

Using Fat Grafting to Treat Breast Implant Capsular Contracture

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Summary: Capsular contracture is a frequent complication of breast augmentation and reconstruction that affects up to 30% of patients. The authors describe the effect of fat grafting on capsular contracture used in cases with the primary intention of improving soft-tissue characteristics before implant to implant or implant to fat exchange. Fifteen patients (18 breasts) with capsular contracture Baker grade 4 were reviewed. Pain from capsular formation was able to be ameliorated in all cases after lipofilling sessions, with 11 of them achieving analgesia. Afterward, 4 patients underwent implant to implant and 7 patients implant to fat exchange. Four patients chose to keep the implants after the end of fat grafting procedures, due to satisfying cosmetic results and excellent pain management. Fat grafting may be a useful addition to therapies currently used to treat capsular contracture. (*Plast Reconstr Surg Glob Open* 2018;6:e1969; doi: 10.1097/GOX.0000000000001969; Published online 13 November 2018.)

One of the most common causes of reoperation after breast augmentation or implant-based reconstruction is capsular contraction, with a prevalence of 0.5–30%.¹ It seems that the problem is multifactorial, leading to a variety of treatments, while scientists are continually in search of new substances to influence the capsule formation.^{2,3} In our retrospective study, we report the effect of fat grafting on patients who had a capsule contracture but were treated primarily with the intention of restoring thickness to the soft-tissue envelope and finally exchanging the implant with fat or with another implant.

PATIENTS AND METHODS

The present study has been conducted according to the principles expressed in the Declaration of Helsinki. A retrospective review was performed to identify patients who had been treated due to capsular contracture grade

Baker 4 from 2013 to 2017, with the goal of exchanging the implant with a new one or totally replacing the implant with fat. In the first group, due to the thinness of the parenchyma, fat grafting was performed to strengthen the entire skin envelope and to treat deformities. In the second group, serial lipofilling sessions were conducted that increased the volume of the treated breast. After completion, the implant was removed and the remaining breast was reshaped. Patient demographic information, history of capsular contracture and previous treatments, surgical indication, placement of implant, pain sensation, and post-operative complications were recorded (Table 1). Before and after the operations, we asked the patients to quantify the pain using the Numerical Rating Scale (Table 2), which has been proven a very reliable measure of pain intensity.⁴ In our series, we used the Body-Jet (Human Med, Schwerin, Germany) technique, which combines water-jet-assisted liposuction, purification and grafting.⁵ Regarding the fat transfer, subpectoral and epipectoral cases were treated in the same way without direct visualization of the capsule. Before the operations, ultrasound assessment of the tissue envelope was performed. Once an overview of the thickness was obtained, efforts were concentrated to position the fat on the capsule.

RESULTS

Fifteen patients (18 breasts) were reviewed. Ten patients (13 breasts) had undergone surgery for postmastectomy implant-based reconstruction and 5 (5 breasts)

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Liposuction device: Bodyjet, Human med AG, Schwerin, Germany.

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Table 1. Patients' Demographics with Baker 4 Grade Capsular Contracture

