

Round Gel Breast Implants or Anatomic Gel Breast Implants: Which is the Best Choice?

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Abstract

Background Since their introduction in 1993, anatomic implants have been popularized by numerous surgeons, but very little literature compares the precise indications, advantages, and disadvantages between round implants and anatomic implants.

Methods A retrospective analysis was performed for all the patients who underwent breast implantation by the main author over a 15-year period. The number of implanted patients, the shape of the implants placed, the approach routes, and the placement plane were determined as well as the relationship between the shape of the implant and the approach route. The aesthetic results obtained were analyzed in detail based on the shape of the implant used.

Results Over a 15-year period, 932 patients underwent surgery for breast implants. During the first 6 years, only round implants were used, and during the last 9 years, both anatomic and round implants were used. A total of 787 pairs of round implants and 145 pairs of anatomic implants were placed. The indications based on the postoperative aesthetic analysis suggest the use of implants according to their shape.

Conclusions The use of anatomic implants is suggested for patients with significant differences in chest height and width measurements, for cases of significant mammary asymmetry, for patients with a small breast volume or a

prominent thorax, and for breasts with a significant deficit of inferior mammary volume or significant shortening of the breast. The authors recommend round implants for patients with a superior pole deficit or moderate breast pseudoptosis, for patients who have a breast that will cover the implant, and for patients who present with a small asymmetry.

Keywords Anatomic breast implants · Anatomic gel breast implants · Breast gel implants · Breast implants · Round breast implants · Round gel breast implants

Since the appearance of the current anatomic implants in 1993 from the McGhan Medical Corporation (currently Allergan, Santa Barbara, CA, USA), and their popularization by numerous surgeons [8, 10, 11, 13, 16], these implants have become a very important alternative for breast augmentation [8, 10, 11, 13, 14, 16]. During their more than 15 years of use, the advantages of these implants have been described [8, 10, 11, 13, 14, 16] as well as the experience of the surgeons who use them [8, 10, 11, 13, 14, 16, 17].

Reports describe the technique for placing anatomic implants, the special care to be taken with them [11, 15, 16], and their main disadvantages [1]. However, few clinical studies and case reports describe the experience of a single author using both round and anatomic implants, the advantages and disadvantages of both, or the specific indications according to the particular characteristics of each patient. Therefore, we present our analysis of 15 years' experience using breast implants, our first 6 years of using round implants exclusively, and our last 9 years of using both round and anatomic implants. We

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point out the factors that, according to our knowledge and experience, must be taken into account to decide which type of implant to use.

Materials and Methods

Women who underwent placement of breast implants over a 15-year period, from October 1993 to September 2008, were analyzed. All underwent surgery by the principal author. All the implanted patients during this period were included, with a special analysis of the type and shape of the implant used. A correlation was made between the results obtained, the implant used, and the specific characteristics of the patient's breast.

The choice for the type of implant to be placed was based on the implant's characteristics, the desire and specific indications of each patient, and the surgeon's recommendations. All the round implants used were the Poly Implant Prosthèse (PIP; Cedex, France) high and ultrahigh profile models, whereas the anatomic implants were of two brands: McGhan Medical Corporation model 410 in its various projection and height modalities using soft touch as well as high cohesive gel and Silimed (Silicone e Instrumental Médico Cirúrgico e Hospitalar Ltda. Rio de Janeiro, Brazil) natural profile. All implants placed were the textured cohesive silicon gel type.

The decision to use a McGhan or Silimed implant depended on the patient's anatomic characteristics. If the required implants involved measurements offered by Silimed implants, they was used. If specific height and width measurements were required by the measurements of the patient's thorax, McGhan implants were used. McGhan implants also were used for patients who required an anatomic implant with a projection different from the one provided by Silimed implants.

The plane of dissection and the approach were chosen according to the characteristics, desire, and specific indications for each patient. When no contraindication existed, the dual plane was the first choice for all patients. This plane was chosen as the first option because it provides a covering for the prosthesis in the upper portion by the major pectoral muscle and in the lower portion by the breast. When a special effect of the prosthesis was required over the breast, the subglandular plane was chosen.

The main indication for subglandular placement was tuberous breast deformity. This plane was chosen in the first years of the study when the subfascial plane had not yet been described [6]. After this plane of dissection was described, the subfascial plane was chosen instead of the subglandular plane.

All the patients included in the study were followed for a minimum of 3 months, with postoperative photographs

taken during the assessment. Patients with longer follow-up periods were re-photographed, and at that time, the aesthetic results were analyzed.

