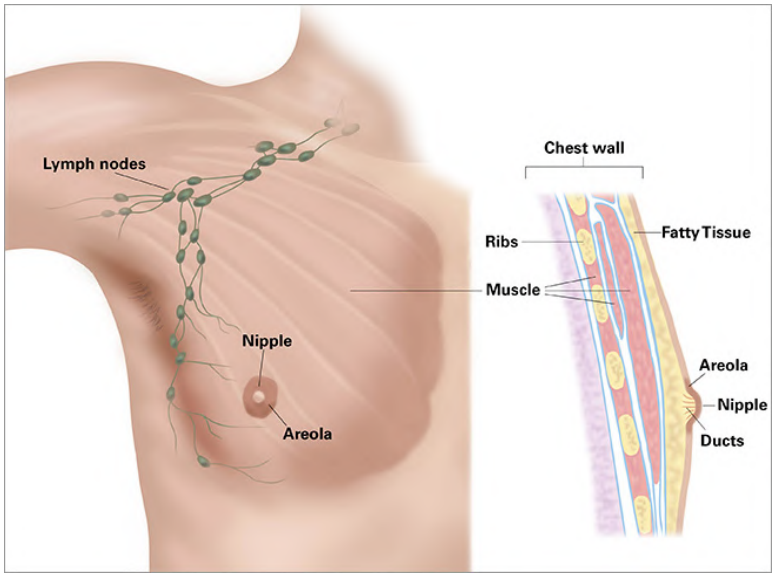
and the areola. This oily substance has antibacterial properties.

Some muscles attach breasts to ribs, but they are not a part of the anatomy of breasts. The breast is anchored to the body by connective tissues and ligaments. Muscle does not exist in the breasts but is located under each breast by the name of pectoral muscles. As the menstrual cycle progresses, oestrogen, progesterone, and prolactin are the three major hormones that influence the breast and control its function.



By the age of 18 to 20, the initial breast development is complete. Subsequent secondary changes in the size and form of the breast occur due to a range of factors such as pregnancy, weight gain or loss, hormonal changes, age, and breastfeeding. As a result, the breast undergoes many changes in appearance over a woman's life.

The anatomy of a typical male breast is almost identical to the female breast structure, except that the tissue of the male breast lacks the specialised lobules. This is because men do not have a physiological need to produce milk.



Skeletal Support

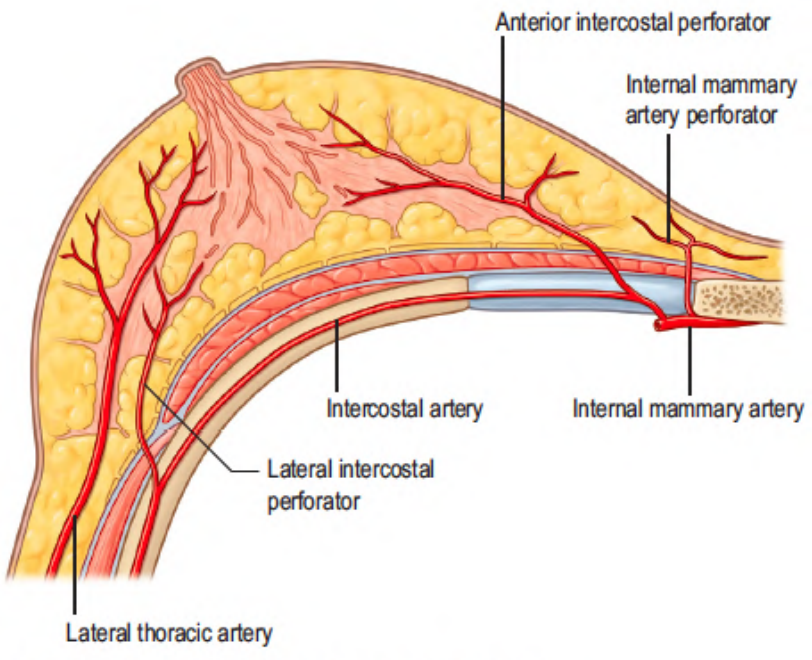
Skeletal support determines the breast form and symmetry. Breast projection can be influenced by chest wall deformities such as pectus excavatum or pectus carinatum. Similarly, spinal anomalies such as scoliosis can impact the overall appearance of breast symmetry.

In Poland syndrome, the pectoralis muscle can be underdeveloped or absent. Breast and nipple anomalies may occur. While abnormalities of the underlying chest wall may be difficult to detect, they must be considered when examining the breasts before surgery by the cosmetic surgeon.

It is important to identify the patient's pre-existing spine curvature and chest wall defect, as these may become more apparent postoperatively and affect the patient's view of the breast's look and symmetry.

Nerves and Blood Vessels

The human breast has a dense network of nerves and blood vessels. Breast tissues receive oxygen and nutrients through this intricate vascular system. It also helps remove the waste material. Several blood vessels are instrumental in providing the nutrients during breast milk production.The internal mammary artery, which runs beneath the primary breast tissue, provides most of the blood flow to the breast.



An extension of the immune system, the lymphatic system fights infections. Many aesthetic breast procedures do not disturb lymph nodes, so the flow is not impeded postoperatively.

Breastfeeding occurs as a result of the nerves reflexively releasing milk in response to the infant sucking. This is known as the milk-ejection reflex. Throughout the breasts, nerves offer sensation, and nerve endings are abundant in the nipples and areola.

Aesthetics and Symmetry in Mammoplasty

Failure to recognise the marked asymmetry in shoulder height could potentially lead to inappropriate surgical positioning of the nipple-areola complex during any mammoplasty procedure. It is due to such preoperative decisions, along with the surgeon's marking of the breasts, that precise and symmetrical results are achieved.