Pt	Breasts	Age (y)	BMI	Side	Cup Size	Setting	Implant Position	Prior Nr. CC	Prior Surgery for CC	Duration of Project (mos)	Sessions	Mean Volume Transferred per Session (cc)
1	1	37	29	Right	80C	rec	Dual plane, ADM	None	None	25	5	260
	2			Left		rec	Dual plane, ADM	None	None		5	210
2	3	58	24	Right	80B	rec	Dual plane	None	None	6	2	375
3	4	26	35	Left	90C	cos	Dual plane	None	None	9	4	430
4	5	26	22	Right	85B	cos	prepec	None	None	16	3	295
5	6	23	33	Right	85C	cos	prepec	None	None	13	4	280
6	7	54	23	Right	85A	cos	poland	Once	IE	10	4	300
7	8	56	26	Left	85C	rec	LD	None	None	7	4	350
8	9	70	29	Left	90C	rec	Dual plane	None	None	17	5	250
9	10	72	31	Right	90B	rec	LD	Once	LD-IE	9	3	420
10	11	54	28	Right	85B	rec	prepec	None	None	15	4	245
	12			Left		rec	Dual plane	Once	IE		280	
11	13	61	21	Right	80B	rec	Dual plane	None	None	6	2	270
12	14	60	22	Left	80B/C	rec	LD	Twice	IE, LD-IE	4	2	300
13	15	22	34	Left	85C/D	cos	Dual plane	None	None	8	3	320
14	16	61	27	Right	85B	rec	Dual plane	None	None	30	3	300
15	17	58	26	Right	75 B	cos	prepec	None	None	3	2	220
	18			Left		cos	prepec	None	None		2	220

Patient demographics, summary of clinical interventions.

BMI, body mass index in kg/m²; CC, capsular contracture; cos, cosmetic; IE, implant exchange; LD, latissimus dorsi flap; rec, reconstructive. poland, poland syndrome; prepec, prepectoral implant position; ADM, acellular dermal matrix

Table 2. Pain Development and Complications

Pt	Breasts	Initial	After 1	After 2	After 3	After 4	After 5	Procedure	Complications
1	1	8	5-6	3-5	0	0	0	No change	No
	2	8	5-6	3-5	0	0	0	No change	
2	3	6-7	3-4	0				Implant to implant	No
3	4	8	3	2	1	0		Implant to fat	Yes
4	5	8	4	4	4			Implant to fat	No
5	6	7	0	0	0	0		Implant to fat	No
6	7	3	0	0	0	0		Implant to implant	No
7	8	8-9	5-6	5	1	0		Implant to fat	No
8	9	5	0	0	0	0	0	Implant to fat	No
9	10	3	0	0	0			Implant to fat	Yes
10	11	9	2	2	0	0		Implant to fat	No
	12	9	4	4	4	4		Implant to fat	
11	13	5	0	0				Implant to implant	No
12	14	7	4	1-2				No change	No
13	15	2	0	0	0			No change	No
14	16	8	6	6	6			Implant to implant	No
15	17	5	0	0				No change	No
	18	5	0	0				No change	

Pain rating (NRS) before lipofilling (initial) and after 1, 2, 3, 4, and 5 lipofilling sessions.

for aesthetic indications, Poland syndrome and anisomastia. Four patients underwent implant to implant and 7 patients implant to fat exchange. Four patients chose to keep the implants after the end of fat grafting procedures, due to satisfying cosmetic results and excellent pain management (Fig. 1). In all cases, it was possible to ameliorate pain from capsular formation. Two of the 8 patients with subpectoral/dual plane, 1 of the 4 patients with subglandular implant position and 1 of the 3 patients with implant under the latissimus dorsi could not achieve analgesia, but, at the end of the fat grafting sessions, experienced significant pain reduction, which translated into an improved quality of life (eg, they could again exercise or sleep on the side with the capsular contracture).

Fat grafting led in all cases to better breast sensation, this being defined as a reduction of the foreign body sensation, the feeling of tension in the breast often radiating

to the axilla and the feeling of a cold breast. In most cases, the period between lipofilling sessions lasted 3-4 months, which can be regarded as the mean follow-up time. In other (Table 3), the follow-up periods were definitively longer, up to 1 1/2 years. In these time spaces, regular examinations took place, demonstrating that the reduction of pain sensation was remarkably steady. The data show that the effect of fat grafting sets in mere weeks after the intervention, with all patients reporting an improvement as soon as 6 weeks.

Two patients developed an infection, one during the fat grafting sessions and one after the implant removal.