All the patients provided a preoperative clinical history, with laboratory tests consisting of hematic biometry, coagulation times, and blood chemistry. When necessary, periareolar trimming was performed to remove excess areolar skin. Results were analyzed with before and after photographs, correlating the results and satisfaction with the type of implant used and the anatomic characteristics of the thorax and breast.

Results

Over a 15-year period, from October 1993 to December 2008, 932 women ages 18 to 47 years (mean, 28.4 years) underwent surgery. During the initial 6-year period, from October 1993 to September 1999, only round, high- and ultrahigh-projection Poly Implant Prosthèse (PIP) implants were used. During this period, 306 pairs of round implants were placed.

In October 1999, we began to use anatomic implants (McGhan Medical Corporation and Silimed). Therefore, during the last 9 years, from October 1999 to September 2008, we have used both round and anatomic implants. During this time, 626 pairs of implants were placed, including 481 round pairs and 145 anatomic pairs. Of the 145 anatomic pairs, 83 (57%) were McGhan pairs and 62 (43%) were Silimed pairs (Table 1).

During the first 6 years, 160 submammary, 128 periareolar, and 18 axillary incisions were used, whereas during the next 9 years, 422 submammary and 204 periareolar incisions were used. Axillary incisions were not used during this period (Table 2). Of the 204 periareolar incisions used in the last 9 years, 161 were used to place round implants and 43 to place anatomic implants, whereas of the 422 submammary incisions used, 102 were used to place anatomic implants and 320 to place round implants. Therefore, of the 787 total round implants placed during the 15 years, 582 were introduced through submammary incisions, 332 through periareolar incisions, and 18 through axillary incisions (Table 3). Of the 145 anatomic implants placed in 9 years, 70% were introduced through submammary incisions and 30% through the periareolar approach.

Table 1 Number of implants placed

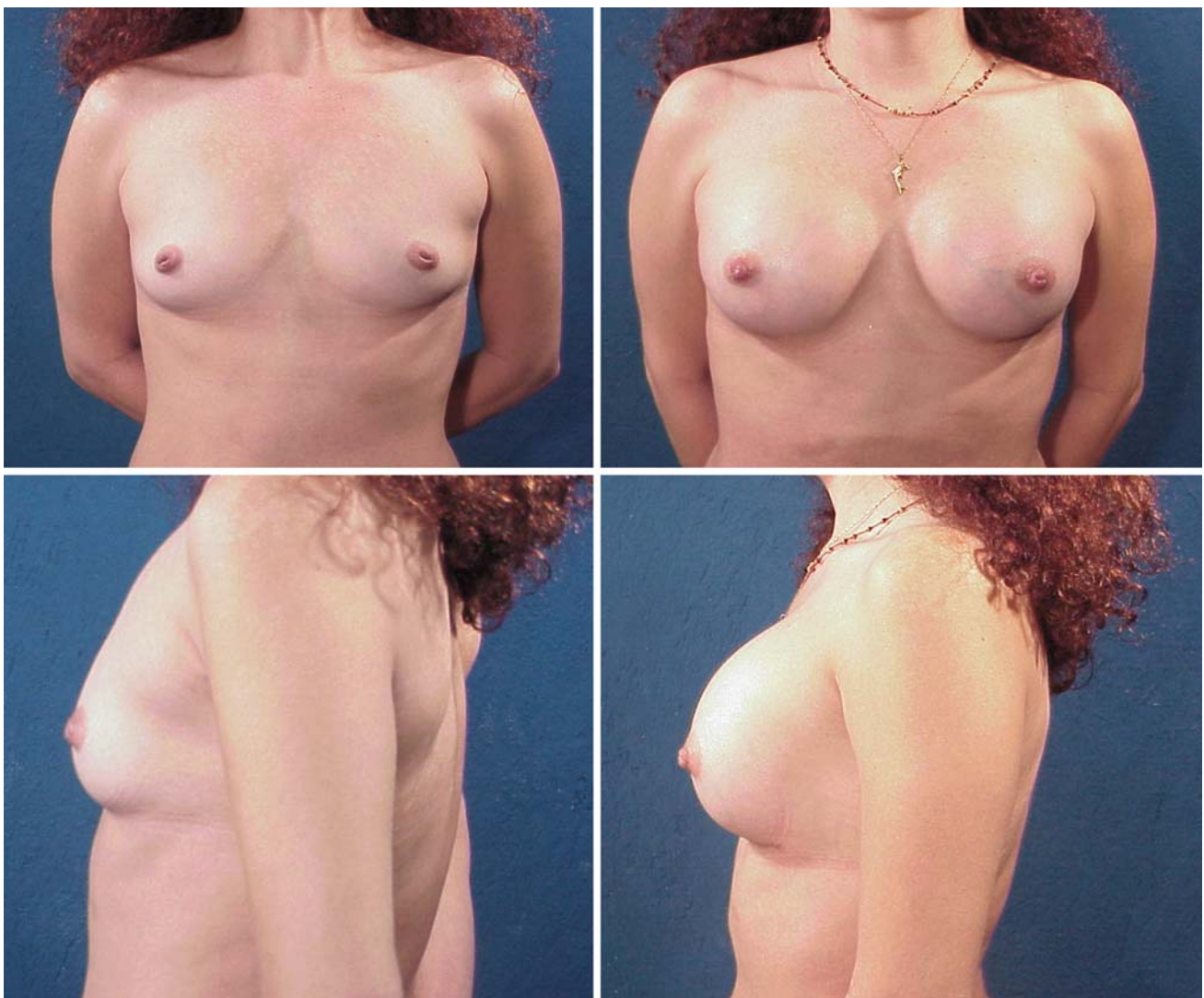
	First 6 years	Last 9 years	Total
Round implant	306	481	787
Anatomic implant	0	145	145
Total	306	626	932

