

Scar Asymmetry After Abdominoplasty

The Unexpected Role of Seroma

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Abstract: Achievement of symmetry remains one of the goals of cosmetic procedures. Interestingly, scar asymmetry after abdominoplasty has been rarely considered a complication. However, this can have a significant impact on patient and surgeon satisfaction. This study identifies silent seromas as a potential cause of scar asymmetry.

Among abdominoplasty procedures in a university hospital institution over a 30 months' period (October 1, 2007 to April 1, 2010), we retrospectively identified 6 patients who developed abdominal scar asymmetry only 3 months postoperatively and without any early warning complications (hematoma, seroma, or infection). Clinical examination was completed by abdominal diagnostic ultrasonography. Seroma capsulectomy under local anesthesia was performed in all cases.

In all patients clinically presenting late abdominal scar asymmetry, ultrasonography confirmed the presence of an encapsulated chronic seroma. Surgical capsulectomy under local anesthesia resulted in reestablishment of former symmetry and high patient satisfaction. No complications such as wound infection, dehiscence, hematoma, or recurrence of seroma were detected after revision surgery.

In our experience, fibrous capsule due to chronic seromas resulted in abdominal scar deviation and asymmetry. Surgical capsulectomy followed by wearing of compressive garments resulted to be an effective treatment with pleasant aesthetic outcome and no seroma recurrence. Silent seromas should be considered as a possible etiologic factor of scar asymmetries appearing during late follow-up after abdominoplasty.

Key Words: scar asymmetry, seroma, abdominoplasty, aesthetic

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Abdominoplasty is one of the most common procedures in plastic and aesthetic surgery, and the incidence was steadily increasing over the past decade.¹ Multiple studies have been conducted to evaluate the complications after abdominoplasty. Comparison of the literature is difficult, since different criteria were used to define early and late, major and minor complications.^{2–4} Generally, seroma, hematoma, and infections are the most common and frightened complications in the postoperative period, with the potential need for surgical revision and prolonged hospitalization or the risk of wound dehiscence.¹ Late complications mainly include “dog ears”, unsatisfactory hypertrophic scars, and localized fatty excess, which may

require surgical revision.² Interestingly, abdominal scar asymmetry after abdominoplasty is rarely contemplated as a possible late complication^{1,2} and in clinical practice may be mistakenly attributed to poor planning, asymmetric wound closure, subcutaneous tissue asymmetry, fat necrosis, or soft tissue remodeling. In our experience, late scar asymmetry was secondary to untreated subclinical chronic seromas that lead to the formation of a fibrous capsule (*pseudobursa*). In this retrospective study, we investigate the unexpected role of seromas in abdominal scar asymmetries. Etiology, diagnosis, and surgical treatment are discussed.

PATIENTS AND METHODS

For this study, we retrospectively selected only those patients who developed abdominal scar asymmetry at the 3-month follow-up (and asymmetry was not present at the moment of early postoperative evaluation), after having undergone abdominoplasty for cosmetic reasons. The standard procedure was a classic abdominoplasty with flap preparation to the costal margin and the xyphoid process and with umbilical transposition. No progressive tension sutures or quilting sutures were used. All patients underwent rectus diastasis correction. Two drains were used in all patients and removed if the output was <30 mL per 24 hours. The exclusion criteria were reconstructive procedures, previous abdominal operations, abdominal wall hernias, and patients suffering from immediate postoperative hematoma, seroma, or wound infection.

Surgical Technique of the Seroma Revision

All procedures were performed under local anesthesia on an outpatient basis. Using sharp dissection, total capsule excision was performed. The subcutaneous tissue was quilted to the muscular fascia (PDS 2-0; Ethicon Inc, Johnson & Johnson, Belgium) to reduce the dead space created from the capsulectomy. The skin was closed with standard superficial fascia and dermal single-stitch sutures and completed by an intracutaneous running suture (Fig. 1). Suction drain was placed and removed if flow was <20 mL per 24 hours. An abdominal elastic compression girdle was worn for 6 weeks.