An experienced surgical team or a specialised nurse working directly with the surgeon can optimise the room preparation. The operating table is perhaps the most crucial piece of equipment necessary to complete the surgery effectively. To examine the breast after surgery, the table is tilted up to 90 degrees. This method enables the breast to be assessed while the patient is seated, which aids in effective intraoperative decision-making.

Post operative examination of the breast and the patient's adherence to the recovery instruction during the convalescence period significantly impacts on the aesthetic outcome of breast-related plastic surgery. During the recovery period, the breast settles into its new size and contour for a youthful appearance.

Need for Mammoplasty Procedures

For many patients, breast related cosmetic surgeries have become safe and painless as they become more popular worldwide. Besides cosmetic benefits, the surgery also offers many functional benefits such as treating breast ptosis with a mastopexy, reducing macromastia with breast reduction surgery, enhancing breast fullness with augmentation mammoplasty, and treating gynecomastia among male patients with male breast reduction surgery.

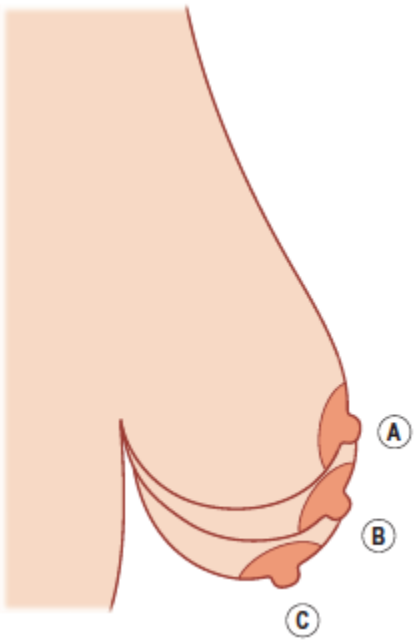
Women may also benefit from other breast-related plastic surgery procedures to improve their breast contour and appearance, which is a source of stress for many. With breast plastic surgery, patients can reverse the signs of ageing and look more youthful.

A surgeon's expertise and experience are necessary for a surgery to be effective, but the patient's commitment to the recovery period is equally important. Understanding the complications and gaining knowledge about the various mammoplasty procedures help the patient make an informed decision.

Breast Lift

The sagging of the breast, medically known as breast ptosis, manifests itself in various ways. Sagging breasts are caused by the skin and ligaments stretching as the volume of the breast increases with age, weight, or hormonal changes. When the breast volume decreases naturally, they cannot retract due to a decrease in skin laxity. As a result, the breast position is lower on the chest wall, its contour changes, and the nipple position changes.

Grades of Breast Ptosis



In the youthful breast, the nipple-areola complex is generally located above the level of the infra-mammary fold. Regnault established a ptosis categorization system that is still relevant for surgical planning:

- First degree: (Position A) The nipple is slightly below or at the same level as the infra-mammary fold.
- Second degree: (Position B) The nipple is located between 1 and 3 cm below the inframammary fold but above the most inferior part of the breast contour.
- Third degree: (Position C) The nipple sits below 3 cm from the infra-mammary crease in the most dependent part of the breast.

Mastopexy seeks to restore the breast's youthful shape and contour by transposing the Nipple and Areolar region to a more youthful position on the breast mound. Breast lift is indicated for patients with ptosis who desire only to change the breast shape but not the volume. Different types of mastopexies are used based on the degree of ptosis and tissue quality. Breast lifts generally do not involve the use of implants. The goals of the surgery are to have a desirable breast contour, a well-positioned nipple, breast symmetry, and a non-redundant skin envelope.

Risks and Complications

If preoperative planning and intraoperative execution are done properly, complications are relatively rare. In a study, it was found that breast lift surgery had a low rate of seroma and hematomas, less than 1 per cent.

Glandular reshaping procedures have been linked to a reduced complication rate. Even though fat necrosis is not always clinically visible, 0.9 per cent of patients experienced symptomatic fat necrosis following gland mobilisation (Summa et al., 2018).

- **Breast Lift Scars**

Dissolvable sutures are employed to close surgical incisions to reduce permanent scarring. But in some cases, genetics, excessive skin tension, or the condition of spitting sutures can exacerbate the degree of scar thickness or scar spreading along the breast mound. During mastopexy, spitting sutures occur when the body rejects the dissolvable sutures. The incision wound becomes swollen, red, or oozing.

It is helpful for patients to understand that suboptimal scarring is possible and to be committed to the recovery procedure. A compression garment and wound dressing designed to relieve skin tension at the scar sites are often all that is necessary. To reduce scarring, qualified surgeons use steroid injections, silicone sheets, and scar massage techniques during recovery.

- **Recurrence of Breast Ptosis**

The major cause of breast sagging is Cooper's ligament stretching. Cooper's ligaments are located beneath the breast skin and through and surrounding the breast tissue, penetrating the superficial fascia in the breast parenchyma. Certain Cooper's ligaments in the breast will remain after a breast lift surgery and are prone to recurrent ptosis as the body ages.

The most important fact is that an eventual ageing process cannot be slowed by mastopexy surgery. It can only reverse the signs of ageing if done properly.

