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PRIVATHOSPITAL

Information on breast augmentation with implants

When are breasts too small?

Of course, there is no right answer to this question. However, breast augmentation surgery is the most common cosmetic surgery worldwide.

There are different conditions that result in small breasts, but the majority of women who wish to enlarge their breasts have perfectly normal (small) breasts.

In plastic surgery we have a tradition of describing the size of breasts and breast implants in milliliters (ml). One ml corresponds to one cm^3.

There is not much sense in discussing breast size without doing so in relation to the rest of the woman's body. It is self-evident that 250ml size breasts will seem much larger on a petite and lean woman than on a plump tall woman. The same goes for implants: 250 ml implants may seem large on one woman and small on another.

A lot of women use their cup size as an indicator of breast size on a scale from an A-cup to an H-cup. The problem with using cup size as a measurement of breast size is that bra size is determined more by the width of the breast on the torso rather than the actual volume of the breasts.

From a biological perspective, full breasts and a wide pelvis are signs of good "child-bearing" capabilities. This perception of the female body evolved into the classic hourglass

body ideal for women. This corresponds to the triangular masculine body ideal, where the shoulders are broad and the pelvis narrow, which biologically are signs of good "provider" capabilities. Today, these ideals are remnants of the ancient human that continue to represent themselves in the mutual attraction amongst heterosexuals.

In our culture, breasts have become an important sign of femininity, both with or without clothes on. Common reasons for choosing a breast augmentation are desire to achieve a better balance between the lower and the upper part of the body or desire for the ability to wear the clothes that the woman feels most comfortable in.

Size of the breasts and body weight

The breasts are made up of gland tissue and fat. The amount of fat increases with age, which is why young women's breasts are firmer than older women's. If a woman gains weight, the breasts will also grow, both because of the fat tissue in the breasts themselves and the fat tissue in the skin on the breasts. Larger weight loss will mean that the breasts will lessen in size and appear more saggy, because the skin expanded while the breasts were larger.

Congenital conditions

Rare congenital conditions can be a complete lack of development of both breast glands, socalled breast aplasia, or lack of development of one breast and the underlying breast muscles, the so-called Poland's syndrome.

A more common congenital condition is underdevelopment of the breast glands. Naturally, the breasts develop throughout puberty in effect of the female sex hormones. During this time, they go through several states, from small "bumps" to little "pyramids" before finally reaching a fully developed state, with the lower half of the breasts forming the shape of a quarter of a globe. If the breasts' development for some reason comes to a halt before final maturity, the breasts will appear small and partly pyramid-shaped. This is also called "concentric breasts". If this limitation in the development is further accentuated, the breast tissue swells in the pigmented area around the nipple, resulting in the breasts having an almost cylindrical shape, so-called "tubular breasts".

The congenital conditions cannot be corrected just by putting in implants, but will often demand more advanced forms of plastic surgery.

Physical and mental maturity

The breasts change in accordance with the hormones and grow and mature throughout puberty. A certain age cannot be determined as to when the breasts are fully developed. With some women, this happens long before they are legal adults, while with others it may not happen until they are in their 20s. A good indication of whether the breasts are fully developed is the shape of the breasts; when the lower half of the breast is full and rounded, similar to the shape of a quarter globe, it is a sign that the breasts are physically mature. The next hormonal effects occur in relation to a pregnancy. During this time, the breasts change again as the breast glands are stimulated to produce milk and the breast swells. In relation to the subsequent breastfeeding, the swelling comes down, reducing the breast volume and sometimes causing the breasts to become more loose.

A breast augmentation should never be performed on an immature breast, and it is commonly recommended that women postpone a breast augmentation until they have breastfed their children.

It is self-explanatory that mental maturity is just as important as physical maturity. It is a big decision to alter your “body image”, and even though the implants can be removed, one can never be ”un-operated” again, and certain complications may persist permanently, even though the implants are removed. As the breasts are an important part of sexuality, it is important to be confident and self-assured sexually, before considering breast augmenting surgery. If one is mentally or sexually insecure, the slightest issue in relation to breast augmenting surgery may worsen the insecurities remarkably.

