Preliminary Report

Correction of Brassiere Strap Grooves with Fat Injections

Aesthetic Surgery Journal
2015, Vol 35(5) 561–564

DOI: 10.1093/asj/sjv007
www.aestheticsurgeryjournal.com
OXFORD UNIVERSITY PRESS

Selma Sönmez Ergün, MD; Emre Gönenç Baygöl, MD;
Reşit Burak Kayan, MD; İsmail Melih Kuzu, MD; and Onur Akman, MD

Abstract

Background: The size and weight of hypertrophied breast can cause both physical and psychological problems. Although the majority of these problems can be solved with breast reduction surgery, the particular problem of development of brassiere strap grooves on the shoulders due to the weight of the breasts cannot be corrected with this method.

Objectives: Breast reduction surgery focuses only on the increased dimensions of breasts: fullness of the thoracic wall lateral to the breasts, as well as the appearance of brassiere strap grooves, need to be taken into consideration to obtain a better upper body image. Therefore, we present a series of 10 female patients who were treated with fat injections for the correction of brassiere strap grooves.

Methods: Reduction mammaplasty and fat injections into the brassiere strap grooves were performed during the same session.

Results: Dramatic changes are obtained with judicious placement of fat into the bra strap grooves.

Conclusions: A more aesthetic and harmonious look can be obtained with using these combined aesthetic procedures in appropriately selected patients.

Level of Evidence: 4

Accepted for publication January 7, 2015; online publish-ahead-of-print May 4, 2015.

The size and weight of hypertrophied breasts cause such physical problems as mastalgia, upper back pain, posture problems, inframammary intertrigo, hyperpigmentation, and difficulty engaging in the activities of daily living. It is not uncommon for women with this condition to think that they are the object of unwanted attitudes and undesirable remarks, resulting in some psychological problems that may be added to the physical discomforts of large breasts. It is also difficult for these patients to obtain properly-fitting brassieres and clothing. For most patients, the extra financial burden due to expenditures for custom-made clothing is a significant problem.[1-3]

It has been shown in several publications[2-5] that reduction mammaplasty is the most effective treatment modality for relieving the majority of the symptoms associated with hypertrophied breasts. After reduction mammaplasty, patients' distorted body images returned to normal and patients expressed feelings such as enhanced femininity and sexual attractiveness.[2-5]

Autologous fat injection is a minimally invasive procedure for correcting contour irregularities and depressions. Fat transplantation has been started with Neuber,[6] and it has gone through various stages of development, such as the advent of liposuction and the development of an atraumatic technique for fat harvesting and placement. It has

From the Department of Plastic, Reconstructive and Aesthetic Surgery, Bezmialem Medical School, Bezmialem Vakif University, Istanbul, Turkey.

Corresponding Author:
Dr Selma Sönmez Ergün, Estonşehir 3, Mahalle, Ilgın Sokak CD Villa 7/2, Bahçeşehir, Başakşehir, Istanbul, Turkey.
E-mail: selmasonmezergun@yahoo.com

gained widespread application in the clinical practice due to its favorable outcomes.[6-8]

We present 10 female patients who were treated with fat injection for the correction of brassiere strap grooves.

METHODS

Fat injections were administered to correct the brassiere strap groove deformity in 10 female patients between January 2010 and December 2013. All of the patients had hypertrophied breasts, Grade III ptosis, and moderate (Type II) to severe (Type III) brassiere strap groove deformity.[9] All patients provided written informed consent.

Patients who had undergone chemotherapy, radiotherapy, or long-lasting steroid treatment or who had chronic blood abnormalities, connective tissue diseases, systemic metabolic disorders, body dysmorphic disorder, or anticoagulant treatment were excluded from this study.

Markings were made for the reduction mammaplasty and brassiere strap grooves (Figure 1A and C, and Supplementary Figure S1A and C). After the reduction mammaplasty, fat injections were administered into the brassiere strap grooves during the same session.

Autologous fat was harvested from the lower abdomen. After the lower abdomen was infiltrated with 100 mL of a solution of 0.5% bupivacaine with 1:200 000 epinephrine, a 2 mm stab incision was made in the inferior pole of the umbilicus. Then a 2 mm diameter, 26 cm long, single-hole blunt-tipped cannula (Trimed, Ankara, Turkey) was inserted, the plunger of the 10 mL syringe was gently retracted for

Figure 1. (A,C) Preoperative appearance of a 45-year-old woman with Type III ptosis and moderate brassiere strap groove deformities. (B,D) One-year postoperative appearance of the patient after breast reduction surgery and fat injection.

providing negative pressure, and a towel forceps applied the plunger throughout the suction maneuver to maintain the negative pressure. When the necessary amount of fat was obtained, the stab incision was closed using 5/0 monocryl stitches, and an elastic garment was applied to the lower abdomen.