- **Inadequate Aesthetic Results and Malposition of the NAC**

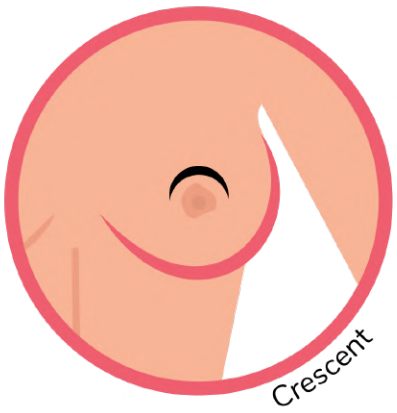
This aesthetic complication can be mitigated by creating preoperative reference markings and customising the procedure. In patients with excessive nipple to inframammary fold distance, areolas can be lowered by removing a transverse section of skin in the lower breast. If nipple malposition is discovered following surgery, the scar tissue should be allowed to heal before making changes.

Areola size, position, and shape can vary mildly postoperatively. Breasts may settle differently over time, causing an asymmetry in shape that can be corrected under local anaesthesia with minor skin adjustments. In most cases, the most common disappointment is a suboptimal degree of upper pole fullness following the breast lift surgery. For this reason, the patient's expectations must be managed realistically at the time of preoperative consultation.

Surgical Techniques of Mastopexy

Depending upon the degree of breast ptosis, various surgical techniques have been described over years. We are describing a few most commonly used techniques of mastopexy.

Crescent Mastopexy Surgical Technique

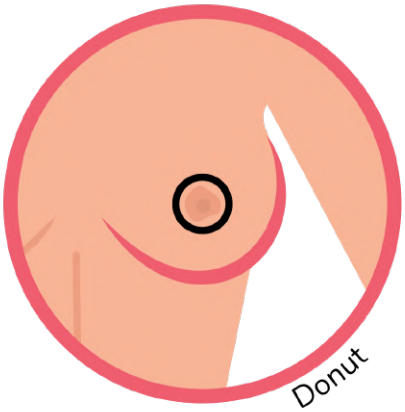


The incision is made on the upper half of the areola, along with the excision of the skin in wedge-like shape above the areolar incision. This technique does decrease the chances of scarring. In this way, the scar becomes almost invisible due to its hiding within the naturally darker pigment of the areola. Still, it may result in a distorted areolar size and shape, compromising the areola's appearance. Firmness and volume can be added to smaller breasts with this procedure. The surgery reduces ptosis in younger breasts with a minor degree of ptosis and leaves minimal scarring.

Advantage: The crescent breast lift technique is effective for minor breast sagging issues and requires only small incisions on the upper side of the breast. As a result, scarring is minimal.

Disadvantage: A crescent lift is best for smaller changes to the breast tissue, and it is not recommended for severe degrees of breast ptosis.

Periareolar Incision Mastopexy Technique

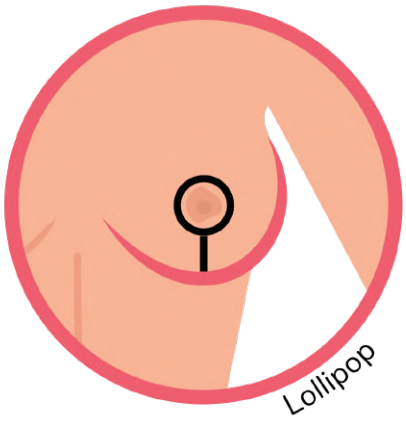


The periareolar breast lift method, also known as a "donut lift," is an excellent choice for females with mild drooping who would benefit from surgical raising. The plastic surgeon will use this procedure to create a single circular incision around the perimeter of the areola, and this procedure produces a barely noticeable scar. Periareolar methods are far more successful at lifting the nipple-areolar complex (NAC) and reducing excess skin for up to grade 2 ptosis. When the NAC needs to be elevated more than 3 cm, flattening of the breast projection usually occurs, and this method does not give ideal results.

Advantage: A periareolar breast lift reduces scarring to a great extent.

Disadvantage: It is possible for the breast contour to become malformed if the surgery is not performed properly.

Vertical Incision Mastopexy Technique



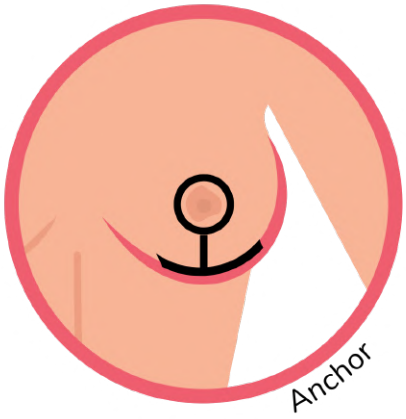
Vertical Breast Lift surgery entails adjustable markings, a pedicle for the nipple-areola complex, another central pedicle which is rearranged to give upper pole fullness, and excision of excess skin. During surgery, a circular incision is placed around the areola, where the plastic surgeon moves the lollipop-shaped incision downwards towards the breast folds. It is the gland rather than the skin that is sutured to create the new breast form. There is no scarring in the submammary fold. While the scar is more visible than that of a donut or crescent lift, patients report that having a vertical breast lift helped them get the dramatic lift they desired, considering the amount of drooping they had before surgery.

Advantage: Its distinctive shape and very small incision make the lollipop breast lift a popular procedure.

Disadvantage: Because of the small surgical area in which to work, the lollipop lift is deemed to be difficult.

Inverted T Incision Mastopexy Technique

The inverted-T incision allows 3D control of the breast, improving the predictability and repeatability of the final result. Recommended to females with a severe degree of breast ptosis, the fundamental pattern of Robert Wise's description of the initial inverted-T operation in 1956 has undergone several changes, but the basic incision remains the same.



In terms of outcomes and complications, all other "short scar" methods are assessed against this approach. During the reshaping process, a circular piece of skin is removed from the peak of the vertical incision to create a matching defect for the nipple-areola complex to be positioned. In this method , the resulting scar extends from around the areola vertically down to the newly created inframammary fold and then extends both medially and laterally in an inverted T manner,

hence the name. The rearrangement of the tissue remains the same as the vertical method.

