Donut mammoplasty in management of gynecomastia: general surgeon experience

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Background
Gynecomastia is benign enlargement of the male breast. Although treatment is not indicated in most cases, esthetic reconstructive surgery is commonly performed for psychological reasons. This clinical study discusses the outcomes of the surgical management of gynecomastia by subcutaneous mastectomy using the donut mastopexy technique in different grades of gynecomastia and assesses the morbidity and complication rates associated with the procedure.
Materials and methods
From January 2013 till January 2017, we operated on 20 patients with bilateral idiopathic grades 1, 2, and 3 gynecomastia by subcutaneous mastectomy using the donut mastopexy technique. Exposure was excellent with the circumareolar incision. Patients were followed for at least 6 months.
Results
Excised specimens were weighed and sent for histopathological examination. The mean weight of the resected specimen was 92±44 g (range: 38–280 g). One patient showed bilateral atypical hyperplasia on histopathological examination. All patients achieved good esthetic contour of the chest. Circumareolar scars were satisfactory for all patients. No wound infection, hematoma, seroma formation, or nipple–areola complex necrosis was seen in any of the patients Areolar sensation was diminished in one (5%) patient and recovered within 6 months postoperatively. The main disadvantage of the technique was the mild residual skin redundancy, which was noted in eight patients with grade 3 gynecomastia.
Conclusion
Donut mastopexy technique is indicated for grades 1, 2, and 3 gynecomastia. Circumareolar incision provides perfect exposure. It is considered to be less invasive, has minimal scarring, has low complication rates, and had good esthetic outcome. Moreover, it is oncologically safe through histopathological examination of excised specimens to discover pathological abnormalities and hidden malignancy.

Keywords:
circumareolar incision, donut mammoplasty, gynecomastia

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Introduction

Gynecomastia is a physiologic or pathological enlargement of the male breast [1]. Physiologic gynecomastia has three distinct age peaks. The first peak is within the first few weeks of neonatal life. The second occurs during puberty and the final peak is in older adulthood, usually after the age of 50 years [2]. Gynecomastia may be seen in 40–65% of adult males [3].

Pathologic gynecomastia can occur at any time when an imbalance develops in the androgen–estrogen plasma levels. This may be attributable to increased estrogen, decreased androgen, receptor defects, or an altered sensitivity of the breast to estrogen [4]. However, in most cases of gynecomastia, a cause cannot be identified, and the problem usually is idiopathic [5,6].

Careful evaluation of the affected patient still is essential before it is assumed that the gynecomastia is idiopathic and benign. A detailed history, thorough physical examination, and laboratory assessment should be performed to rule out any drug administration, neoplasm, urologic disorder, hormonal imbalance, liver disease, or malnutrition [7]. Gynecomastia does not require specific therapy except for the rare cases with disabling pain and tenderness [8]. Most patients request treatment for psychological reasons. The goal in treating these patients is resection of the abnormal tissue that restores the normal male

breast contour and minimizes scarring or residual deformity of the breast and nipple–areola complex [8,9].

Regarding surgery, no single technique is appropriate for all grades of gynecomastia [10] Several classifications are used for gynecomastia to define the choice of surgical technique [8,9,11,12]. Among these, Simon's classification, based on breast size and degree of skin redundancy, is commonly used. This classification divides gynecomastia into three grades: grade 1 (small enlargement, no skin excess), grade 2A (moderate enlargement, no skin excess), grade 2B (moderate enlargement with extra skin), and grade 3 (marked enlargement with extra skin) [9].

Surgery is planned depending on the grade and histopathology of gynecomastia. Webster's intra-areolar incision, periareolar or circumareolar incisions, Letterman's technique, and suction-assisted lipectomy are commonly used in the treatment of grades 1 and 2A gynecomastia [7,8,11]. Superiorly or inferiorly based pedicle areolar flaps and free nipple techniques are preferred for grades 2B and 3 gynecomastia [8].

The circumareolar donut approach is a relatively new technique that provides excellent exposure and postoperative scars in the treatment of grades 1 and 2 gynecomastia [13].

