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An efficient method for the correction of iatrogenic symmastia: A case series

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ABSTRACT

Background: Symmastia is a medial confluence of the breasts, produced by a web of skin and fat merged across the midline, that generates the disappearance of the intermammary sulcus. Apart from the rare congenital cases, this condition is usually a result of technical complications during breast augmentation surgery.

This article describes a simple and reliable method for correcting symmastia.

Methods: From November 2006 to June 2015, we treated 10 patients with acquired symmastia who had previously undergone an implant-based reconstruction. We performed a crescent-shape medial capsulectomy and we then performed an adequate and resistant closure with a substitute device, consisting of a Tuohy epidural needle and polydioxanone sutures, which are easily accessible and inexpensive. The process outcome was successful and resulted in a normal cleavage between the breasts.

Results: Mean follow-up was 24 months. We haven't observed any recurrence of symmastia to date in this study. One postoperative hematoma and one seroma occurred. All ten patients achieved acceptable results through the procedure.

Conclusion: Our pericapsular Tuohy technique for medial closure of the pocket is a practical and efficient substitute to traditional capsulorraphy and provides reliable and reproducible results.

1. Introduction

Symmastia, the medial confluence of the breast tissue across the midline, is occasionally encountered in clinical practice, but relatively uncommon. In observations, this condition presents itself as web of skin, fat and tissue merged together, resulting in a reduction of the intermammary sulcus. Two forms of symmastia are observed: congenital and acquired. While congenital symmastia is a very rare condition, acquired symmastia is fairly common and it's usually a consequence of bilateral breast augmentation, whereby overaggressive dissection of the medial aspect of the implant pocket produces a communication of both implant pockets across the midline [1–3].

Significative hypertrophy of the breast could be associated with symmastia due to the similar appearance of the alterations. Clear cases of macromastia can be treated with presternal skin and gland resection; reduction mammoplasty techniques are also viable procedures for this case [4].

Gradual detachment of the presternal skin from its underlying attachment may be caused by accidental or overly aggressive medial dissection, inducing an anomalous shifting, hence an abnormal communication between the pockets placed over the sternum.

The true incidence is unknown and the condition as of now is undercorrected and undertreated. However, symmastia caused by augmentation mammoplasty is relatively uncommon and connected to a specific group of different malplacements that are marked as complications of mammoplasty procedures.

The altered shape can occur in case of an aggressive dissection over the medial quadrant or the selection of an implant the doesn't match with the breast width.

Very few articles are dedicated to this complication and its treatment alone, with different techniques used for its correction, but to date there is no standard treatment. As we can see in literature, iatrogenic symmastia can be corrected with different techniques: capsulorrhaphy, neosubpectoral pocket dissection, and acellular dermal matrices are all effective options [5–7].

Reports of operative treatment of symmastia using a capsulorraphy approach have documented variable degrees of success. Recurrence rates range from as low as 8% to as high as 45% [8].

In this study, we review our experience performing a new method of capsulorrhaphy on 10 patients with iatrogenic symmastia. Our