It is critical to maintaining the inframammary component of the incision as small as possible to avoid skin pattern redundancy and the formation of a 'dog ear' at either the medial or lateral ends of the incision. Its advantage lies in its flexibility to lower the skin envelope even when there is substantial redundancy in the skin.

Advantage: The technique allows 3D control of the breast, improving the predictability and repeatability of the final result of the mastopexy.

Disadvantage: This technique creates a scar at an angle to the original axis.

How Do We Do It?

Using the lollipop incision technique which is also called a vertical lift, we perform effective surgery with minimal scars. With this incision, a superior pedicle tissue and an inferior pedicle tissue is dissected and preserved. The inferior pole tissue is then attached to the pectoralis fascia, below the superior pole tissue. Permanent sutures are used to anchor the tissue to the pectoralis fascia to create the upper pole fullness.

This ensures longer lasting results and decreases the chances of recurrence. The nipple and areolar region is lifted to a more youthful height with a natural look. The media and lateral poles are approximated and anchored to the pectoralis fascia to create the new inframammary fold. Dissolvable sutures are applied in multiple layers to close the incisions. In cases with excess sagging, the incision may take the shape of a ‘J’ turning laterally. The advantage of using this incision lies in the fact that because of absence of medial extension, the incision is not visible along the cleavage line even with low neck dresses.

Breast Reduction

Breast Reduction has several medical benefits along with cosmetic benefits. Patients seeking breast reduction commonly have hypertrophy of mammary glands, excess skin, fat, and parenchyma accompanied by a less-than-aesthetic breast shape. It is possible to achieve a beautiful and long-lasting breast shape by carefully manipulating the breast's volume with intelligent incision planning.

For patients with large breasts or macromastia, chief concerns are:

1. Neck and Back Pain
2. Headaches
3. Shoulder Grooving with painful indentations
4. Rashes in the submammary region
5. Paresthesias (abnormal sensation) in the Hands and Fingers
6. Discomfort in the upper torso
7. Uncomfortable sleep

Many patients may notice an instant reduction of symptoms by removing the excess weight from each breast. Modern breast reduction techniques have been perfected to be safe and scar-free under the hands of an expert plastic surgeon. The main objectives of a successful breast reduction surgery are:

- **Management of Blood Supply to the Nipple and Areolar region:** The preservation of the vascular system in the breast to the sensitive area such as the areola and nipple is important for a natural result.
- **Management of Excess Tissue and Parenchyma:** The superfluous parenchyma must be eliminated while preserving vascularity to the pedicle and NAC to preserve sensation.
- **Management of excess skin:** Removing the sagging skin with surgical precision creates a pleasing shape while hiding the scar in the body's natural contours.
- **Management of the Shape and Aesthetic quality of the breast:** The main goal of the surgery is to reduce the size of the breast to a pleasing and appropriate positioning, as per the mutual decision made by the surgeon and patient.

Risks and Complications

Infection, wound healing issues, scars, fat necrosis, seroma, loss of sensation in nipples, and non-aesthetic results are all possible complications of breast reduction surgery. Increased BMI and smoking are frequently considered key risk factors for surgical complications. With a larger reduction, more risks are involved. The technique of making incisions and pedicles is reviewed with each patient. Risks and complications associated with breast reduction mammoplasty are:

- **Hematoma**

Hematoma development after breast reduction surgery can occur for many reasons but is thankfully uncommon. When postoperative hematomas are minor, they frequently resolve on their own. There is little data to indicate a link between pocket selection or incision site and hematoma rate.

- **Wound Dehiscence**

When wound edges separate due to improper wound healing, they cause dehiscence. Typically, this occurs 5 to 8 days after the reduction mammoplasty while recovery is still in its early stages. The constriction of the blood supply causes this complication to the edges of the skin. To mitigate these factors, the surgeon sutures the margins in multiple layers with the least tension on the superficial layers. Also, it is important to maintain the sterility of the incision site till it heals.

- **Sensory Disturbance in NAC**

With breast reduction surgery, the nipples are always relocated. There is a possibility that the nipple and areola will lose their normal sensitivity, and, in rare cases, the nipples may become too sensitive. Repositioning the NAC and excision too much tissue may make breastfeeding difficult for patients who need to plan for future pregnancies. This can be avoided if the NAC remains attached to the nerve and other essential tissue during repositioning.

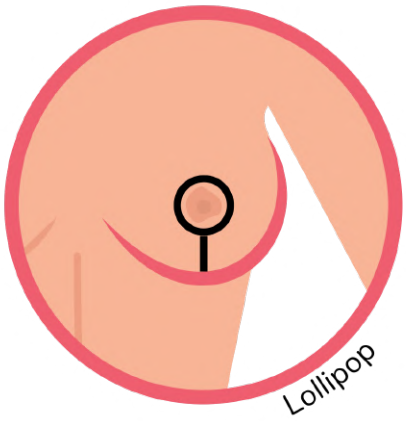
Liposuction for Breast Reduction

Liposuction reduction approaches have concentrated on lowering the degree of epidermal scarring. A standard liposuction procedure is used on the breast through strategically positioned small incisions to allow for a significant decrease in breast volume.

Although it is an efficient procedure to extract fat from the crevices of the breast, the procedure does not serve as a remedy for the ptotic breast skin. The excess skin is prone to a more severe degree of sagging after liposuction and so this is not considered an ideal procedure for reducing breast volume.

Advantage: With liposuction, the advantage is a reduced complication complication rate and easier convalescence period.
Disadvantage: The excess ptotic skin remains unaddressed with a liposuction, causing an unpleasant result.