DISCUSSION

Roça et al.⁶ evaluated the efficacy of autologous fat grafting in a porcine model as a treatment for capsular

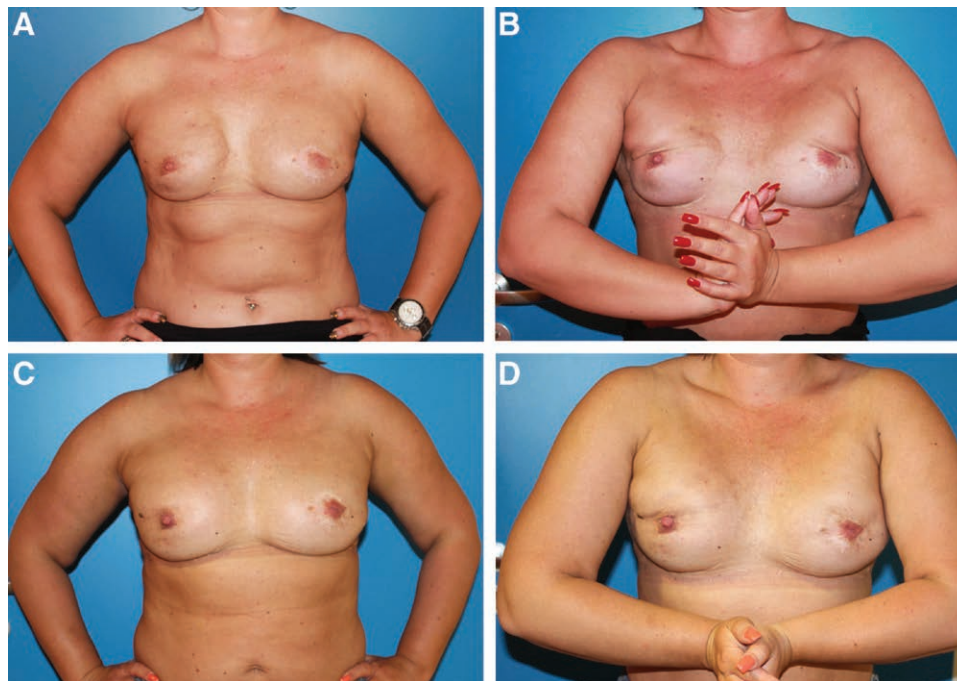


Fig. 1. Reaching and sustaining analgesia. Preoperative pictures (A and B) of a 37-year-old patient (patient 1 of Table 1) with a history of breast cancer on the right side, after nipple-sparing mastectomies and implant-based reconstruction on both sides. Implant position is subpectoral/dual plane on both sides. The postoperative pictures (C and D) were taken 12 months after the last of 5 sessions of fat grafting. The ultrasound examination of the soft-tissue envelope before the procedures revealed a thickness of at least 0.2 cm and after them of at least 1.2 cm. The patient reported a softening of the capsule after the lipoinjections on both sides. Animation deformity improved also considerably.

Table 3. Follow-up Periods

Pt	Time	Months
1	Last lipofilling session	17
2	Between last fat grafting session and implant removal	8
4	Between second and third fat grafting session	12
5	Between second and third fat grafting session	6
9	Between last fat grafting session and implant removal	11
12	Last lipofilling session	11
13	Last lipofilling session	9
14	Between last fat grafting session and implant removal	10
15	Last lipofilling session	5

contracture reporting a lack of difference in Baker classification after lipoinjection, although the capsules of treated animals were softer than those of untreated animals.