Truly, quite a lot of very young women between the ages of 18 and 21 undergo breast augmenting surgery. In these cases, a meticulous and serious plastic surgeon’s evaluation and advice is of utmost importance before going forward with surgery.

Breast augmenting surgery

Historically, both women, quacks and surgeons have attempted all kinds of different methods to enlarge women's breasts.

Training, corsets, creams, pills and suction devices have no beneficial effects . Surgeons' "experiments" have also been comprehensive, with glass balls, fluid silicone, polyvinyl sponges and so forth. The surgical methods often left patients with debilitating and permanent scar tissue.

The predecessor of the modern breast implants was invented in 1962 by two American plastic surgeons. They were inspired by blood bags in soft silicone and experimented with silicone bags filled with saline solutions or liquid silicone. Saltwater is completely harmless to the body, but saline implants feel more unnatural and firm. However, liquid silicone caused a lot of trouble when the implants ruptured. Liquid silicone causes scarring if it is released into the surrounding tissue, forming so-called "silicone granulomas". Since then, there has been experiments with other substances than saltwater and silicone without much success. The development in recent years have gone in the direction of "gummy bear"-like semicohesive silicone, which does not leak if the implant shell ruptures. On the first implant models, the surrounding silicone shell was smooth, but a rough surface has later been developed, which results in less scarring around the implants and partly prevents the implants' tendency to rotate.

Originally, all breast implants were "round", which means that they have a circular outline and that the highest point of the implant is positioned right in the center of the implant. For that reason, it does not matter how the implant rotates after being put in. Anatomical implants were originally developed for breast reconstruction on women who had lost their breasts to breast cancer. However, the anatomical implants created new possibilities for tailoring of a breast augmentation surgery to the individual woman. The anatomical implants are thus gaining more and more popularity also within the field of cosmetic surgery.

Today, the majority of implants in use are silicone implants containing semicohesive silicone. The semicohesive silicone is divided into 3 degrees of firmness: amongst these,

degrees 2 and 3 are the most common. Degree 2 is often used in round implants and is a little softer than degree 3, which is used in most anatomic implants. Few surgeons still recommend saltwater implants or implants with a core of silicone and an outer layer of saltwater.

Whether to use round or anatomical implants in a cosmetic breast augmentation depends on the surgeon and on the patient. Currently an equal amount of round implants and anatomical implants are being used for cosmetic breast augmenting surgery. The round implants have been on the market for many years, and many plastic surgeons have gotten used to working with them. The round implants are cheaper and the plastic surgeon and the patient will not have to worry rotation of the implant. It is possible to achieve a ”natural” result with round implants if the patient herself has enough breast tissue to camouflage the round shape.

Before the semicohesive silicone, the round implants took on an ”anatomical” shape when the women stood tall, but currently semicohesive silicone is also used in most round implants. Round implants come in several different projections (thickness) for each diameter. This provides each individual woman several options. Anatomical implants provide far more options to customize the breast augmentation to the individual woman, with some suppliers offering elliptical (short) and or oval (tall) implants. Furthermore, there are different options for projection (thickness). Thus, there are anatomical implants that would suit a shorter women with slightly sagging breasts, and completely different implants that are well-suited for a tall slender woman with very little breast tissue. The anatomical implants produce a more natural result for the women who do not have a lot of breast tissue and the cleavage becomes more natural. On the other hand, the anatomical implants are firmer than the round implants, as they are often come in slightly more cohesive silicone.

There are several manufacturers of breast implants. Three major manufacturers supply the majority of the Danish market: Allergan produces Natrelle Style 410 and 510 (anatomical) and Inspira Style 110, 115 and 120 (round), offering a large variety of implants. Natrelle is approved by the strictest medical regulations under the American Federal Drug Administration (FDA), which automatically grants the implants European CE-approval. Mentor produces Contour Profile Gel (anatomical) and Siltex (round) implants. They also have a wide selection and the implants are also FDA-approved. Eurosilicone produce Matrix (ana-

tomical) and round implants. The semicohesive silicone is the same as in all the suppliers mentioned above, but Eurosilicone is only approved by the more lenient European control system, the so-called CE-approval.