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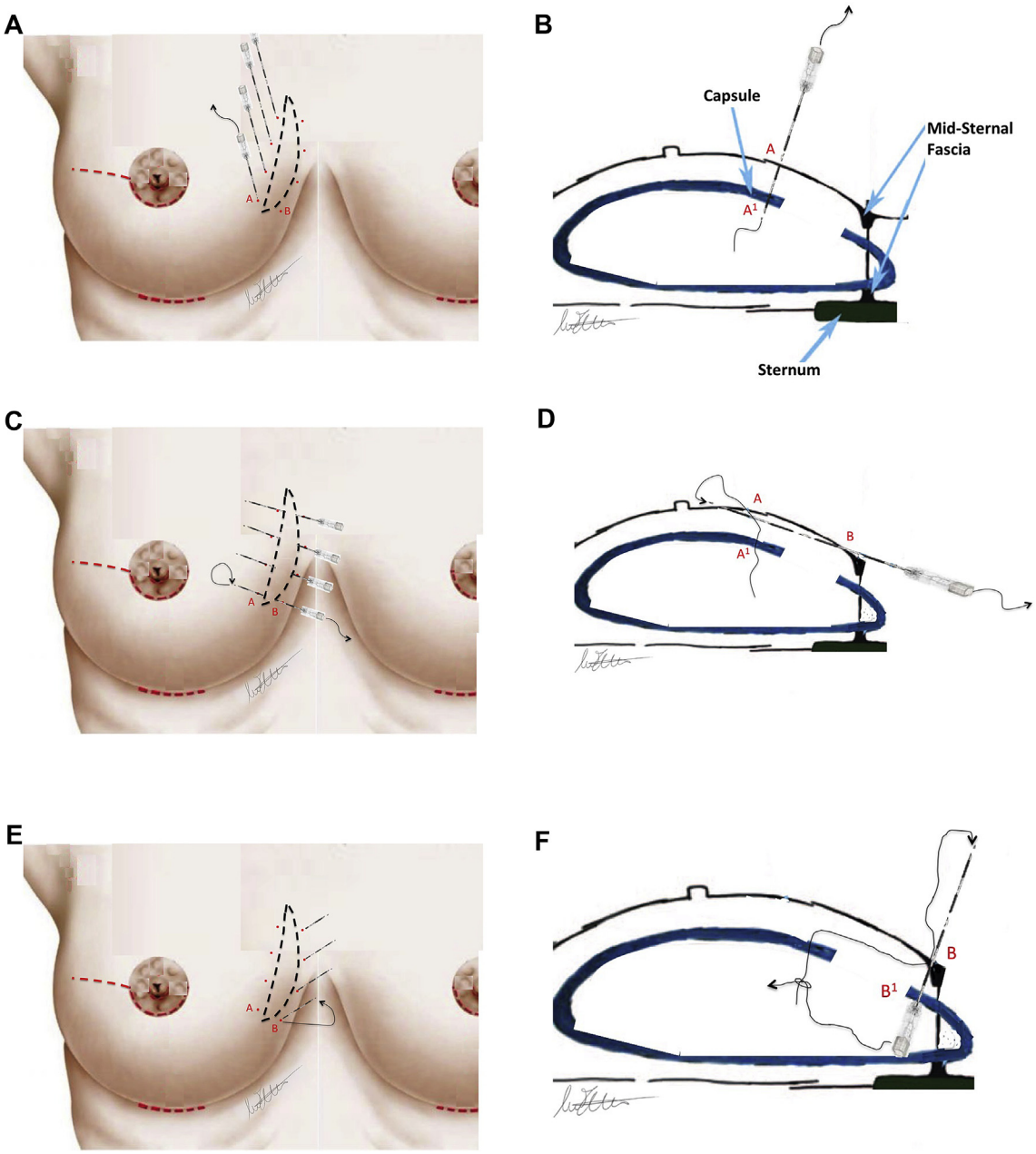

Fig. 1. Pericapsular suturing to close the medial portion of the pocket using a Tuohy needle.
A,B: A 20-ga Tuohy epidural needle, including the inner stylet, is inserted upwards through "point A" and exits at the internal part of the implant pocket ("point A1"). After removing the stylet, 2/0 polydioxanone suture is inserted into the needle tip.
C,D: The needle is reintroduced through "point B", it is passed through the same plane for 4–5 mm, perpendicular to the capsulotomy area, until the needle tip exits at "point A". After removing the stylet, the suture, previously drawn out through "point A", is reinserted into the needle tip until it exits through the needle head.
E,F: The needle is removed and reintroduced through "point B1" (B exits at the inner portion of the implant pocket). After removing the stylet, the suture, previously drawn out through "point B", is reinserted, into the needle tip until it exits through the needle head. Having accomplished a complete loop with the distal end of the suture around the capsulotomy area, we can remove the needle. Back movement and the interrupted suture is closed and is cut on the internal side of the implant pocket.

technique offers a novel, clear alternative for the sharp placement of secure pericapsular subcutaneous sutures through a small needle puncture site.

2. Materials and methods

A retrospective chart review was performed for 10 consecutive patients with symmastia who previously underwent secondary breast monolateral reconstruction from November 2006 to June 2015. In the current series of symmastia, all patients had their initial mammoplasties performed in the submuscular pocket and high profile microtextured cohesive gel silicone implants were used.

The same surgical technique was used for all patients. Procedures were performed by the senior surgeon of our department (P.C.P) at S.M.della Misericordia Hospital, Udine, Italy.

The review of the patients included an evaluation of the size of the previous implant and the final prostheses. It also took into account the number of previous implant operations and the anatomical location of the implants, as well as the presence of chest wall deformities.

Patients were visited on postoperative days 3, 7, and 14, and follow-

up visits were scheduled at 1 month and every 6 months post-operatively to confirm the absence of symmastia. Outcomes were reviewed to assess possible occurrence of symmastia recurrence and related complications.