Vertical Breast Reduction

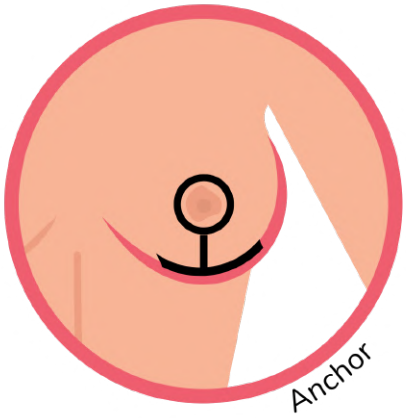


Patients with moderately huge breasts who require a decrease in breast size are frequently ideal candidates for a vertical breast reduction. The procedure allows for a breast reduction with only a periareolar and a vertical scar extending up to the inframammary fold. Based on the preferred pedicle of choice, the nipple areola complex is preserved over the pedicle. The remaining excess breast tissue is excised along with the extra skin and the remaining breast tissue is contoured and rearranged internally, and raised into a more youthful position.

Advantage: As less tissue is removed, it can create a shapelier breast contour and reduce scarring.

Disadvantage: It is difficult to apply on breasts with a severe degree of macromastia.

Inverted-T Breast Reduction



Three incisions are done for the inverted-T breast reduction: one around the perimeter of the areola, one incision vertically from the areola to the breast fold, and one along the crease beneath the breast. Because this procedure allows for easy tissue removal and reshaping, cosmetic surgeons will often utilise it if a patient requires a more severe breast size reduction and has major sagging or asymmetry to address.

Scars from an inverted T or anchor breast reduction are identical to those from a vertical drop, except for one extra scar running down the crease beneath the breast. The scars usually fade within the first year or two following surgery with good care.

Advantage: The technique is predictable and versatile, allowing for good control over both the extent of reduction and the breast-reshaping process.

Disadvantage: Inverted T techniques tend to cause large scars extending up to the medial cleavage.

How Do We Do It?

We perform the vertical incision breast reduction. We prefer to use a superior or superomedial pedicle because of the longer lasting results, better shape and preservation of vascularity of the nipple areola complex. Any size of breast hypertrophy can be reduced by this method. The incision may extend downward to a J shape if too much reduction of breast or removal of sagging skin is required. In patients with less to medium breast reduction, a breast lift may also be performed simultaneously to give a good upper pole fullness. The surgeon preserves a small amount of inferior pole breast tissue and attaches it to the pectoralis fascia to give fullness to the medial pole.

Breast Augmentation

The breast augmentation procedure is the most performed breast cosmetic surgery in India and across the globe. The procedure can be done using implants or autologous fat grafting. A combination of both these techniques is known as composite breast augmentation surgery.

The preoperative assessment determines the appropriate approach, including the choice of implant and the breast pocket. The breast pockets or plane could be submuscular, subfascial, subglandular, or subpectoral with a dual plane. The location of the incision is also decided in this step. The need to lower the inframammary fold is established and marked on the breast skin.

The basic rationale for breast augmentation is insufficient breast tissue volume, often known as glandular hypoplasia. This happens as a result of either a developmental or a genetic process. The location of the inframammary fold is crucial for creating relevant implant placement in the pocket. Changing the surgical approach, implant selection, and operating technique can reduce complications such as implant malposition and capsular contracture.

Evolution of Breast Implants

Breast implants have evolved over the past 50 years to encompass a wide array of commercially available implants today, beginning with the silicone gel implant introduced by Cronin and Gerow and manufactured by Dow Corning. Widely popular, the five generations of silicone by Maxwell and Baker are described hereinafter:

The **first generation implants** (1962-1970) were distinguished by a relatively viscous silicone gel surrounded by a thick, smooth silicone rubber shell with a peripheral seam. They were firm to the touch and teardrop-shaped, with Dacron patches on the back. At the time, experts believed implants needed to be linked to existing tissue to stay in place. These implants have a somewhat high risk of capsular contracture.

In an effort to lessen this and suit surgeons' goal for a less hard, more natural-feeling implant, **second generation breast implants** (1970-1982) were developed. These implants were filled with a thinner silicone gel and encased in a lighter, somewhat porous shell that lacked the Dacron patches. The implants were rounder and softer, giving them a more natural appearance. Because the silicone gel is less viscous and the shell is thin, the implant shells failed with higher rupture rates and silicone gel diffusion (bleeding) through the implant shell.

In an attempt to prevent gel bleed, implant rupture, and capsular contracture, the **third generation silicone implants** (1982-1992) were designed with a more viscous gel and a thicker, smooth or textured shell, as well as a less permeable low-bleed barrier elastomer. These implants have a silicone rubber casing, which results in decreased implant rupture rates and nearly no gel leakage.

The **fourth generation implants** (1993–present) are the current standard silicone gel breast implants commonly available in India and other major countries. Due to refinements in the manufacturing process over the previous generation of implants, the FDA approved fourth generation implants in November 2006 for surgical and cosmetic use.

This **fifth generation of implants** (2012-present) has the same silicone elastomer and low bleed shells as previous generations, filled with silicone gel that is more cohesive and retains its shape better in various positions. By including more of this agent known as a "crosslinker" in the gel, the manufacturer can create an implant that retains its shape more predictably. These implants are called "form-stable," as they are both solid and soft simultaneously, and there is less impact from surrounding soft tissue forces or gravity on them.

The round, smooth silicone gel implant is still preferred in cosmetic breast surgery. Because of the device's adaptability in size and projection, a skilled plastic surgeon can utilise it effectively in almost any patient with the smooth round gel implant. Combining the principles of appropriate implant selection is also essential for outstanding results in breast augmentation surgery.