Harvested fat was filtered under sterile conditions. The fat-filled injector was turned from upside-down, then a sterile gauze was placed at the tip of the injector and was positioned perpendicular to the tray. Sterile gas was utilized to separate the fat particles from fluids and oils. After filtration, concentrated fat particles were washed with 0.9% saline solution to eliminate any residual foreign substances and were transferred to 1 mL syringes.

Using 16-gauge needles, the autologous fat was injected into the affected areas with low volume for each pass via multi-tunnels, multi-planes, and multi-points. Light dressings were applied to the fat-injected areas.

The patients were asked to wear their brassiere straps away from the fati-injected areas during the first 6 months of the postoperative period or to wear a strapless brassiere for 3 months after the operation. Patients were examined at follow-up visits at 6 month intervals up to 36 months postoperation.

RESULTS

Patients aged 35 to 61 years (mean age 47.1 years) underwent one session of fat transfer. Brassiere strap grooves were slightly overcorrected, taking into consideration that the volume of injected fat would decrease over time. The volume of injected fat ranged from 25 to 40 mL with mean of 31.6 mL for both grooves.

Dramatic changes are achieved with judicious placement of fat to the brassiere strap grooves. Although potential complications of the fat injections include notable asymmetries, distortion, overcorrection, undergrafting, and infection,[10] we did not encounter any complications.

The mean follow-up period of the patients was 23.7 months (16–36 months). A portion of the injected fat decreased over time in the follow-up period, but brassiere strap grooves did not return to their original status and acquired shoulder contours that maintained a symmetrical appearance (Figure 1B and D, and Supplementary Figure S1B and D). There were no complaint about assymmetry, nodules, ecchymosis, or pain at the 6 month follow-up intervals.

Although the patients avoided wearing strapless and decollete clothing due to the unsightly appearance of their shoulder grooves and pendulous ptotic breasts in the preoperative period, they easily adapted to their new appearance and changed their clothing styles in the postoperative period.

DISCUSSION

Patients with heavy pendulous breasts experience limitations in their daily routines and in physical activities such as exercise and athletics. The inability to exercise may increase the tendency for obesity, which results in further deterioration in breast size and makes it difficult for these women to obtain properly fitting clothing and brassieres. For that reason, custom-made clothing and brassieres are necessary for most of them. Even though they wear custom-made brassieres, because of pressure exerted by the brassiere straps supporting the heavy breasts, uncomfortable and unsightly grooves occur in the shoulders of these women.[1,2,5]

The only remedy is reduction mammaplasty for hypertrophied breasts.[2,11] After reduction mammaplasty, there was a 93% reduction in symptoms and a 62% improvement in activity levels, resulting in highly satisfied patients.[2,11] Although reduction surgery reduces back, shoulder, and neck pain, it does not eliminate shoulder grooves.[2,11]

We had the opportunity to observe this situation in a patient who had nipple-areola necrosis and fat necrosis in the breasts after the reduction mammaplasty, because the patient was a heavy smoker. It is interesting that her shoulder groove deformity did not improve in severity with the reduction mammaplasty. The patient received follow-up consultations conservatively and, 6 months after breast correction, fat injections to the brassiere strap grooves and abdominoplasty were performed. Therefore, in our clinical practice, we noticed that the brassiere strap groove deformity would not improve with the reduction surgery without fat injection during a long follow-up period.

The patients were classified as Type I, Type II, and Type III for brassiere strap grooves according to the severity of their deformities.[9]

Correction of Type I (mild) deformity with fat injection may not be mandatory and may be performed mainly because of minor complaints by patients. However, fat injection is essential for the correction of Type II (moderate) and Type III (severe) deformities.

Autologous fat grafting is a safe and reliable option to correct these types of contour deformities, and the key to success is meticulous manipulation of fat grafts, and multitunnel and multi-plane injections to ensure maximum graft taking.[12,13]

Depending on the extent of the deformity, usually 25 to 40 mL of lipoaspirate is sufficient to correct brassiere strap grooves. Therefore, while more than one injection may be required to achieve an optimal outcome, overcorrections are made to the grooves to compensate for the inevitable volume loss and to avoid the need for additional fat-grafting sessions.