Table 2 Types of approaches

	First 6 years <i>n</i> (%)	Last 9 years <i>n</i> (%)	Total <i>n</i> (%)
Submammary approach	160 (52)	422 (67)	582 (62)
Periareolar approach	128 (42)	204 (33)	332 (36)
Axillary approach	18 (6)	0 (0)	18 (2)
Total	306 (100)	626 (100)	932 (100)

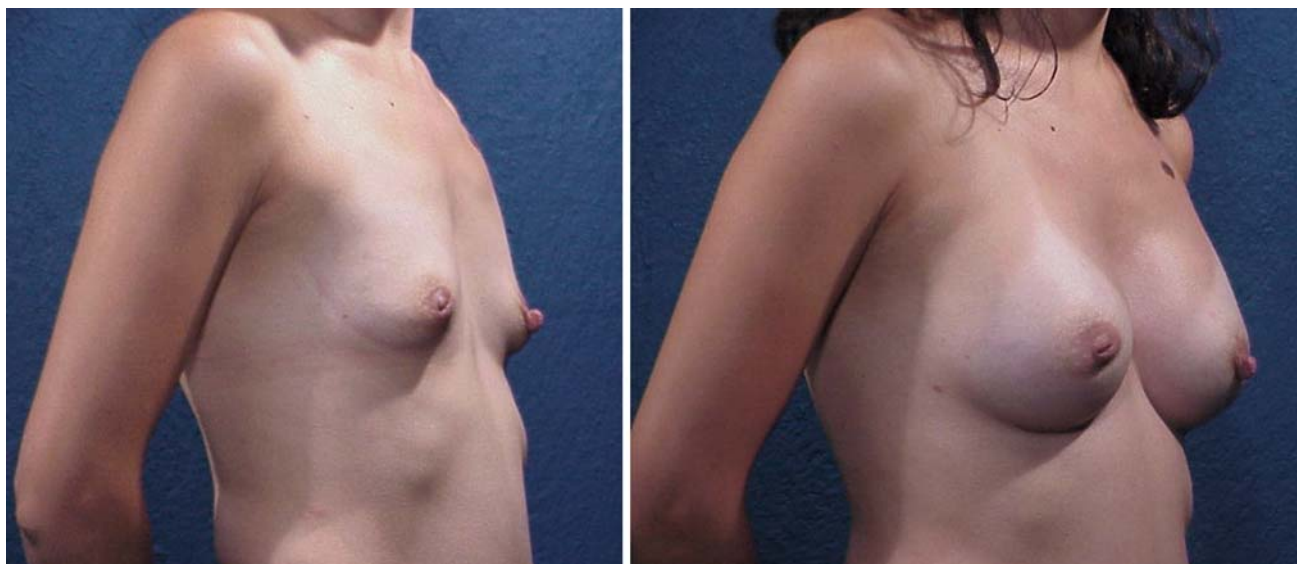
Table 3 Relationship between approach and shape of implants placed in the last 9 years

	Round implants <i>n</i> (%)	Anatomic implants <i>n</i> (%)	Total <i>n</i> (%)
Submammary approach	320 (76)	102 (24)	422 (100)
Periareolar approach	161 (79)	43 (21)	204 (100)
Total	481	145	626