RESULTS

A total of 121 patients matched the inclusion criteria. In 6 patients (5%), clinically presenting with late abdominal scar asymmetry, ultrasonography confirmed the presence of an encapsulated seroma. Intraoperatively, we assessed in all cases the presence of a fibrous pseudocapsule, which was found to be the cause leading to scar asymmetry. In fact, the capsule (with thickness up to 6 mm) was generally located between the rectus fascia and the subcutaneous tissue, adherent to the superficial scar and leading to asymmetrical deviation. Ultrasound provided useful information about extension and volume of the pseudocapsule, which ranged from 70 to 160 mL (mean \pm SD, 108.3 \pm 30.6 mL; Table 1). Postoperative healing was uneventful in all cases. Patients were seen for follow-up 2 weeks, 3 months, and 12 months postoperatively (Fig. 2). No complications such as wound infection, dehiscence, hematoma, or recurrence of

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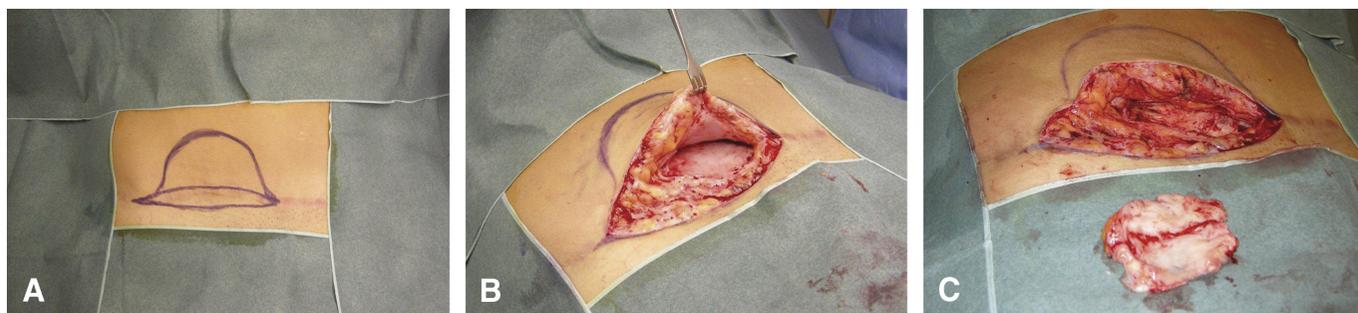


FIGURE 1. Intraoperative view of the capsulectomy procedure. A, Preoperative design. B, Dissection of the pseudobursa. C, Final excision

seroma were detected after revision surgery. Surgical capsulectomy resulted in reestablishment of former symmetry and high patient satisfaction.

DISCUSSION

Symmetry and proportion are the essence of aesthetic surgery, and abdominal scar asymmetry may have a significant impact on patient’s (and surgeon’s) satisfaction. Assuming that the patient’s sensibility is of paramount importance in aesthetic surgery, pleasing their expectations is crucial to a successful outcome. A number of abdominoplasty techniques have been described with the aim of maximal symmetry and placement of the final scar according to fashion trends and patient’s desires.^{5,6} Imperfect preoperative drawing, differences between actual skin resection and design, shifting bulk of soft tissues, and the differences between the upright and supine position⁶ may all account for early postoperative abdominal scar asymmetry. However, in our experience, among patients that underwent abdominoplasty for cosmetic reasons, 6 developed abdominal scar asymmetry at late postoperative follow-up only (3 months). Ultrasonography showed in all cases a unilateral, encapsulated seroma that was identified as the cause of downward curving of the scar.