The ethics committee of our institution approved the study design. A written informed consent was obtained from all patients. This case series was reported in line with the PROCESS criteria [9].

2.1. Pre-operative examination

In some patients symmastia is easily observable in a standing or supine position: breasts are markedly confluent across the midline, at times merging at different levels. In other less obvious cases, breasts present an appropriate intermammary line in repose; however, through simultaneous medial compression of the breasts, we can observe a confluence revealing an underlying symmastia.

Pre-intervention considerations should be made in regard to the anatomy of the thorax (as in the presence of pectus deformities, scoliosis, rib flaring, chest-wall hypoplasia, and muscular abnormalities), along with breasts clinical examination.

In particular, specific details need to be taken into account, such as breasts size and the related symmetry, base dimension of each breast, discrepancies between the inframammary fold levels, as well as size and position of both nipples.

In addition to this, further evaluations need to conducted on the presence of excess tissue across the presternal region, or possible intermammary separation at rest, along with the evaluation of the risk for the breasts to reach or even cross the midline, at rest or by compression.

2.2. Operative technique

All patients were carefully marked sitting and in supine position; while standing, preoperative marking was performed over the midline (with a neomedial boundary leaving a 3 cm intermammary distance from the midline), the inframammary fold, and the lateral sternal border. The outline of the implant pocket was drawn on the patient. Surface markings were used over the areas that required capsular reinforcement (a digital simulation of the capsulorrhaphy was created before the marking).

The patient was given general anesthesia with oral intubation. All patients received perioperative antibiotic prophylaxis (cephazolin 2 g, intravenous injection, 30 min before the beginning of surgery).

The skin incision was performed across mastectomy scar, old implants were removed and their integrity assessed (all patients presented high profile microtextured cohesive gel silicone implants). Once the implant was removed, the anterior capsule layer was identified behind the pectoralis major; the capsule above the sternum wasn't removed. A crescent-shaped area of capsular tissue in the medial quadrant was resected to restore the medial aspect of the conus. Then, the capsule around the medial capsulotomy was tattooed percutaneously with a needle and methylene blue at the previously marked external line, as adviced by Chasan [10].

To ensure the correct placement of the sutures and knots, a Tuohy Needle (20GX3.5, Medline Industries, Inc, Northfield, Illinois, USA) was used to guide the suture around the capsule and out through the same subcutaneous tract.

The details of this maneuver are shown in Fig. 2. A 20-ga Tuohy epidural needle, including the inner stylet, was inserted upwards through point A and passed through the subdermal plane, across the medial line of the designated area. The needle tip exited through the internal side of the implant pocket (point A1). After removing the stylet, 2/0 polydioxanone suture was inserted into the needle tip, holding the suture with forceps, and gently pushed until the end of suture passes through (Fig. 1A,B). The needle was removed and reintroduced, with the inner stylet, through point B. The needle was passed through the same plane for 4–5 mm, perpendicular to the capsulotomy area until the needle tip exited at point A. After removing the stylet, the suture, previously drawn out through point A, was reinserted, using forceps, into the needle tip until it exited through the needle head (Fig. 1C,D). In this way the running suture operates as a single layer to plicate the capsule equidistantly from the capsulotomy margin. The needle was removed and reintroduced, along with the inner stylet, through point B1 (B exits at the inner portion of the implant pocket). After removing the stylet, the suture, previously drawn out through point B, was reinserted, using forceps, into the needle tip until it exited through the needle head. Having accomplished a complete loop with the distal end of the suture around the capsulotomy area, we were able to remove the needle. The knot was tightened by pulling both ends in a horizontal straight line perpendicularly to the capsulotomy line (Fig. 1E,F). The operation must be performed 4 times for every breast.

Then, the sutures were inserted in the intermammary area of the midline between the dermis of the presternal skin and the periosteum at the medial sternal border, to recreate the intermammary sulcus.

For each suture manipulation, it is important to evaluate the patient with a sizer in place in both sitting and supine positions. A new downsizing high-profile microtextured cohesive gel silicone implant was used (is sufficient the reduction of the base implant of 1 cm) and irrigated with rifampicin. A closed suction drain was placed on each patient.

The wound was closed in three layers and then dressed in gauze and transparent film dressings. The area of capsulorrhaphy was then taped with a 2-inch foam tape reinforced with Transpore tape (left in place for 1 week).

