A NEW TECHNIQUE FOR VOLUME MEASUREMENT OF ASYMMETRICAL BREASTS*

Asimetrik Göğüs Hacim Ölçümleri İçin Yeni Bir Teknik

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Summary

Purpose: *Accurate measurement of the differences in volume between breasts is extremely important. To enable surgeons to base their estimation on an objective evaluation, we have developed a simple method based on an inflatable mammary prosthesis.*

Patient and Methods: *In our method we used a round expander and a commercial mammometer developed by Tegtmeier. The round expander was placed around asymmetrical and symmetrical breasts, through the suprapectoral or subpectoral method. The round expander was filled with saline to the level of normal breast volume. The volume of the saline used was measured and added to the expander tare. The total volume of the expander tare and the measured saline shows the difference in volume between the two breasts. We have used our method on 4 cases of asymmetrical and 10 cases of symmetrical* breasts.

Conclusion: *This method allows the measurement of the volume differences of asymmetric breasts and also helps the surgeon to estimate the size of prosthesis to be used in augmentation mammoplasty.*

Key Words: *Asymmetry; Breast; Mammoplasty.*

Özet

Amaç: *Asimetrik meme cerrahisinde memeler arasındaki gerçek hacim farkının ortaya konması son derece önemlidir. Farkın objektif değerlendirilmesi için şişirilebilir meme protezlerini baz alarak basit bir yöntem geliştirdik.*

Hastalar ve Yöntem: *Geliştirilen yöntemde Tegtmeier tarafından geliştirilen mamometre ve yuvarlak expander kullanıldı. Yuvarlak expander simetrik veya asimetrik memeye subpektoral veya subrapektoral yolla yerleştirildi. Bu expander normal taraf meme hacmi kadar serumla şişirildi. Kullanılan serum hacmine expander hacmi eklenerek iki meme arasındaki hacim farkı elde edildi. Bu teknik 4 asimetrik ve 10 simetrik meme büyütme hastasında kullanıldı.*

Sonuç: *Sunulan yöntemin meme büyütme ameliyatlarında kullanılacak protez boyutunu tahmin etmede ve asimetrik memeler arasındaki farkı hesaplamada cerrahlara yardımcı olacağını düşünmekteyiz.*

Anahtar Kelimeler: *Asimetri; Meme ; Meme ameliyatı.*

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Introduction

Measurement of breast volume is particularly important in asymmetry and augmentation mammoplasty. In an unsuccessful asymmetrical breast operation, neither the surgeon nor the patient is satisfied. There are several methods suggested by different authors (1-8), although there is still no commonly accepted standard method for measuring breast volume. Many surgeons still rely on visual estimation and external evaluation to measure the differences in volume between breasts and differences in volume between mammary prosthesis should be used.

To enable the surgeons to base their estimation on an objective evaluation, we have developed a simple method based on an inflatable mammary prosthesis. This technique is called the inner measurement method. This method allows the measurement of volume differences of asymmetric breasts to assist the surgeon estimate the size of prosthesis to be used in augmentation mammoplasty.

Patients and methods

Between 2001 and 2003, 14 patients underwent augmentation mammoplasties, using this new technique. Information concerning surgical management was collected by one surgeon after consultation of all medical records. We divided the techniques of measurement of breast volume into two. The first technique is called the outer measurement method. Our technique is called the inner measurement method. The outer measurement method comprises visual estimation, Archimedes principle and other methods (1-8). Two objects are needed for the application of the inner method, a used round expander (300-500 mL) and the commercial mammometer developed by Tegtmeier (3). An old expander can be gas sterilized for intraoperative use, as that of Tegtmeier. This expander can be used for every patient after gas sterilization. The round expander is placed on the asymmetrical breast through the suprapectoral or subpectoral method. Intraoperatively, this expander is filled with saline to the level of the other breast volume. The volume of the saline used is measured and expander tare is added. Expander tare is measured via Archimedes principle (7). The total volume of the expander tare and the measured saline show the difference in volume between the two breasts. To check the reliability of this method, we used our method on 4 cases of asymmetry and 10 cases of symmetrical breasts (figure 1,2). This technique is used in symmetric augmentation mammoplasty for asymmetric breast repairing. In addition, the brassieres which the patients would like to wear are gas-sterilized for intraoperative use. The expander is inflated after being fixed subpectorally or suprapectorally. After the inflating procedure, the patient is placed in the half-sitting position and the brassiere is worn. By increasing or decreasing the saline, breast sizes are equalized. The same method is used to equalize the size of the asymmetric breasts. The amount of saline is measured after providing the adequate size. By adding the weight of the container to this value, the volume of the prosthesis is determined. After the mammoplasty to correct asymmetrical and symmetrical breasts, for which we used our technique described above, breast volumes are equal in postoperative examinations. All of the patients undergoing breast surgery are summarized table1-2.