Figs. 1–4 Case 1. A 26-year-old woman with placement of 310-ml high-profile round implants. The patient's thorax was wider than it was high. The measurements of the implant diameter matched the thorax width measurements. However, the diameter was too great in

height. Although it looked good in the frontal view, on the profile view, it looked too far projected at the superior pole, although the nipple-areola complex was well positioned in relation to the implant



Figs. 5–6 Case 2. A 22-year-old woman with a thorax higher than it was wide. She underwent placement of 320-ml anatomic implants. For patients with significant differences in height and width

measurements, the choice of an implant that will adapt to the differences in measurements gives very good results



Figs. 7–8 Case 3. A 30-year-old woman with placement of 290-ml high-profile round implants. The patient presented with similar measurements for both the height and width of the thorax. Round

implants placed in patients with similarities in height and width measurements give very good results because they adjust very well to the thorax without surpassing aesthetic limits

For 16 of the 332 cases in which periareolar incisions were used, periareolar skin needed to be trimmed to decrease the size of the areola, as in the case of tuberous breasts.

During the 15 years of the study, the placement plane was subglandular for 71 patients (7.6%) and subfascial in 39 cases (4.1%). In 822 cases (88.1%), it was a dual plane.

The results for both types of implants are shown in Figs. 1 through 20. The characteristics and particularities of the implants are analyzed. The results and patient satisfaction with the type of implant used are correlated with the anatomic characteristics of the thorax and breast. The care needed in choosing the type of implant is pointed out.

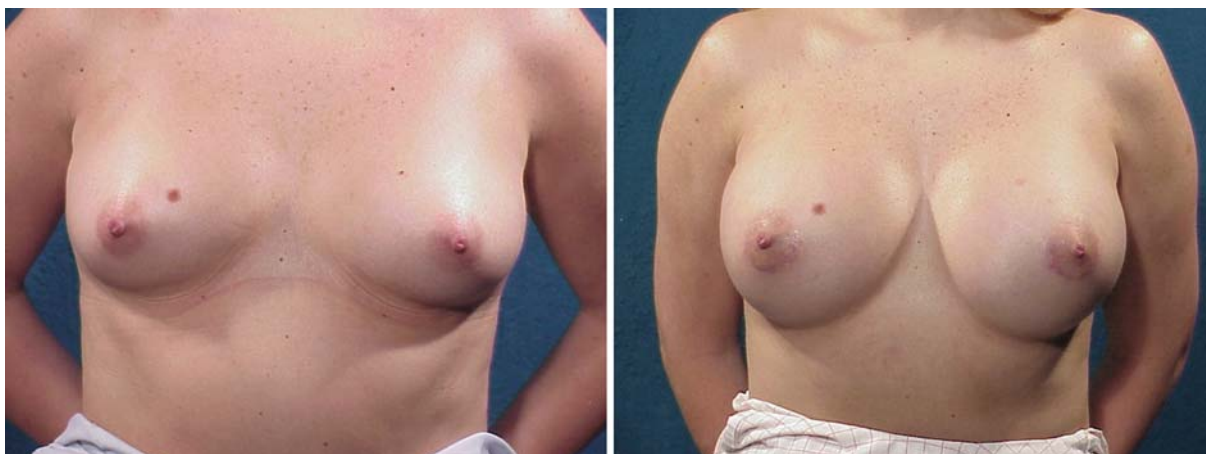
Discussion

Since their initial design by Cronin and Gerow in 1963 [5], breast implants have undergone numerous modifications and changes. These changes have been made primarily to improve quality, longevity, and naturalness. Several characteristics have undergone transformations. The cover has changed from a thick one initially to a thin one, later evolving to an antiexudative cover [18]. The surface also has evolved, going from a smooth surface to a textured one, or even to one covered with different materials, such as polyurethane [4, 5, 18]. The principal objective of these



Figs. 9–10 Case 4. A very thin 22-year-old woman with significant breast hypoplasia. In this type of patient, any implant placed will be quite obvious. Therefore, the recommendation is to place an anatomic

implant to obtain a more natural shape. A round implant will not provide as adequate a shape as an anatomic implant. The patient received 280-ml Silimed anatomic implants



Figs. 11–12 Case 5. A 28-year-old woman with moderate breast asymmetry. In this case and in cases with no major indication for anatomic implants, round implants give very good results. To compensate for the asymmetry, a 290-ml high-profile round implant

was placed on the left side and a 310-ml high-profile round implant on the right side. With this minimal difference between implants, the patient's small breast asymmetry was adequately compensated

changes was to avoid periprosthetic capsular contracture as much as possible.