An implant functions once it is filled to a specific volume and inserted under the breast's soft tissue framework. To achieve the best results in aesthetic breast surgery, it is essential to understand and apply these concepts fully.

Risks and Complications Associated with Breast Augmentation

Breast augmentation surgery is a well-established procedure with excellent success rates and a low complication rate. Currently, capsular contracture and hematomas are the most common problems that necessitate revision surgery. Surgical expertise and recovery care can, however, mitigate these complications.

- **BIA-ALCL:**

In patients with textured breast implants, Breast Implant Associated - Anaplastic Large Cell Lymphoma (BIA-ALCL) can develop in rare cases (Brody et al., 2015). The cancer is of the immune system, not the breast, and none of the cases has been reported on smooth silicone implants.

Most of the time, BIA-ALCL is found in the scar tissue and fluid near the implant, but it can spread to other areas of the body. It is considered unlikely that an individual will develop BIA-ALCL if the implant selection and handling are done properly.

- **Hematoma:**

A hematoma is easily identified by a swollen, bruised breast that is extremely painful to touch or often with arm movement. The best way to avoid hematomas is to achieve careful intraoperative hemostasis. For at least two weeks before surgery, patients should be educated and advised to avoid drugs that promote bleeding or interfere with platelet function. Reoperation with hematoma evacuation, hemostasis, pocket washout, and drainage are all part of the treatment. Implant replacement is rarely required.

- **Seroma**

A seroma may produce symptoms such as a balloon-like skin swelling at the surgery's location. The breast area shows a swollen patch that feels like liquid beneath the skin 7 to 10 days after surgery. The term "seroma" refers to collections of transparent serous fluid that develop in dissected areas post-surgery. It is best to employ a drain after surgery to avoid issues such as infection, scarring, and form distortion caused by a seroma.

It is also possible to avoid this complication by closing the incision immediately after the implant placement with three to five stitches between the muscle inferiorly and the Superficial Fascia System superiorly, tying them together at the end. Antibiotics are administered intravenously and orally in both post and preoperative

duration. Careful planning of surgical technique and control of all bleeding points are preferable during breast augmentation surgery to avoid any potential risks and complications.

- **Implant Capsule Contracture**

Mammoplasty complication capsule contracture is thought to be brought on by an intense foreign body response to the breast implant. It is an inflammatory response that produces fibrosis through collagen formation, resulting in overly tight and painful breasts that, in most cases, require immediate surgical attention.

Silicone implants have a substantially greater risk of capsular contracture, and these ruptures are detected with an MRI scan. Reduced folds, less weakening, and less leakage are all benefits of the fifth-generation cohesive gel silicone implant. The implants are now produced with a cohesive gel that keeps its shape even after breaking. Cross-linking of silicone molecules results in a gel so thick that it cannot bleed out.

Plastic surgeons use the latest techniques to prevent and treat capsular contracture. By taking the following measures, the complication of capsular contracture after augmentation surgery can be reduced:

1. **Patient Selection:**

The patient's physiology should be considered when selecting the correct implant and size. There is a possibility that an existing chronic illness may negatively interact with the implant and worsen it, resulting in capsular contracture.

2. **Prophylactic Antibiotics:**

Preoperatively, the patient is injected with antibiotics so that at the time of surgery, the blood level of prophylactic antibiotics reaches its maximum.

3. **Antibiotic Irrigation:**

It is imperative to perform an antibiotic cleanse with povidone iodine, and antibiotics. The breast and surrounding area are cleaned with a medicated solution to ensure there is no infection source of bacteria or germs. Triple antibiotic betadine wash is used to cleanse the breast cavity and let the antibiotic reach the innermost corner where the implant will be placed.

4. **Nipple Shield:**

Nipples have lactation ducts in which there could be microorganisms that cause infection to the implant and lead to capsular contracture. The surgical field is covered with a plastic patch or nipple shield during the surgery to prevent the spread of bacteria.

5. **Choice of Incision:**

The inframammary incision has been shown to decrease the results of capsular contracture. The other option is the periareolar incision around the areola where you need to cut through the ducts to reach the plane, increasing the exposure of implant to commensals. An axillary incision may increase the chances of infection because of the sweat glands.

6. **Implant Handling:**

By ensuring that the implant is not contaminated during handling, the possibility of bacterial contamination in the silicone breast implant is decreased. During this step of the breast augmentation procedure, it is important to change gloves to fresh powder-free ones.

7. **Implant Positioning:**

Several studies have shown that implants placed submuscularly reduce capsular contracture risk over time.

8. **Hemostasis:**

Not only does maintaining hemostasis during the surgery prevent haematoma, but it also prevents the chances of capsular contracture. Collection of blood can give you an infection. Using prospective haemostasis coagulates the blood vessels before removing them.

9. **Postoperative Medication:**

After surgery, the surgeon prescribes various pain management medications, antibiotics, and preventive medications that are necessary for the patient to reduce the chance of capsular contracture.

10. **Recovery Period**

Patients must follow recovery instructions. Patients are taught how to massage their breasts to prevent capsular contracture.