After the procedure, the patient was placed in a surgical bra with gauze rolls applied laterally and between the breasts; a compression dressing was applied to the intermammary sulcus for 6 weeks, 24 h a day, to allow the scar tissue to obliterate of the repaired tunnel.

3. Results

Patients' demographics are reported in Table 1.

The patients ranged in age from 37 to 63 year- (mean age 48 years). The follow-up took place from 12 to 78 months, with a mean follow up of 24 months.

All patients had their initial implant pocket done in the submuscular plane and high profile microtextured cohesive gel silicone implants were used. Three patients had undergone one previous operation of medial capsulorraphy (with the recurrence of symmastia two years after), four patients (40%) had implants that appeared to us to be excessively large or too wide for their hemithorax and one patient had a congenital chest wall deformity (pectus excavatum). No patient presented a Baker III–IV capsular contracture before the operation.

Postoperative complications included 1 hematoma and 1 seroma (that required ultrasound-guided needle aspiration and no further surgery).

Postoperative cleavage between the breasts was achieved, and the patient was satisfied with the result. At 24-months follow-up, the result is still favorable (Fig. 2). Our patient was successfully treated with no recurrence, parasternal scarring, or infection.

Table 1
Patient data.

No. of patients	10
Patient age (average, y)	48,7
Size of last previous implant (average, cc)	422
Size of final prostheses (average, cc)	363
Number of patients with previous operations for symmastia	3
Anatomical location of the implant	10 submuscolar
Chest wall deformities	1
Complications	2
Length of follow-up (average, months)	24

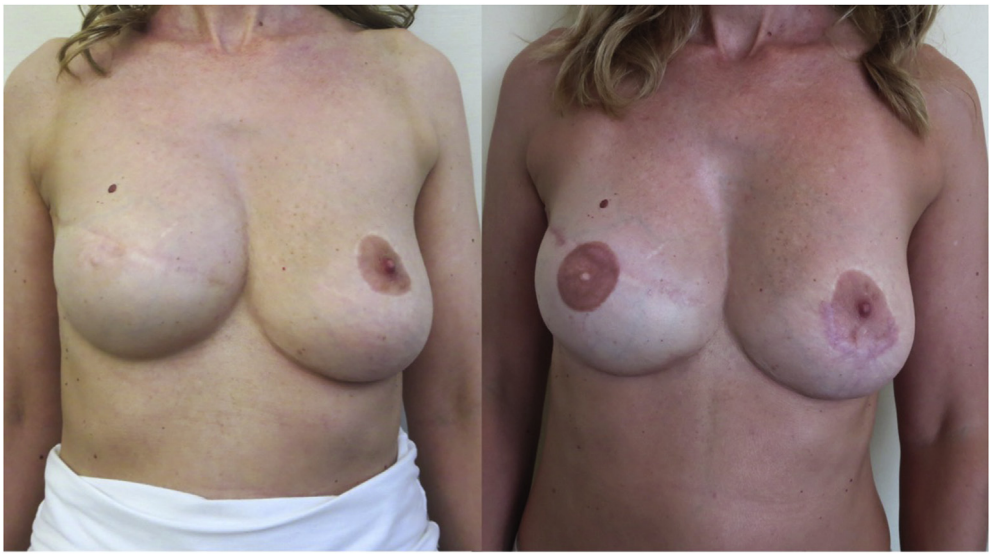

Fig. 2. (Left) Preoperative view of a 49-year-old woman with marked displacement and symmastia. On the right: postoperative result at 2 years showing satisfactory cleavage.

4. Discussion

Symmastia is one of the rarest breast implant complications and can be included in a specific category of malplacements caused by augmentation mammoplasty; it occurs when implants are inadvertently placed too close to the midline or in case of iatrogenic communication (resulting from over augmentation), which develops when the midline sternal attachment is disrupted, and in particular because of disruption of the midsternal fascia [5].

Patients who underwent multiple breast operations or over-aggressive medial dissection and present large implants or chest wall deformities are susceptible to developing symmastia [11].

Iatrogenic symmastia is difficult to treat and recurrence is common (additional reoperations expose patients to risks, costs and dissatisfaction). For this reason, prevention is paramount: implant selection and avoidance of mistakes such as excessive implant size, excessive implant base dimension and an over-aggressive medial dissection, are key factors in preventing symmastia. Gentle blunt dissection of the medial pocket under direct vision preserves the relatively thin and dense midsternal fascia, while also minimizing the occurrence of medial malpositioning caused by overzealous dissection of the medial fibers of the pectoralis muscle.