In addition to these three large suppliers of the Danish market, there are several smaller suppliers offering CE-approved implants.

Which implants should I choose?

Previously, the implants were chosen in accordance with the woman's wishes by simply putting round test-implants in a bra until the desired volume had been found. This method is still in use, but serious plastic surgeons take several more aspects into consideration when advising the patient in choosing her implants. The following aspects can influence the choice:

- The woman's wishes for size
- The woman's wishes for shape
- The woman's wishes for cleavage
- The woman's actual breast size
- Sagging or looseness of the breasts
- Natural width of the breasts
- Width and height of the chest
- The breasts' placement on the chest wall
- The body's proportions

With the many different implants available, it is possible to ”customize” a breast augmentation to the individual woman. This is called “Biodimensional Breast Augmentation”. The plastic surgeon measures the chest and the existing breast, evaluates sagging of the breasts and skin looseness and determines the natural demarcations of the breasts.

Afterwards, the woman is introduced to the implants that best respect her measurements

and the natural demarcations and limits of the breasts. Within these options, the woman can choose between a smaller or larger implant and decide on implant shape. It is advised against to choose implants that do not respect the natural limitations of the breast, in other words, disproportionally large implants, partly because of the increased risk of causing nerve damage and partly because of issues associated with very heavy or large breasts.

More mature women are often recommended to supplement a breast augmentation with a breast lift (see chapter on breast lift), if there is a lot of looseness or sagging of the breast. A breast lift is far superior to choosing disproportionally large implants to compensate for skin slackness.

Placement of scars

Implants can be put in from 4 different points of access.

The most common is a 5 cm incision in the fold under the breast (inframammary fold). With this incision, it the intension to hide the scar in the natural fold under the breast. This point of access gives the surgeon the best overview and allows for a relatively long scar, which is sometimes necessary when using anatomical implants. When the incision is made along the lowermost border of the pigmented area around the nipple (the periareolar area) the scar is hidden in the natural transition from the pigmented skin and the normal skin. From this point of access the risk of damaging the sensory nerves of the nipple is higher. Access through the armpit (transaxillary access) has the obvious advantage that the scar is not placed on the breast. Conversely, the surgeon has a very limited overview, and in general this point of access is not used for anatomical implants. Finally, it is possible to perform a keyhole surgery through an incision in the belly button (transumbilical). This is only an option when using saline implants, which are filled after they have been placed in the breast through a long tunnel under the skin from the naval and up to the breast. This type of surgery is only popular in the US, where using silicone implants for cosmetic surgery has not been permitted since 1992.

Muscle cover

The breast implants can be placed under the breast muscle (submuscular placement) and under the breast glands (sub-glandular placement). However, the lower part of the implant is always placed directly under the gland tissue, and today the designation Dual Plane (two planes) is used about the sub-muscular placement. Traditionally, placing the implants under the gland was more common. With this technique, the advantage is that the implant follows the gland tissue in any movements and a stronger direct effect on the gland tissue is achieved, if the breast has slight looseness or sagging. The disadvantages are that the upper edge of the implants can more easily be seen and felt and that implants' weight contribute to any breast sagging.

Today, the Dual Plane-placement is the preferred technique, with implant placement under the breast muscle. The advantage is that the breast muscle hides the upper edge of the implants and functions as a sort of interior bra. On the other hand, the implants move when the breast muscles does, which causes more pain in the period immediately after the surgery. The plastic surgeon can vary the degree of muscle cover, so that women a more breast tissue or loose breast tissue have less muscle cover and thus a slightly increased effect on the gland tissue. Dual Plane I describes maximal muscle cover and Dual Plane III describes minimal muscle cover.