Another variable that has undergone more modifications is the content of the implants. In the beginning, the content was silicon gel. Several years later, different substances were used as filler materials such as hydrogel, soybean oil, and saline solution [4, 5, 18], among others. Silicon gel has outlasted all the others. Initially a viscous silicon gel, it became a fine gel, and finally, the current adhesive gel, whose degree of cohesiveness also has been modified [4] to make it softer and more natural to touch.

Undoubtedly, one of the most important modifications of implant characteristics has been the design of the

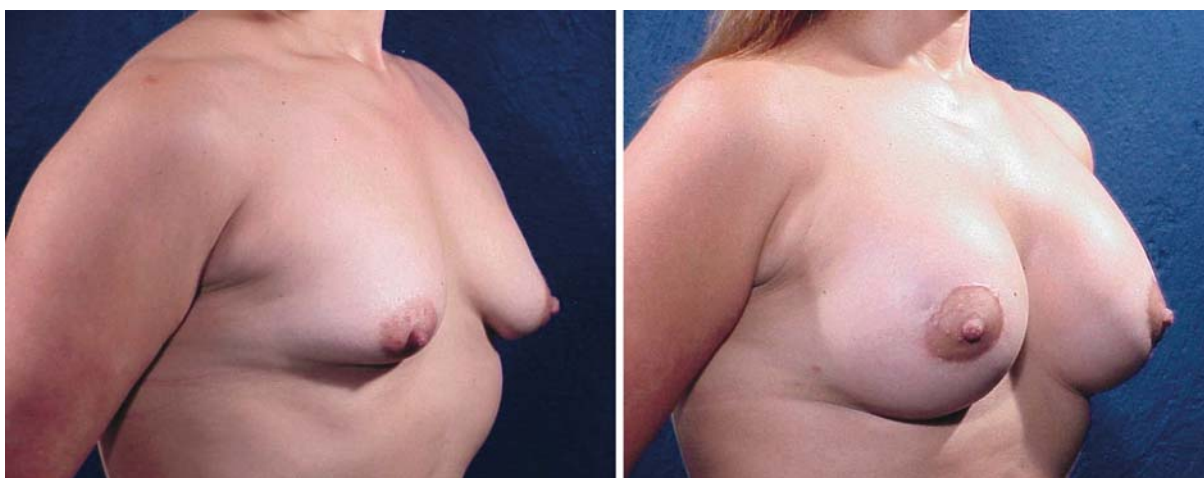
anatomic shape. These modified implants have become another alternative among the plastic surgeon's choices. Since their appearance and popularization by Tebbetts [15], numerous authors have used them widely, listing their characteristics, main advantages, and disadvantages [8, 10, 11, 13, 14, 16, 17]; the details of their placement; and the surgical technique for using them [11, 15, 16].

These implants were manufactured initially by McGhan Corporation in 1993 as model 410. Since then, several companies have gotten into manufacturing the anatomic implants. Companies such as Eurosilicone (Eurosilicone S.A.S., Apt, France), Silimed (Rio de Janeiro, Brazil), Mentor (Santa Barbara, CA, USA), and Nagor (Nagor



Figs. 13–14 Case 6. A 21-year-old woman, 6 years after surgery, with very significant breast asymmetry and a marked deficit at the inferior mammary pole. Both are pathologies very effectively resolved with anatomic implants. A 290-ml anatomic implant was placed on the right side and a 220-ml anatomic implant on the left side. Both implants were similar in height and width, but there was a

difference in the projection of each. The right implant projected 1.4 cm further than the left implant. These differences in projection were overcome with McGhan model 410 implants, and the other measurements were similar. The patient's submammary crease also was moved down to position the implant lower, and the supra-areolar skin was removed



Figs. 15–16 Case 7. A 29-year-old woman presenting with a very prominent thorax and an inferior mammary pole deficiency. In such a case, the alterations must be adequately compensated. An anatomic implant, whose greater projection is downward and less upward,