Correction requires combined restoration of the presternal subcutaneous integrity and medial closure of the pocket with reattachment of the capsule and subdermal tissue to the sternal periosteum.

There are various treatment options for iatrogenic symmastia, all of which present advantages and disadvantages [12–14]. Capsulorrhaphy appears to be a safe and reliable method for repairing breast implant malposition, improving the results of preoperative breast surgery. The technique enables to employ local capsulotomies in the area of a malpositioned implant, suturing the new fresh edges of the capsule together, using permanent braided suture.

This technique, while successful in 60–80% of cases, is not always efficient in the medial and inferior regions, due to the continued gravitational pressure generated by the implant against the suture lines with time [14]. Reports of the results of operative treatment of symmastia using a capsulorraphy approach have documented variable degrees of success. Recurrence rates range from as low as 8% to as high as 45% [14].

Despite capsulorraphy has been successfully used over time, it remains a complex procedure, whose adoption can be hindered by an inefficient saturation that includes a large portion of both capsular flaps. For this reason, we decided to go on and look for alternative solutions in an effort to improve the stability of the capsular suture; for this reason, we switched onto our simple, inexpensive and easily repeatable technique, which enabled us to increase the amount of subcutaneous tissue grasped during the capsulorrhaphy procedure; this leads to an overall improvement in terms of strength of the repaired structure and results in a diminished incidence of recurrence for symmastia.

Our investigation was conducted on a consecutive series of 10 patients affected symmastia; we have demonstrated the efficacy of an open capsulorrhaphy using a pericapsular Tuohy approach. The outcome of this procedure was deemed satisfactory by both the patient and the surgeon.

As for our case, we removed the implants and performed a combination of medial closure of the pocket and subcutaneous suturing of the presternal soft tissue to the sternum periosteum.

To address the conus, we resected the medial crescent of the capsular tissue to further enhance the shape of the medial pole of the breast. Thanks to this method of capsulotomy we can restore the medial aspect of the conus and avoid the production of capsule wrinkles or the overlap of the residual medial capsule.

Our pericapsular Tuohy technique for medial closure of the pocket guarantees a secure and rapid repair; furthermore, grasping a larger amount of capsular tissue and obtaining a better subcutaneous course ensures a more resistant capsulorraphy. This technique did not cause any parasternal scars. The use of a cannula with a larger than 20-gauge bore might be more convenient but increases the chance of leaving a needle mark. The 2–0 polydioxanone suture provides long-lasting capsular support as compared to other synthetic absorbable sutures, and it also offers far superior tensile strength. Its monofilament structure provides good handling properties and excellent knot security and appears to be more suitable for the procedure in comparison with multifilament sutures.

The prostheses were implanted at the same stage: medial capsulorrhaphy often necessitates a downsizing of the implants. It is essential that oversized implants are avoided and the tension of the implant is not allowed to work against the suture repair.

An important step is the application of postoperative dressing and compression: in fact, tape reinforcement applied for 1 week after the capsulotomy not only helps relieve the tension of the repair, but also obliterates the dead space; then, a compression dressings (with a bolster or a sternal shaping bra) was applied to the intermammary sulcus (for 6

weeks) to facilitate the healing of the area between the skin and the chest wall.

Although it is impossible to make a direct comparison because of the variety of the cases, it is our impression that this technique prevents the occurrence of trial and error, resulting in operative times that are similar to those of the traditional approaches.

The learning curve for this technique consists of approximately 2–3 cases, and it can easily be taught to residents and fellows.

The only complications that occurred in our series were one hematoma and one seroma, while no recurrence of the symmastia on follow-up was observed.

5. Conclusion

Iatrogenic symmastia can be successfully treated through a combination of crescent-shape medial capsulorraphy, pericapsular Tuohy technique for medial closure of the pockets, skin fixation to sternum, and postoperative intermammary compression, as we described.

We strongly believe that this method represents a very effective and versatile tool to address different issues related to breast implant complications. Further research may enable validation of the result across cases; so other studies with larger series, longer follow-ups and control groups are necessary to definitively demonstrate its efficacy in the long term or even its superiority over conventional methods.

Ethical approval

The ethics committee of our institution approved the study design.

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None.

Author contribution

De Biasio F: study design, writing.
Zingaretti N: study design, writing, photo collections.
De Lorenzi F: study design, photos collections.
Massarut S: study design.
Parodi PC: study design.

Conflicts of interest

All authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers'bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relantionship, allilations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

Guarantor

Zingaretti N.

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