Seroma is a fluid collection, rich in neutrophils and protein, with the characteristics of an exudate,⁷ and represents the most frequent complication after abdominoplasty. Incidence ranges from 0.3% to 90% in literature,^{8,9} with 10% to 15% as the generally observed value.^{1,10} Obesity (BMI > 30 kg/m²), weight loss, previous supraumbilical incision, combined liposuction or ultrasound lipectomy, cutting with the cautery, and wide undermining have been identified as potential risk factors for seroma development.^{1,6,9,11,12} Various mechanisms have been postulated in the literature for seroma formation. Dissection, detachment, and shearing of fasciocutaneous flaps,^{10,13} with consequent damage of lymphatic architecture and rupture of the fibrous septa, seem to be the key etiologic factors. The loss of anchorage of the skin to the deep fascia results in a dead space where

fat, blood, and lymph can continuously drain.¹⁴ If small fluid collections can be spontaneously reabsorbed, bigger amounts may increase pressure causing wound dehiscence, necrosis, and infection, which result in significant morbidity and delay in recovery.^{10,15} Different approaches have been used to prevent immediate postoperative seroma formation, including quilting sutures, sclerotherapy, prophylactic drain insertion, or fibrin sealant, as recently described.¹³ However, late complications of chronic seromas finally affecting the aesthetic outcomes have received less attention and have been barely described.

In our experience, clinically silent seromas influenced the aesthetic outcome after abdominoplasty with unilateral downward deviation of the abdominal scar. In fact, untreated chronic seromas may eventually end up in encapsulation by connective or granulation tissue, leading to the formation of a fibrous capsule, or pseudobursa.^{10,14} The pseudobursa may evolve in time and cause deformity of the abdominal wall¹⁶ or a less striking scar asymmetry in the late postoperative period. Among our patients, ultrasound was the method of choice for seroma detection, as previously reported.^{10,12,17} Primary diagnosis by clinical examination was confirmed and completed by ultrasonography, with additional information for preoperative planning, like exact volume estimation and capsule extension among other structures.

In conclusion, we would like to point out the possible role of silent seromas as a potential cause of abdominal scar asymmetry after abdominoplasty. Surgical capsulectomy followed by quilting sutures and

TABLE 1. Patient Data

Patients (n)	Age (y)	BMI (kg/m ²)	Smoker (Yes/No)	Volume of Pseudocapsule (mL)
1	46	27	Yes	90
2	38	30	No	110
3	74	23	No	160
4	40	26	No	70
5	42	27	Yes	120
6	41	24	No	100
Mean ± SD	47 ± 13	26 ± 3	33%	108 ± 30

Decimals were rounded off for clarity purposes.

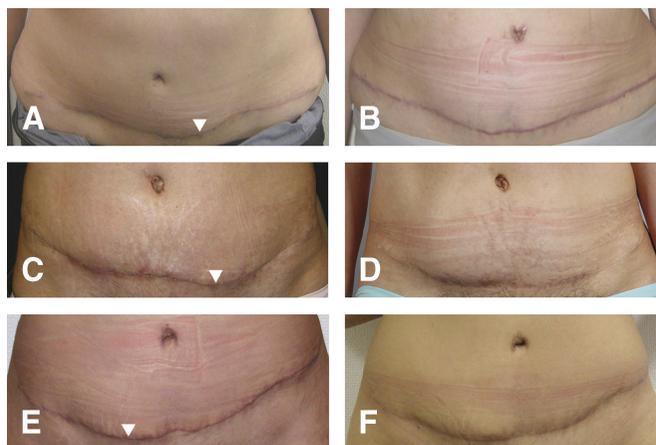


FIGURE 2. Preoperative (A, C, E) abdominal scar asymmetry with downward deviation 3 months after the abdominoplasty and postoperative outcomes after pseudobursa capsulectomy under local anesthesia (B, D, F). White arrowheads, Inferior migration of the scar due to the pseudobursa formation.

wearing of compressive garments for 6 weeks resulted to be an effective treatment, reestablishing cosmetic balance and, most importantly, patient's confidence and satisfaction.

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