Our results go a step further and demonstrate that fat grafting can be used for pain relief due to capsular formation, regardless of the implant position to the pectoral muscle. Lipofilling has even the ability to reverse the capsular contracture grade from 4 to at least 3 and especially in subglandular positioned implants. In the cases of subpectoral/dual plane positions, the outcome seems to depend on the ability to position the fat graft directly in the interface between muscle and capsule, which is a more difficult task, mainly due to fears of damaging the

implant, but can also be excellent. Patient 10 with prepectoral implant reconstruction on the right and dual plane on the left side highlights the different effects in both situations (Fig. 2). In the cases where latissimus dorsi muscle was used for implant coverage, putting the fat graft in the right plane was easier and led to excellent pain reduction. The possible reasons that 3 patients (patients 4, 10 left side, and 14) did not achieve freedom from pain could be, besides unsuitable placement of fat (currently we place the fat under direct visualization of the plane using ultrasound), that with lipoinjections only the ventral part of the capsule, the one pointing to the breast, is treated, and this does not influence pain that is generated by the dorsal capsule on the thoracic wall. But as pain rating scales between patients are not directly comparable (there is no direct comparison of the low starting pain levels of some patients with the higher ones of other patients),⁷ the emphasis should be given on the pain reduction achieved. Even in those patients who started with “high” pain levels (patients 4, 10 left side, and 14) and did not reach pain freedom, the pain reduction is significant (pain reduction in 2 of them was 50%, only patient 14 experienced reduction of 25%). Additionally, follow-up intervals of more than a year indicate that fat grafting can produce stable results over a long period of time.

Our cases demonstrate that, with the adequate management of pain at the presence of an acceptable cosmetic result, the need for implant replacement is delayed, or even

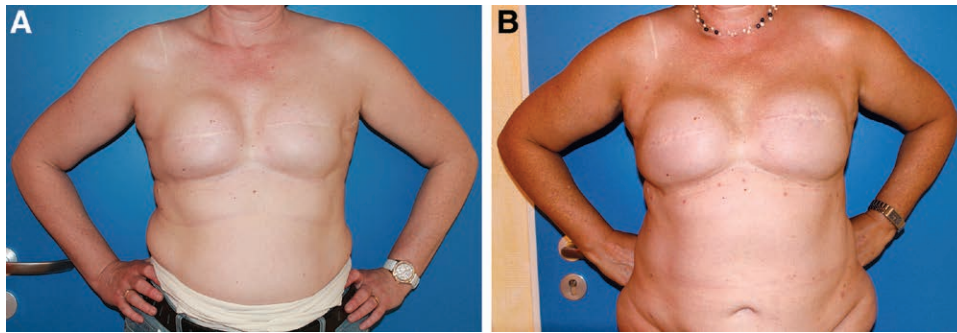


Fig. 2. Effects depending on implant position. A and B, Preoperative and postoperative views (after the lipofilling sessions) of a 54-year-old patient with a history of breast cancer on the left side, skin-sparing mastectomies and implant-based reconstruction on both sides with bilateral capsular contracture (patient 10 of Table 1). On the right side, implant position is prepectoral, on the left subpectoral/dual plane. Although the patient reported a softer capsule on the right side, the capsule was only partially softer on the other.

eliminated. This can be of great benefit in aesthetic surgery, but predominantly in reconstructive surgery, given that the most frequent type of breast reconstruction worldwide is implant based. Due to its regenerative properties, the concept of fat grafting could be applied to ameliorate fibrotic damage, especially after implant-based reconstruction and successive radiation therapy, a setting that degrades the cosmetic outcome and substantially increases the risk of capsular contraction. The number of sessions needed to achieve analgesia varies from patient to patient because the pain attributed to capsular fibrosis is experienced very differently among them and correlates often, but not always, with the capsule stiffness. Some patients needed one session to achieve good pain control, whereas others 5 sessions, showing an adding effect of the lipofilling over time. In this regard, patient 12 would have reached analgesia, had she not declined a third session. Our findings are in line with results reported from other groups, showing that fat grafting can be used successfully to treat pain, for example, pain after breast-conserving therapy or mastectomy (postmastectomy pain syndrome).^{8,9}

CONCLUSIONS

Our observations lend support to the potential benefit of fat grafting as a novel strategy for the treatment of pain due to capsular contracture. Lipofilling could be a valuable tool in treating capsular contracture, in alleviating pain, and in improving skin quality and sensation of the breast.

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