This study extends the role of the circumareolar donut approach in management of all grades of the gynecomastia including grade 3 and the clinical results of the technique.

Materials and methods

Between January 2013 and January 2017, we performed subcutaneous mastectomy using the donut mastopexy approach on 20 patients with gynecomastia. The mean patient age was 28.9±14 years (range: 22–75 years). The psychological embarrassment about feminine appearance was the major indication for surgery in 18 (90%) patients and tenderness in two (10%) patients.

Two patients had grade 1 gynecomastia, four had grade 2A gynecomastia, six had grade 2B gynecomastia, and eight had grade 3 gynecomastia according to Simon's criteria. Lesions were bilateral in all patients. All the patients received a diagnosis of idiopathic gynecomastia after detailed history, physical examination, and laboratory evaluation. A detailed informed consent was signed by all of the patients.

Operations were performed under general anesthesia in all patients. Patients were followed up for at least 6 months.

Surgical technique

Preoperative markings were made with the patient in a upright position. First, the midsternal line and the breast mold to be excised were marked. The circumareolar incision at the junction of the areola and skin was marked 4 cm in diameter, including the nipple and areola complex, and a second concentric circle (or even eccentric if the areola needs a lift) is marked outside the circumference of the original areola (width of 1–2 cm). Their medial limit is 10–12 cm from the midsternal line (Fig. 1). Circumareolar skin incisions were made (Fig. 2). The ring of skin between them is de-epithelialized, leaving intact dermis and hence the dermal vascular plexus to nourish the nipple and areola (Fig. 3). A hemicircumferential incision from 3 to 9 o'clock position is made along the outer edge of the de-epithelialized ring, through dermis and subcutaneous

Figure 1

Preoperative marking.

Figure 2

Incision of two concentric circles.

tissue, to gain access to the breast (Fig. 4). The breast tissue is dissected and freed from the pectoral fascia. An adequate thickness under the nipple was left to avoid areolar retraction or ischemia. Removing proper amount from each side was done to obtain symmetricity. No breast tissue was left over the prepectoral surface. A suction drain was brought out through the anterior axillary line incision and a purse–string suture (Fig. 5) to the outer dermal circle adjusted to 4-cm areolar diameter with 3/0 polydioxanone (PDS) and skin closure by 4/0 Monocryl subcuticular sutures were done. A light dressing was applied postoperatively.

Results

Excised specimens were weighed and sent for histopathological examination. The mean weight of the resected specimen was 92±44 g (range: 38–280 g). One patient showed bilateral atypical hyperplasia on histopathological examination.

The method described yields excellent shape, symmetry, and minimal unapparent scars. Areolar sensation was diminished in one (5%) patient and recovered within 6 months postoperatively. Good chest contour was achieved, and good patient satisfaction rate were noted in all patients (Figs 6–8).

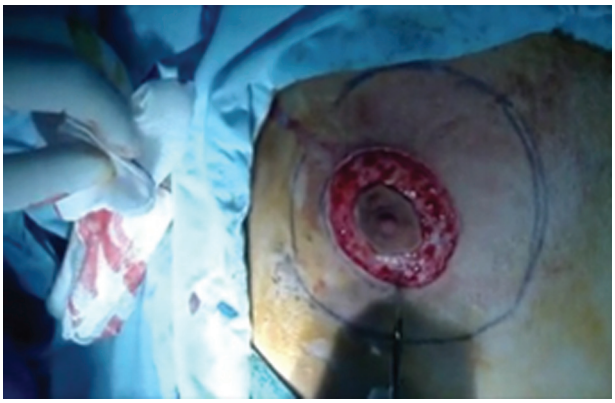
There were no major complications such as infection, hematoma, seroma, or nipple–areola complex necrosis. The main disadvantage of the technique was the mild residual skin redundancy, which was noted in eight patients with grade 3 gynecomastia. This redundancy, however, was never severe enough to require a secondary procedure and improved after 6 months of follow-up. Moreover, all patients were satisfied with the final result.