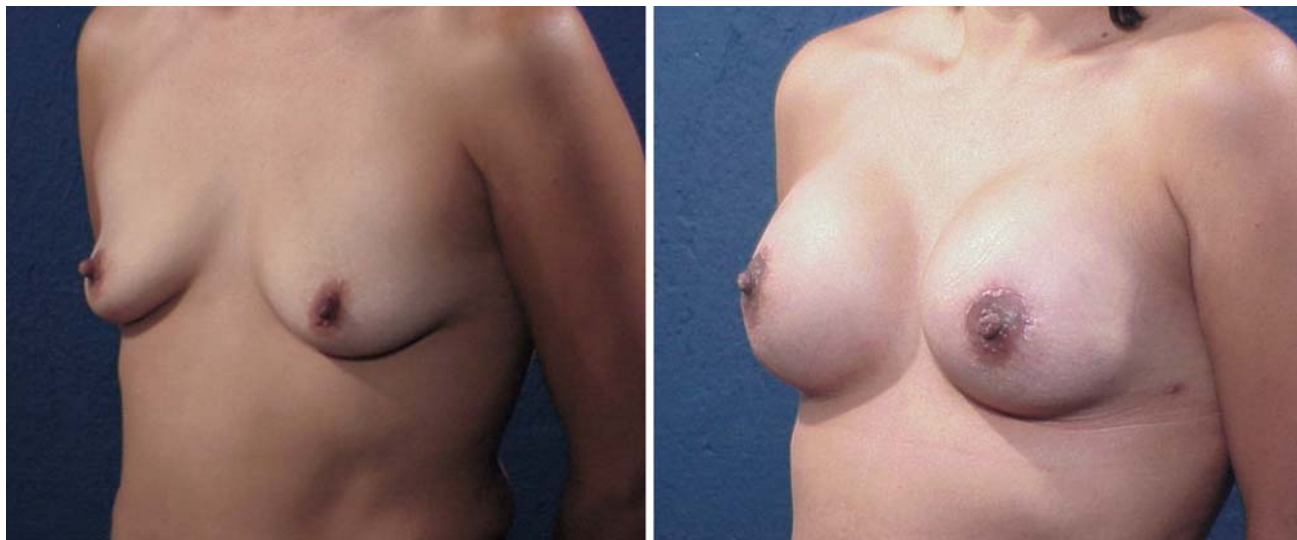
corrects this problem very satisfactorily. The patient received 395-ml McGhan model 410 FF implants, and the problem improved significantly. Periareolar skin resection was performed, and the submammary crease was lowered

Limited, Isle of Man, British Isles), among others, have created their own models and given them their own names. Silimed's Natural Profile, Mentor's Contour Profile, Eurosilicon's Vertex, and Nagor's Cogel Anatomical Contour are equivalent to McGhan's model 410, although the designs and measurements are not entirely the same.

One characteristic of these implants is that whereas round implants have only two variations in measurement, anatomic implants can have three measurement differences. With round implants, only the diameter and projection can be modified. Therefore, with implants that have

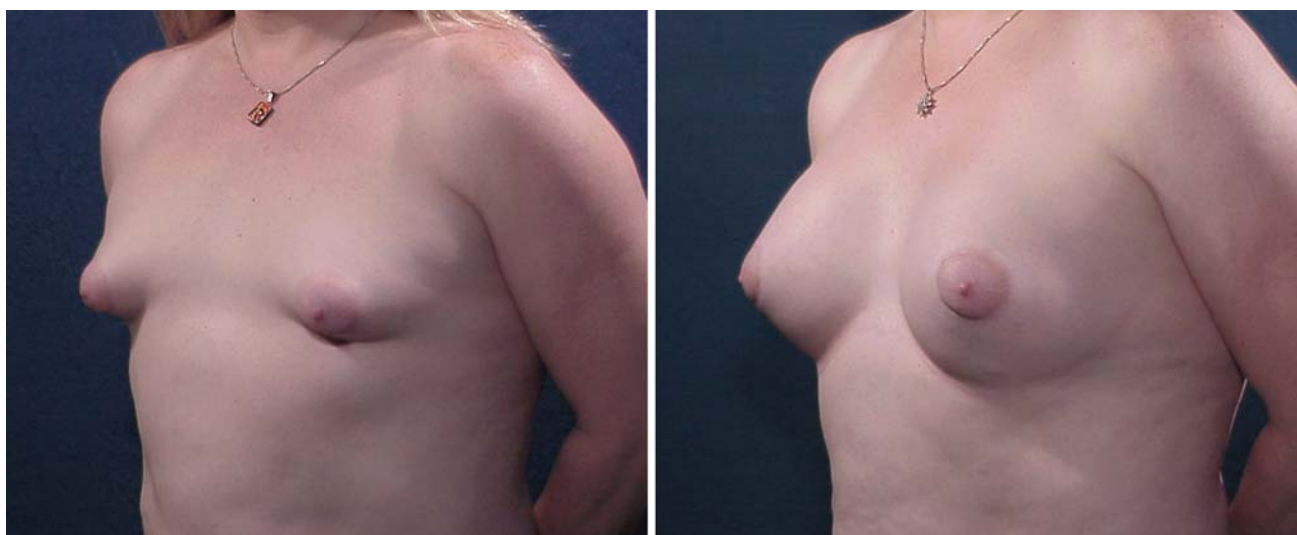
a specific base or diameter, the projection can be greater or less, resulting in low, high, or ultrahigh implants. This symmetric projection of round implants produces a marked projection in the superior pole of the breast.