Discussion

The method developed by Tezel et al. (8) is the most reliable for breast volume measurement. Their method is also based on the principle of water displacement. This method can be used on patients who have minor but not major rib cage asymmetry, as stated in their article. Our method can be used for patients who have minor and major rib cage asymmetry. In the Schultz et al. method (7), the breast is submerged in a calibrated cylinder which is filled with water. However, they have a problem that stems from the patient's participation, i.e. the level of submergence depends on the patients, and this variation affects the accuracy of the measurement. This method is also uncomfortable for patients. Two preceding methods of determining volume using the brassiere were based on measuring the void between the brassiere and the breast (2,6). In this method, the filled bag is fixed between the brassiere and breast, which can put pressure on the breast, affecting the accuracy of the measurement. Outer measurements are not precise in sizing the breast for augmentation mammaplasty. In our method, the measurement is carried out by putting pressure under the breast. There is no pressure in outer measurement methods. Larger expanders may be more useful in patients who would like to have a larger prothesis. As an example, in a case where 250-300 cc prosthesis is to be placed, it is appropriate to use an expander with a volume of 300 cc. Expanders with the volumes of 250 to 300 cc may lead to incorrect results in measurements because of increased tensile strength. Thus, round expanders with larger volumes should be preferred in such cases. As a result, it would be appopriate to use two round expanders of different volumes. Both round expanders and gel prosthesis can resist the superimposed pressure equally, and the lateral expansion will be of the same degree. This also verifies the accuracy of our evaluation test. An additional test is performed to confirm this test. First, the round expander filled with saline is put on the digital weight scale and a 4 kilogram pressure is administered to its surface. Then, the height and circumference of the expander are measured. The same method is used in the gel prosthesis, also. No significant difference was recorded in both.

The advantages of the presented method may be summarized as follows:

1. It can easily be used in major rib cage asymmetry.
2.This method can be used in confirmation of all outer measurements.
3. The patients are not expected to participate in this procedure.
4.This method seems to be very objective particularly in augmentation mammoplasties.
5. Our method does not require the purchase of a special commercial device.

In conclusion, the application of our method has been extended to the perioperative assessment of volume differences between breasts, whatever the cause. After obtaining these measurements, it is easy to decide on the size of the prosthesis if only one breast is to be augmented or to decide on the sizes of the two different prosthesis in cases of bilateral augmentation. This method can be used not only for asymmetric breasts, but also in normal augmentation mammoplasty. It is a simple method and can be helpful for the inexperienced surgeon or one who only occasionally deals with asymmetric breasts.

Table I: Summary of patients undergoing asymmetrical breast surgery

Cases	Age	Estimate volume (mL)	Accurate volume (mL)	Difference volume (mL)	Prosthesis type
1	22	240	275	35	High profile textured
2	27	300	320	20	High profile textured
3	18	260	300	40	High profile textured
4	21	240	275	35	High profile textured

Table II: Summary of patients undergoing symmetrical breast surgery

Cases	Age	Estimate volume (mL)	Accurate volume (mL)	volume Difference (mL)	Prosthesis type
1	34	300	330	30	High profile textured
2	32	300	320	20	High profile textured
3	23	260	240	20	High profile textured
4	21	260	280	20	High profile textured
5	24	280	260	20	High profile textured
6	19	260	240	20	Medium profile textured
7	25	275	300	25	High profile textured
8	25	240	260	20	High profile textured
9	27	400	450	50	low profile textured
10	26	400	450	50	low profile textured

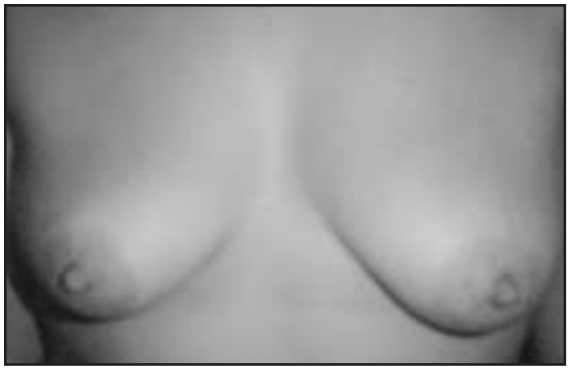

Figure 1 a-Preoperative view of normal breast.

Figure 1 b-Appearance of the 450 mL round expander on the left side.

Figure 1 c-Appearance of the 450 mL expander on the left side and 450 mL crystalline paragel mammary prosthesis on the right side.

Figure 1 d-Postoperative view of the patient.

Figure 2 a-Preoperative view of asymmetrical breast (Poland syndrome).

Figure 2 b-Postoperative view of the 350 mL crystalline paragel mammary prosthesis on the right side and 160 mL crystalline paragel mammary prosthesis on the left side.

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