Discussion

Various incisions and techniques have been described for the treatment of gynecomastia. Among these, Webster's intra-areolar, periareolar, and circumareolar incisions are the most commonly applied.

The donut mastopexy using the circumareolar incision is a relatively new technique [8]. It provides excellent results not only for grades 1 and 2 cases but also for

Figure 3

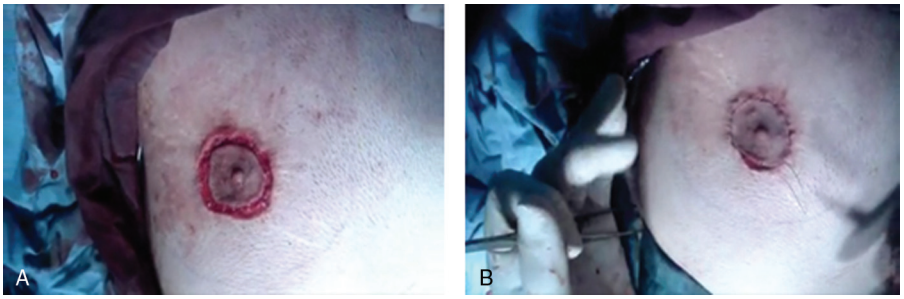


Donut de-epithelialization.

Figure 4

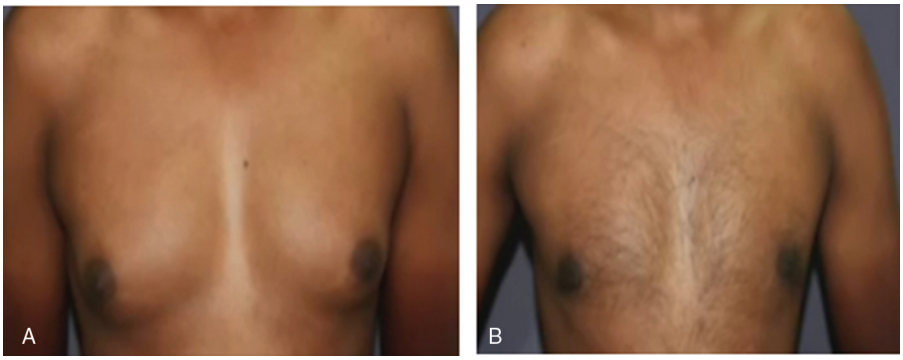
Access for resection.

Figure 5



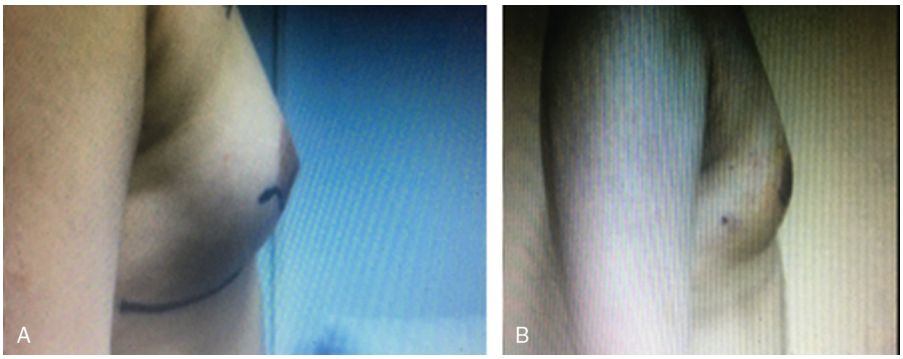
Wound closure through a purse–string and subcuticular fashion.

Figure 6



(a) Preoperative view and (b) postoperative view after 6 months.

Figure 7



(a) Preoperative view and (b) postoperative view after 6 months.

Figure 8

(a) Preoperative view and (b) postoperative view after 6 months.

grade 2B gynecomastia because the technique allows skin excision and areola reduction [13,14].

In our study, we extended the role of donut mastopexy technique to include patients with grade 3 gynecomastia with severe skin redundancy and the need for areolar lift.

Surgical exposure with the circumareolar incision is excellent, and the risk for postoperative hematoma formation is minimal. It should be noted that in cases with redundant skin, simultaneous medialization and cranialization of the nipple–areola complex completing the semicircular incision to a periareolar de-epthelialization were useful.