By comparison, anatomic implants such as the McGhan 410 models can have differences in height, width, and projection, or they can be similar in height and width, but with a different projection, which is the peculiarity of anatomic implants such as the Silimed implants. However, the main characteristic of anatomic implants is their asymmetric projection, with greater projection in the



Figs. 17–18 Case 8. A 31-year-old woman with a significant deficit of the superior mammary pole. Breast pseudoptosis also was observed. For these cases, round implants are the best option. They

adequately fill in the deficient superior pole and notably improve the aesthetic look of the breast. The patient received 290-ml round implants, and the superior areolar skin was removed



Figs. 19–20 Case 9. A 35-year-old woman with a very short, tuberous breast. Anatomic implants are ideal for such a patient because they fill in the inferior mammary pole adequately and lengthen the breast more aesthetically than a round implant. The

patient received 450-ml McGhan implants, and the areola was trimmed in a circular manner to decrease its size and keep it from protruding

caudal portion and less projection in the cephalic portion. This peculiarity gives these implants a shape similar to a breast, which is precisely where their different names (e.g., anatomic, biodimensional, oval, natural contour) originate.

To maintain their specific shape, anatomic implants have as a primary base the consistency of their gel, which is a gel with different degrees of cohesiveness [4]. As some authors mention, an implant filled with saline solution does not keep its shape once it is placed [7], whereas *in vivo* studies have shown through tridimensional magnetic

resonance that both round and anatomic implants filled with cohesive silicon gel keep their original shape once they are placed [12]. Therefore, the use of cohesive silicon gel as a filler in anatomic implants is of primary importance in maintaining their main characteristics [4, 13, 14].

Although the patient's desire is an important factor in choosing the implant to be used [2, 9], only by knowing the characteristics and properties offered by anatomic and round implants can we make full use of the design's advantages. Spear et al. [14] designate anatomic implants

as ideal for large breasts positioned very low, whereas Hidalgo [8] expresses quite the opposite, recommending round implants for this type of breast. Baxter [2] states that extra-projected round implants are ideal for patients with a narrow thorax who want significant breast augmentation.

The same is true for patients who opt for periareolar pexy because it counteracts flattening of the breast [2]. We consider marked differences in the height and width of the thorax to be a primary indication for an anatomic implant because current concepts in selecting the size of a breast implant are based on dimensions not volumes.

In these cases, the best recommendation is to place an implant where the height and width of the implant can be chosen according to measurements of the thorax. A McGhan 410 implant allows adjustment of these differences, which is not possible with round implants. If a round implant is placed in a very wide but not very high thorax, based on the measurement of the width, it will fit the width very well but will be disproportional in height. This imbalance may produce an inadequate projection in the superior or inferior portions, which is not aesthetically ideal (case 1, Figs. 1–4). If a round implant is placed in a very long but not very wide thorax, taking as a measurement the height of the thorax, it may fit well with reference to height but would be too large in reference to the width, resulting in implants very close together and extending beyond the thorax. With this type of difference between height and width, anatomic implants give very good results (case 2, Figs. 5–6). However, if a proper proportion exists between the height and width of the thorax and the breast characteristics are suitable for it, a round implant provides excellent results (case 3, Figs. 7–8).

An important detail to consider in the choice of an implant is the preexisting volume of the breast because the gland itself is going to cover the implant and influence the result. Therefore, when the volume is very small or practically nonexistent, the final shape of the breast will be given solely by the breast implant contour, whereas if the breast volume is greater, it will cover the implant. Therefore, we agree that for very thin patients with little breast volume or patients who opt to have breast reconstruction, the anatomic implant is the best choice [5] (case 4, Figs. 9–10).