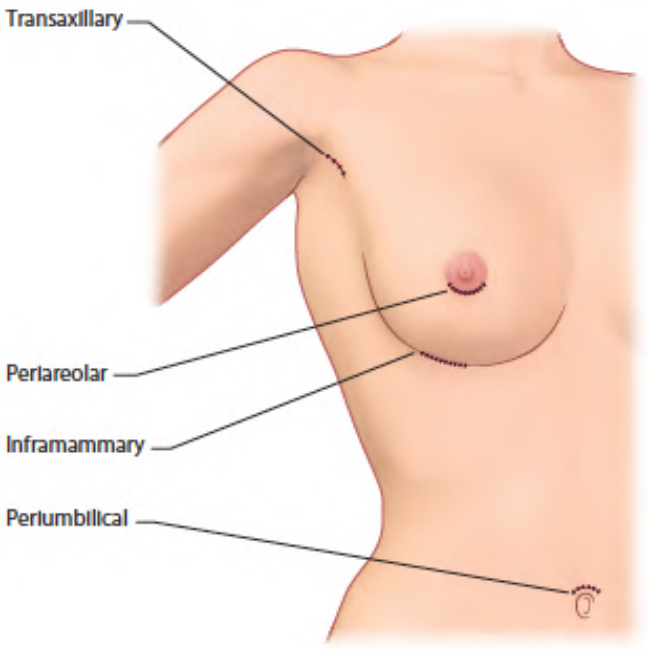
Researchers believe genetics play a key role in who develops capsular contraction and who does not. A patient with a family history of autoimmune disease, relatives who frequently develop thick scar tissue after injury, or who have difficulty with medical implants is at a heightened risk of developing this disease.

It is also commonly considered that a condition known as "biofilm" frequently contributes to the development of capsular contracture. Biofilm is a thin coating of bacteria that forms around implants after a certain type of bacteria, staph bacteria, finds entry into the breast cavity during surgery. This bacteria produces a persistent, low-grade fever with no other obvious signs. However, when the body fights the infection, it develops an increasing amount of fibrous scar tissue, eventually leading to capsular contracture.

Implants need to be placed without ever touching the patient's skin with gloved hands or contacting the skin as they are positioned. Plastic surgeons have switched from a minimal-touch technique to an absolutely no-touch technique facilitated by the funnel instrument. It has been found that by improving the vascularity of the tissue surrounding the implant, autologous fat transfer may treat the complication for capsular contracture.

Incision Planning

When planning an incision for breast augmentation surgery, the plastic surgeon must balance the desire to conceal the incision in an inconspicuous location with the need for easy pocket dissection and implant insertion. A carefully planned inframammary fold incision will allow for the best position and minimise scar visibility. When sutures are placed in the inframammary area, periareolar, or other natural contours of the body, they must be placed with care. The effect they have on the folds must be assessed intraoperatively while the patient is upright.



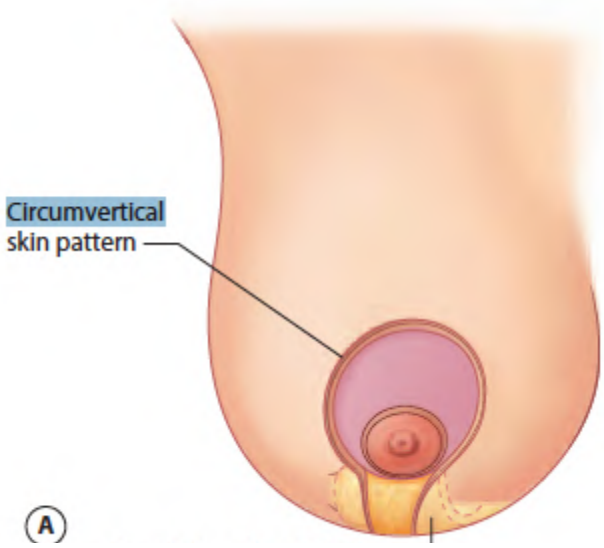
Periareolar Breast Augmentation

Patients with minor sagging of the breast or a malpositioned nipple and areolar region are the ideal candidate for a periareolar breast augmentation procedure. Following the areolar curve that divides the darker skin of the nipple from the rest of the breast, periareolar incisions are made at the outside margin of the areola. Once the incision is done, a pocket is formed, and the implant of choice is positioned. The simultaneous mastopexy improves the connection of the NAC position with the breast mound. Potential scarring can be minimised, depending on the surgeon's skill and the patient's commitment to the recovery process.

Advantage: Scars can be easily concealed.

Disadvantage: Precision is challenging, and complications can arise due to the distance between the incision and the implant location.

Circumvertical Breast Augmentation



Breast augmentation is sometimes combined with mastopexy surgery in patients with sagging small volume breasts, and the circumvertical procedure assists in this process. The circumvertical technique involves making an incision around the areola and a vertical incision reaching from the bottom semi-circle of the areola down to just above the inframammary fold.

It is appropriate in individuals with an inferiorly malpositioned nipple and the areolar region as well as a superfluous and ptotic skin envelope. The reason behind this circumstance is that incorporating a vertical segment into the periareolar pattern not only successfully minimises the dimensions of the skin envelope but is also a potent shaping move that may significantly improve the overall cosmetic quality of the outcome.

Most of the time, the implant should be placed first, and then the circumvertical pattern applied to fit the new breast volume. With this stepwise approach, the circumvertical breast augmentation procedure can control the result most effectively, and the skin envelope is also preserved without risking an over resection.

Advantage: A mastopexy can be performed in conjunction with breast augmentation for superior aesthetic results.
Disadvantage: This technique may lead to hardening of the breast tissue and ruptures where the implant leaks.

Breast Augmentation with Fat Grafting

Transferring localised fat from excess regions such as the abdomen, thighs, or waist to the breast for cosmetic and reconstructive objectives is a surgical breakthrough. This kind of breast augmentation procedure is less

likely to be rejected than silicone or saline implants as fat is taken from the patient's body. For fat grafting, liposuction procedure is coupled with breast augmentation surgery to harvest fat . Meticulous work at each step of fat harvesting enhances the survival of the tissue in the short, medium, and long term. Using state-of-the-art surgical tools ensures minimal damage to fat cells and is less stressful to the body. The benefits are twofold as desirable breast size is achieved and shedding extra body fat.