Better aesthetic outcomes can be achieved by abdominoplasty combined with liposuction or face lifting combined

with liposuction, fat injection, or blepharoplasty, etc. However, this is not yet the case with breast reduction. Traditional breast reduction surgery usually focuses on the increased dimensions of breasts and the fullness of the thoracic wall lateral to the breasts. Brassiere strap grooves also should be taken into consideration to obtain a better upper body image. Fat injection for correction of the brassiere strap grooves can be combined with reduction mammaplasty according to the patient's needs and aesthetic goals. By assessing the patients with regard to their aesthetic requirements, it is possible to identify individuals who will benefit from a combined aesthetic procedure.[14,15]

CONCLUSION

Fat injections were performed at the brassiere strap grooves in some cases because patients complained about the appearance of the shoulder contours and wanted to wear strapless and decollete clothing. Using fat injections during reduction mammaplasty confers the benefit of an improved aesthetic outcome in a single session.

Supplementary Material

This article contains supplementary material located online at www.aestheticsurgeryjournal.com.

Disclosures

The authors declare no potential conflicts of interest with respect to the research, authorship, and publication of this article.

Funding

The authors received no financial support for the research, authorship, and publication of this article.

REFERENCES

1. Aston SJ, Rees TD. Breast reduction and mastopexy. In: Rees TD, ed. *Aesthetic Plastic Surgery*, vol. 2. Philadelphia, PA: WB Saunders Company; 1980:903-953.
2. Collins ED, Kerrigan CL, Kim M, et al. The Effectiveness of surgical and nonsurgical interventions in relieving the symptoms of macromastia. *Plast Reconstr Surg*. 2002;109:1556-1566.
3. Glatt BS, Sarwer DB, O'Hara DE, Hamori C, Bucky LP, LaRossa D. A retrospective study of changes in physical symptoms and body image after reduction mammaplasty. *Plast Reconstr Surg*. 1999;103:76-85.
4. Blomqvist L, Eriksson A, Brandberg Y. Reduction mammaplasty provides long-term improvement in health status and quality of life. *Plast Reconstr Surg*. 2000;106:991-997.
5. Blomqvist L, Brandberg Y. Three-year follow-up on clinical symptoms and health- related quality of life after reduction mammaplasty. *Plast Reconstr Surg*. 2004;114:49-54.
6. Neuber G. Über die Wiederanheilung vollständig vom Körper getrennter, die ganze Fettschicht enthaltender Hautstücke. *Zbl Chir*. 1893;30:16.
7. Borkenhagen A, Röhricht F, Preiss S, Schneider W, Brähler E. Changes in body image and health-related quality of life following breast reduction surgery in German macromastia patients: a new tool for measuring body image changes. *Ann Plast Surg*. 2007;58:364-370.
8. Illouz YG. The fat cell "graft". A new technique to fill depressions. *Plast Reconstr Surg*. 1986;78:122-123.
9. Ergün SS, Gayretli O, Kayan RB. Brassiere Strap Groove Deformity: definition and classification. *Aesthet Plast Surg*. 2014;38:350-353.
10. Mentz HA, Ruiz-Razura A, Miniel LA. Correction of the bra strap shoulder Groove deformity in women. *Plast Reconstr Surg*. 2007;120:2122-2123.
11. Miller AP, Zacher JB, Berggren RB, Falcone RE, Monk J. Breast reduction for symptomatic macromastia: can objective predictors for operative success be identified? *Plast Reconstr Surg*. 1995;95:77-83.
12. Dabbah A, Lehman JA Jr, Parker MG, Tantri D, Wagner DS. Reduction mammaplasty: an outcome analysis. *Ann Plast Surg*. 1995;35:337-341.
13. Xie Y, Zheng DN, Li QF, et al. An integrated fat grafting for cosmetic facial contouring. *J Plast Reconstr Aesthet Surg*. 2010;63:270-276.
14. Mazzola RF, Cantarella G, Torretta S, Sbarbati A, Lazzari LPignataro L. Autologous fat injection to face and neck: from soft tissue augmentation to regenerative medicine. *Acta Otorhinolaryngol Ital*. 2011;31:59-69.
15. Ramirez OM. Full face rejuvenation in three dimensions: a "face-lifting" for the new millennium. *Aesthet Plast Surg*. 2001;25:152-164.