If the breast volume is moderate, often the final shape will be similar to the original shape of the breast no matter what type of implant is used. This occurs because the gland itself covers the shape of the implant (case 3, Figs. 7–8). It does not mean that the anatomic shape is better than the round shape for a patient who has no breast to cover the implant. It simply means that the shape is going to come from the implant placed, so we should always keep that factor in mind in making the decision. From the anatomic and aesthetic point of view, as plastic surgeons, we can

consider that the anatomic shape of thin patients with small breasts is the best option because it is the one that will most resemble a natural breast, although not all patients think the same way. Findings have shown that most plastic surgeons prefer natural superior poles, but most patients facing surgery prefer full superior poles [3, 9]. Round implants are preferred over anatomic implants by the large majority of patients [2].

Asymmetry of the breast is very adequately corrected with breast implants of different sizes. However, anatomic implants provide great advantages when the asymmetry is marked. For moderate asymmetry, a round implant that allows modification of the projection can be more than sufficient to compensate for the difference (case 5, Figs. 11–12), notwithstanding the fact that with greater asymmetry, it will be necessary to vary height, width, and projection in different degrees to achieve the greatest symmetry possible (case 6, Figs. 13–14). In these cases, measurement, analysis, and proper planning will be what provides the greatest possible index of success.

Specific thorax and breast alterations need to be considered in deciding on the implant to be used. Also to be considered in the choice of the implant to be placed is that round implants provide greater volume at the superior pole than anatomic implants. If a round implant is used, this effect will be more noticeable in patients with a thorax prominent in the superior portion, which in some cases may be quite anti-aesthetic [2]. This is a different situation than if an anatomic implant is used (case 7, Figs. 15–16) because with the latter implant, the situation will be largely dissembled. Therefore, because round implants have more filler at the superior pole, advantage should be taken of this with patients who have a deficiency in this portion of the breast. In this, we agree with Spear et al. [14]. As for the problem of a superior pole deficit, very common among women with prior pregnancies, in whom mammary pseudoptosis also may coexist, the round implant may find one of its best applications in this case (case 8, Figs. 17–18).

Another breast alteration in which the shape of the implant to be used is of vital importance involves a significant volume deficiency at the inferior pole of the breast. In this case, the largest amount of breast tissue is found in the superior portion. Therefore, an implant should be placed that will compensate for this deficiency. Obviously, the implant that best adjusts to these characteristics is the anatomic implant because its greater projection at the inferior pole will cause it to fill in more precisely where it is most needed (case 6, Figs. 13–14; case 7, Figs. 15–16; case 9, Figs. 19–20). If a round implant is used in this case, with filling in above as well as below, the previous anomaly will persist, only with a greater breast volume.

For cases in which the inferior pole deficiency is not so noticeable, but in which there is a high submammary

crease, an anatomic implant also is recommended because it will largely avoid an inferior irregularity (case 9, Figs. 19–20), as happens when a round implant is used. This irregularity results from the need to move the mammary crease lower in very short breasts because the area where the gland ends and the implant is not covered by the gland is noticeable.

The best way to make decisions in any activity is with knowledge. The same thing is true with any surgical technique and with the choice of an implant to be used in breast surgery. The only similarity that may exist between round and anatomic breast implants is the filler and the cover. Everything else is different. The two implants differ in design, shape, and projection. They also may differ in size. Therefore, their advantages and indications have to be different. And although the concepts are quite variable with regard to aesthetics, we can suggest indications for using each of these implants. One of the most important premises is that we should consider dimensions, not volumes, when making a decision about the type of implant to be placed. For a good choice, it is therefore essential to take measurements of the area in which the implant is to be placed and to analyze the anatomic characteristics of the breast.

Choosing an implant when one is unaware of alternatives is not justified, so the choice should always be based on providing the patient with the alternatives of both implants, showing her the advantages and disadvantages and suggesting the indication for the implant based on our knowledge as surgeons. Finally, however, the decision must always be shared [14] because our appraisal may differ greatly from the aesthetic concept of each patient.

Conclusions

We recommend the use of anatomic implants for patients with significant differences in the height and width of the thorax, significant asymmetry of the breast, little breast volume as in very thin patients or those requiring breast reconstruction, a prominent thorax, significant deficits of inferior breast volume, or very short breasts in which the mammary crease must be moved down. On the other hand, we recommend round breast implants for patients with a deficit at the superior pole, moderate breast pseudoptosis, a breast that will cover the implant, or a breast with asymmetry that is not too noticeable. However, the main indication that we have seen for round implants is the desire

and choice of patients for this type of implant because the concept of a round breast, full at the superior pole, is preferred by the majority of women who seek breast augmentation.

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