With advancements in cosmetic surgery science and surgical instruments, this procedure has grown safer and more polished. Professional cosmetic surgeons now have access to cutting-edge liposuction technology like MicroAire and VASER.

Liposuction-assisted breast augmentation is the ideal procedure for breast asymmetries and malformations. Furthermore, the surgery provides satisfactory results for corrective surgery or can be used to correct asymmetry by unilateral implant placement. Patients with Poland's syndrome seeking breast augmentation can achieve desired outcomes through fat grafting. Scarring is minimal to nonexistent after this procedure, and recovery is relatively painless.

Advantage: The procedure is more natural with a decreased rate of complications.
Disadvantage: The complication of oily cystic lumps are more prevalent. Because of the unpredictability of percentage of fat absorption there can be visible asymmetries once the results settle.

Composite Breast Augmentation

Composite breast augmentation procedure uses both implant and fat. With fat grafting, patients with thin cleavages or wide, bony sternums can achieve a softer, more natural appearance by adding fat to soften and narrow the cleavage. As an alternative to traditional breast augmentation surgery, fat grafting can be used to reduce rippling, soften the lateral appearance of the breast, lower the fold of the breast and fill the upper pole. It has become increasingly popular to use fat grafting as an adjunctive technique to change a good result to a fantastic result.
Advantage: A combination technique using both implants and fat grafting ensures the best aesthetic results for the patient.
Disadvantage: The procedure time and recovery is a little prolonged. If not done carefully, there are chances of implant rupture from the fat grafting cannula.

How Do We Do It?

During breast augmentation, we make sure we take all precautions to avoid the risks associated with capsular contracture, the steps of which have been already laid down. An inframammary crease incision of about 4-5 cm is made. A plane is created, either subglandular or dual plane, depending upon the patient's requirement and criteria making sure of absolute hemostasis . We irrigate the cavity with triple antibiotic wash and then insert the implant using a Funnel by the 'No touch Technique'. The inframammary fold is recreated by suturing the pectoralis fascia with the Scarpa's fascia. Incisions are closed with sutures in layers to prevent scar dehiscence and result in good scars. Often in patients with a wide spacing between the two breasts, we combine the augmentation along with fat transfer to the medial cleavage plane. This decreases the spacing between the breasts, resulting in a good aesthetic cleavage and giving an additional cover to the implants medially.

Recovery and Post Operative Measures!

The healing period for all breast surgeries is the same. After the surgery, the patient might experience minor swelling and bruising which increases over the next 48 hours. It is strictly asked to avoid lifting heavy weights. Many patients mistake wearing their regular bra; however, it is advisable to wear a compression garment.

By applying pressure to the tissues and forcing the fluid back into veins and lymphatic vessels, a compression belt assists in reducing and controlling swelling. After the procedures, a clear fluid called Seromas collects in the vacant areas, creating unsettling pockets of transparent liquid. This frequently needs to be cleaned out with a needle's assistance. A compression belt prevents the fluid from building up and causing severe discomfort by compressing these empty gaps.

You may need to spend a few months settling the breasts into their final position. If the surgery is performed correctly, you can restart your everyday work and go on a walk easily.

Bibliography

1. di Summa, P. G., Oranges, C. M., Watfa, W., Sapino, G., Keller, N., Tay, S. K., ... & Raffoul, W. (2019). Systematic review of outcomes and complications in non implant-based mastopexy surgery. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, *72*(2), 243-272.
2. Hammond, D. C. (2009). *Atlas of aesthetic breast surgery*. Edinburgh?: Saunders/Elsevier.

3. Headon, H., Kasem, A., & Mokbel, K. (2015). Capsular contracture after breast augmentation: an update for clinical practice. *Archives of plastic surgery*, *42*(05), 532-543.
4. Jasieńska, G., Ziomkiewicz, A., Ellison, P. T., Lipson, S. F., & Thune, I. (2004). Large breasts and narrow waists indicate high reproductive potential in women. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, *271*(1545), 1213-1217.
5. Kirwan, L. (2002). A classification and algorithm for treatment of breast ptosis. *Aesthetic Surgery Journal*, *22*(4), 355-363.
6. Martinez, A. A., & Chung, S. (2021). Breast Ptosis.
7. Maxwell, G. P., & Gabriel, A. (2014). The evolution of breast implants. *Plastic and reconstructive surgery*, *134*(1S), 12S-17S.
8. Nahabedian, M. Y., Neligan, P., & Liu, D. Z. (2018). *Plastic surgery* (4th ed., Vol. 5). Elsevier.
9. Roça, G. B., Graf, R., da Silva Freitas, R., Salles, G., Francisco, J. C., Noronha, L., & Maluf, I. (2014). Autologous fat grafting for treatment of breast implant capsular contracture: a study in pigs. *Aesthetic Surgery Journal*, *34*(5), 769-775.
10. SIMON, B. E., HOFFMAN, S., & KAHN, S. (1973). Classification and surgical correction of gynecomastia. *Plastic and reconstructive surgery*, *51*(1), 48-52.
11. Singh, D., & Young, R. K. (1995). Body weight, waist-to-hip ratio, breasts, and hips: Role in judgments of female attractiveness and desirability for relationships. *Ethology and Sociobiology*, *16*(6), 483-507.
12. Zhang, M. X., Chen, C. Y., Fang, Q. Q., Xu, J. H., Wang, X. F., Shi, B. H., ... & Tan, W. Q. (2016). Risk factors for complications after reduction mammoplasty: a meta-analysis. *PLoS One*, *11*(12), e0167746.