A third option is placing the implants under the muscle lining (subfascial). In this procedure a pocket is made under the very thin membrane across the breast muscle giving a result that is somewhat in between the two previously mentioned methods.

First consultation

During your first consultation, the plastic surgeon will consult with you based on your wishes and expectations to the surgery in regards to possibilities and limitations. If you are a good candidate for a breast augmentation surgery, the plastic surgeon and you will determine what type of implant and what type of access point is best suited for you. You will receive information about what is realistic to expect after the surgery and what consequences and risks the surgery may entail.

The plastic surgeon will assess your overall health and whether it is necessary to draw blood samples or any further examinations before the surgery. Your breasts are meticulously photographed for “before and after” photos, if the operation is eventually carried out.

As a private patient you have the right to bring an assessor with you to your consultation, and we advise you do so. This provides you with an opportunity to discuss pros and cons for the surgery even after you have returned home. Danish legislation on “cosmetic treatment” requires that you wait a minimum of seven days from your first consultation before you can make an appointment for the desired surgery. This serves to protect you by preventing any impulsive or rash decisions to undergo cosmetic surgery.

The surgery

Breast augmenting surgery is commonly performed under full anesthesia and hospitalization. The new Danish law on cosmetic surgery requires hospitalization for a minimum of 6 hours, so that the patient can be monitored for any signs of post-op bleeding. The individual plastic surgeons have very different attitudes towards using pre-op medication, pain-relieving treatment, bandaging and rehabilitation.

At Printzlau Privathospital, we are far keener on using anatomical implants placed under the muscle and have taken a special pain-relieving treatment into use: The placement of a small pain-catheter during the surgery, from where local anesthesia can be administered during the day following the surgery. The majority of surgeons treat post-operative pain with combination of milder pain-relieving drugs, which affect the tissue, and stronger prescriptions which affect the brain. It is universally agreed that patients should try to get out of bed as quickly as possible after the surgery. Antibiotics are administered during the surgery in order to prevent infections. After the surgery we equip patients with a surgical bra which covers the entire chest and provides support to the breasts and serve to keep the implants in place. The bra is to be used both day and night for three weeks. When using anatomical implants a supplementary elastic bandage, the so-called ”mammae strap”, is used in order to prevent rotation. Suturing is performed with self-dissolving thread underneath the skin, a so-called intradermal technique, but we prefer to remove thread ends after 14 days regardless,

also for patients to have a short checkup making sure that everything has gone according to plan.

After surgery

Most patients can resume working and exercising 14 days after a breast augmentation, but 4 weeks must pass before doing any demanding physical activity. That of course means that women with strenuous physical jobs must wait 4 weeks until resuming work. It is important to keep the body and the arms active as muscle tension will otherwise contribute to pain and soreness. Movement is good, but straining should be avoided. Especially when the implants have been put under the muscle, the damage the surgery has caused to the muscle can be felt a good while after the surgery. The majority of plastic surgeons use a technique that leaves the minor chest muscle intact so that it can be rehabilitated and replace some of the decreased function of major chest muscle.

The scars must be protected from direct sunlight and tanning for a year, and it is recommended against using a bra with a wire for up to 3 months if the scars are placed under the breast.

A 3 months follow-up consultation is scheduled after the surgery, where the final result can be evaluated, as well as 12 months after surgery, where any signs of capsule formation (please see Complications) can be ascertained.

Subsequent effects

Implants are foreign objects in the body, and regardless of any lifetime guarantees, the implants and particularly the results do not last forever. Before the very first breast augmentation surgery, it is important to consider that there will be additional surgeries later in life. You might even say that the first surgery is the simplest, cheapest and the one that gives the best results. The subsequent surgeries will have to take into regard the scar tissue from previous surgeries as well as the aging of the breast and skin. Traditionally, plastic surgeons recommended that silicone implants were replaced every 10^{th} year because of the risks of leaks or ruptures. With the new semicohesive silicone implants, it is considered perfectly

reasonable not to replace the implants until the patient experiences issues or has complaints with the implants, exactly as it has always been the case for saline implants. Nonetheless, one should be aware that a breast augmentation does not last more than 10 years due to age-related changes in the body.