This is comparable with study by Aslan *et al.* [15] who suggested a modified surgical access that uses a W-shaped periareolar–transareolar–perithelial incision to provide wide exposure of the resection area and to facilitate nipple–areolar reduction in advanced stages.

En bloc resection of the breast tissue through avascular planes offers several advantages, such as the perioperative blood loss is minimal; hemostasis is easy; and the risk for leaving residual breast tissue, which may lead to a persistent gynecomastic appearance, is less.

The major concern with the exclusive use of liposuction is the lack of histopathological analysis of the resected tissue. Even though it is technically possible to submit tissue pieces from liposuction to a histopathological analysis [16], this has been performed only rarely, and the results are difficult to interpret owing to tissue damage and consistency.

The histopathologic finding in the present study was one patient with bilateral atypical ductal hyperplasia, which is accompanied by increased rate of associated neoplasia [17]. Bilateral atypical ductal hyperplasia in gynecomastia specimens has been described by other authors [18]. Nevertheless, it is important to emphasize that there is no convincing evidence linking gynecomastia with increased incidence of male breast cancer [19].

In contrast to gynecomastia, breast cancer in men has a peak at 71 years, and it usually presents as a painless lump or nipple retraction [19]. However, this does not eliminate the need for a histological examination of the resected tissue [20–23]. Voulliaume *et al.* [20] report a case in which a patient received liposuction for 'gynecomastia', which later proved to be established case of male breast cancer. They point out the problem of dissemination of malignant cells into healthy tissue during the liposuction procedure [20]. Other authors have also described that breast enlargement in young men is not always benign gynecomastia: malignant tumors such as breast carcinoma may be present in the midst of florid gynecomastia, even in a young patient [21]. DeBree *et al.* [22] describe a 22-year-old man initially diagnosed with unilateral gynecomastia, in which histological analysis revealed an invasive ductal carcinoma of the breast. In a recent publication, Staerkle *et al.* [23] report on synchronous bilateral ductal carcinoma *in situ* in a young man presenting with bilateral gynecomastia. Wadie *et al.* [24] describe a case of a 16-year-old boy with bilateral gynecomastia, in which the histological workup revealed a ductal carcinoma *in situ*.

These data emphasize the need for a histological analysis because gynecomastia may be harboring a neoplasia. Liposuction as an exclusive procedure should be limited to cases of pure pseudogynecomastia, in which preoperative assessment shows the presence of an isolated lipohypertrophy with no sign of glandular enlargement.

In our study, no wound infection, hematoma, seroma formation, or nipple–areola complex necrosis was seen in any of the patients. Areolar sensation was diminished in one (5%) patient and recovered within 6 months postoperatively. The main disadvantage of the technique was the mild residual skin redundancy, which was noted in eight patients with grade 3 gynecomastia. This redundancy, however, was never severe enough to require a secondary procedure and improved after 6 months of follow-up. All patients were satisfied with the final result.Numerous techniques to treat grade III gynecomastia have been described. Rai [25] recommends two stages for postweight problems with significant ptosis, whereas Ward and Khalid [10] technique ends with a periareolar scar and transverse medial and lateral extension. Presented study reveals lower complication rate than Courtiss [26] who reviewed 101 patients who underwent subcutaneous mastectomy for gynecomastia.

Our results should also be comparable with the series by Steele *et al.* [27] in 2002, where the most frequent complication of subcutaneous mastectomy was postoperative bleeding and hematoma or seroma formation. This finding is consistent with the results of other series that have described an overall complication rate of up to 28% in all patients [27,28].

Conclusion

The subcutaneous mastectomy using donut mastopexy technique is indicated for grades 1, 2, and 3 gynecomastia. Circumareolar incision provides perfect exposure. It is considered to be less invasive, produces minimal scarring with a low complication rates, and shows good esthetic outcome. It also could be considered oncologically safe through histopathological examination of excised specimens to discover pathological abnormalities and hidden malignancy.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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