The implants block normal x-rays. This means that examining the breasts for breast cancer is compromised. Women with implants cannot participate in regular screening programs for breast cancer, but instead they can ask their general practitioner for a referral to radiologist for a clinical mammography scan. Then, a doctor specialized in radiology will do a mammography as well as an ultrasound scan.

Most women describe a change in the sexual sensitivity of the nipples after breast augmenting surgery. Often times, sensation in the nipples disappears completely for a few days after the surgery, then the nipples can be hypersensitive for the several weeks before the sensation diminishes to a level of slight reduction of sexual sensitivity. The nipples' ability to harden and breastfeed typically remain intact.

Regardless of which of the three points of access has been used, the scars will be red and visible for the first few months after surgery. After 6-12 months, the scars lighten, leaving a thin pale scar. When the scars are still red they may also itch. Simple band aid treatment with breathable band aids can reduce itching and possibly prevent risk of hypertrophic scarring (please see Complications).

Complications

Bleeding

If there is any bleeding, it will typically occur within the first 24 hours after the surgery. The breast swells profusely and causes pain. It is often necessary to operate again, to stop the bleeding put the implant back in place.

Infection

There are three different types of infections after breast augmentation surgery with implants. One appears during the first week and is caused by bacteria that has come into the body during the surgery itself. The surgical precautions and required hygienic procedures are very strict, and antibiotics are administered intravenously during the surgery to prevent this. This type of infection is very rare, but when it occurs it calls for a new surgery to remove the implant. It is recommended to wait about 3 months before putting in implants again.

The second type of infection is more common. It is a superficial infection of the scar with redness and skin irritation occurring about two weeks after the surgery. This type of infection can be treated with antibiotics and wound care, and it is not necessary to remove the implant. An infection of this type may however spread inwards and affect the implant.

The third type of infection is a so called a slow infection. It typically involves bacteria that would not normally cause infections as they are part of our natural skin bacterial flora. Such an infection will cause swelling and redness in one of the breasts. If treated with antibiotics the infection will subside only to return once the antibiotic treatment is terminated. In this case it is also recommended to remove the implant and wait some months before putting in a new implant.

Loss of skin sensitivity

In most surgeries, some of the small sensory nerves of the skin are cut. This means that sensitivity is reduced in areas immediately surrounding the scar. For scars under the breast, it affects the area of the lower part of the breast, with scars along the nipple it affects the lower part of the pigmented skin area, and with scars in the armpit it affects the skin sensitivity in the armpit. The numbing will decrease over time as there are nerves nearby that can compensate for some of the lost sensation.

Larger sensory nerves to the nipple come from between the ribs, both inwards from the sternum and alongside the lateral side of the breast. In a breast augmentation there is risks of damaging these nerves regardless of the access point used. Relatively speaking, the bigger the implants the bigger the risks. If the nerves are merely overstretched, the reduced sensiti-

vity in the nipples will slowly return during the first 6 months after the surgery. If the nerves are severed, the sensitivity in the nipple will disappear permanently. That means that also the nipples' ability to harden disappears.

When breastfeeding, the sensitivity of the nipples is important. Sensory input from the nipple during breastfeeding functions as a signal for the breasts to produce milk, but the sensitivity also serves as a protection of the nipple, as the child might otherwise continue to breastfeed even if the nipple skin is worn down or damaged.

The breasts and especially the nipples are erogenous zones. When the nipples are stimulated, small muscles contract under the skin, and the pigmented area around the nipple becomes smaller and the nipples hardens. There is great individual difference of the sensual sensitivity of the nipples in women, and with that a big difference in how important sensitivity is to each individual woman's sexuality.

Hypertrophic scarring

Some have a tendency to produce a lot of scar tissue after surgeries: So-called hypertrophic scarring. All scars are red and swollen during the months after the surgery, but with hypertrophic scarring, the scars remain red and swollen for more than a year after the surgery. It is aesthetically displeasing, and the scars can be itchy and sore. The scars are treated with band-aids for several months and may also be injected with steroid if the hypertrophy is severe. In rare cases, a disfiguring scar may be surgically corrected.

Hypertrophic scarring is different from keloid, which is an inherent disease in which the scar tissue extends outwards from the scar and onto the operated area. Patients with this condition are advised not to have cosmetic surgery.

Capsule formation

The body forms a thin membrane of scar tissue around the implants. As long as the membrane is thin and flexible it cannot be felt or seen and does no harm. If this scar membrane thickens, the implants will slowly feel harder than they otherwise would have, it is referred to as capsular contraction. Usually, plastic surgeons will not operate again due to slight capsule

formation, but if the capsule thickens the implants will begin to change shape and may change position on the body. In that case, a new surgery has to be scheduled to remove or loosen the scar tissue before putting the implant back in place.

Implant rotation

A special complication with anatomical implants is implant rotation. Liquid or blood surrounding the implant can cause the anatomical implants to twist or rotate after the surgery. In rare cases a double capsule is formed, causing the implants to move and rotate back and forth. In both cases a new surgery is needed to remove the membrane of scar tissue and the put the implant back in place.

Breast augmenting surgery in the future

Temporary breast augmentation with hyaluronic acid filler is already available on the market. In this procedure, filler is injected under the breast gland, similar to a small round implant. The substance slowly dissolves over the course of a year. Some have been experimented with permanent fillers, but issues with scar tissue and ”wandering” of the material has prevented further usage. The advantage of common implants is that they can be removed again. Currently, there is a lot of experimentation with fat transplantation. In this procedure, fat is harvested from other areas of the body, and can be injected into the breasts with a special technique. So far, the experiences with this method have been promising for smaller breast augmentations in women who do not have a lot of breast tissue. It is still a cause of worry whether the immature cells (stem cells) that are transplanted with the fat cells may have a cancerous effect on the cells of the breast tissue.

Myths and prejudice

Bimbo prejudice

One of the most popular myths is that only a certain type of woman have breast augmentation surgery and that the women who have the surgery will never find that their breasts are large enough. The truth is that most women who choose to have a breast augmentation, are women who have very small breast or sagging breasts and only wish to have a moderately large and

natural bosom. The majority of plastic surgeons will not operate on women with a naturally large and firm breasts.

Cancer and connective-tissue diseases

Previously, people have worried that silicone implants could cause connective-tissue diseases and prevent early discovery of breast cancer. Now, so much scientific research has been published on the matter that it is assumed proven that silicone implants do not increase the risks of disease.

USA and silicone

Even though breast implants were invented in the US back in the sixties, it is in Europe and South America that plastic surgeons have the most experience with silicone implants. This is because silicone implants were banned in 1992 in the US, due to previously mentioned suspicions of harmful effects. Only in the recent years after much scientific research, silicone implants have been approved for cosmetic use by the US authorities again.

Exploding implants

Every now and then, tabloid papers will published stories about ”exploding breast implants”, often in relation to longer airplane travels. Both saltwater implants and the early silicone implants could rupture, but as the density of both saltwater and silicone is the same as in the rest of the body, there are no pressure gradients from the body to the implants. Figuratively speaking, breast implants can withstand what the body can withstand.

Massage

Previously, capsule formation was treated by squeezing the breast implants hard to crush the scar-tissue mechanically. This has proved unnecessary and possibly dangerous and is now recommended against. Conversely, it is still recommended to massage scars on the skin are still to soften them. Whether this has any true effect is doubtful. Previous methods and treatment regimes have contributed to the myth that breast implants ought to be massaged to prevent capsule formation. Supposedly, this may very well be enjoyable, but it has no preventative effect on capsule formation.