The effects of the Aspen Rehabilitation Technique (ART)* on capsular contracture after elective or reconstructive breast augmentation: a pilot study.

> * **ART** is a specific combination of traditional physical therapy modalities modified for the treatment of CC, and developed by the staff of the Aspen Rehabilitation of Coral Springs, Florida under the supervision of Tim Weyant, MS PT.

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Purpose:

The purpose of our project was to describe the effects of the Aspen Rehabilitation Technique (ART)* on capsular contracture after elective or reconstructive breast augmentation.

Background:

Capsular contracture (CC), or capsular contraction, is an undesirable negative outcome that can occur after an otherwise successful elective or reconstructive breast augmentation. It may be defined as the presence of a fibrous shell composed of scar tissue that surrounds a breast implant. CC may result in complaints of pain, palpable hardness, and undesirable changes breast shape.

Traditionally, CC has been managed by one or more or the following interventions: surgical revision, drug therapy, often using “off-label” compounds, manual mobilization by a massage therapist or other health care provider, or manual mobilization (closed capsulotomy) by a qualified surgeon. All these interventions are associated with risks, including re-occurrence, infection, and seroma.

Based on a review of the literature, informal interviews with several reconstructive surgeons, and our experience and training as physical therapists who frequently treat limited range of joint motion secondary to contracture of synovial joint capsules, we developed a system of employing traditional physical modalities to treat CC. We dubbed the system the “Aspen Rehabilitation Technique” (ART).

ART is a proprietary technique that includes manual ("hands-on") therapies and ultrasound (US), delivered via a transducer (soundhead) specifically designed to treat CC, and specific guidelines for duration, frequency, and intensity of the ultrasonic energy. All the individual elements of ART are based on well-established principles of cellular biology, the physiology of wound healing, and traditional physical therapy practice. The ultrasound parameters are well-within guidelines of the United States Food and Drug Administration.

Method:

This was a retrospective study.

Our subjects included 21 patients randomly selected from a series of over 200 patients referred for ART after diagnosis of post-surgical capsular contracture (CC). Sixteen had elective surgery, and 5 underwent reconstructive augmentations.

Patients were evaluated immediately before and immediately after a series of treatments with ART. The number of treatments ranged from 1 to 14 over a period of between 7 to 90 days.

The evaluations included 1) patient satisfaction with breast softness, 2) patient satisfaction with breast shape, 3) Baker grade (of breast softness), 4) asymmetry of breast position, and 5) patient perception of overall improvement with the ART program. Not all measurements were available for each patient, so the number of patients (n) was not equal for all measurements.

Patient satisfaction with softness was measured by asking the patient rate their satisfaction with softness on a scale of 0 to 10; with 0 signifying unacceptably hard, and 10 indicating complete satisfaction with softness.

Patient satisfaction with breast shape was measured by asking the patient rate their satisfaction on scale of 0 to 10; with 0 signifying unacceptable shape, and 10 indicating complete satisfaction with shape.

Baker grade (of breast softness) has been used extensively in the literature, with the grades of 1 to 4 defined as follows:

1. Breast looks and feels normal
2. Breast feels a little firm but looks normal
3. Breast is more firm and visually distorted (shape change or mal-positioned) relative to normal.
4. Breast is hard and greatly distorted in shape and position

Asymmetry of breast position was measured by capture of a front-view image of both breasts, and precise measurement of the vertical distance between the inferior aspect of the breast with the CC versus the uninvolved and/or contralateral breast.

Patient perception of overall improvement resulting from ART was measured by asking each patient after the final ART treatment to rate their improvement on a 0 to 10 scale, with 0 signifying no improvement at all, and 10 representing a 'complete' improvement; that is, a completely satisfactory outcome.

Results:

Patient satisfaction with breast softness before undergoing ART ranged from 0 to 4, with a mean of 1.55 (SD=1.44, n=12). Patient satisfaction with breast softness after undergoing ART ranged from 4 to 10, with a mean of 8.85 (SD=1.56, n=13). This is a mean improvement of 7.3 (SD+1.73). Ratings of satisfaction with breast softness before and after ART of individual patients are displayed in Table 1.

Baker grades before undergoing ART ranged from 1 to 4, with a mean of 2.76 (SD=0.75, n=21). Baker Grades after undergoing ART ranged from 1 to 3, with a mean of 1.38 (SD=0.58, n=21). This is an average decrease of 1.38 grades. Baker grades of individual patients are displayed in Table 2.

Asymmetry of breast position before undergoing ART ranged from 4 to 25 millimeters (mm), with a mean of 11.54 (SD=7.23, n=20). Asymmetry of breast position after undergoing ART ranged from 0 to 3 mm., with a mean of 0.93 (SD=1.13, n=20). This is a mean decrease of 10.60 mm (SD=6.10), or 92%. Asymmetries of breast position before and after ART of individual patients are displayed in Table 3.

Patient perception of overall improvement resulting from ART ranged from 8.5 to 10, with a mean of 9.81 (SD=0.40, n=15). Perceptions of overall improvement resulting from ART of individual patients are displayed in Table 4

There were no negative side effects.

Discussion:

The 21 subjects in our pilot study clinically meaningful improvements in both subjective and objective measurements, including satisfaction with breast softness, breast shape, Baker grade, and breast asymmetry. The great majority expressed satisfaction with the overall outcome of the ART.

Conclusion:

Our study suggests that the Aspen Rehabilitation Technique (ART)* can be an effective and safe intervention for individuals who develop capsular contractures (contraction after elective or reconstructive breast augmentation.

Table 1
Patient satisfaction with breast softness before and after undergoing ART

Rating	Before ART (Number of Patients)	After ART (Number of Patients)
0	4	0
1	3	0
2	1	0
3	3	0
4	1	1
5	0	0
6	0	0
7	0	0
8	0	2
9	0	4
10	0	6

Table 2
Baker grade before and after undergoing ART (4=worst, 1-best)

Rating	Before ART (Number of Patients)	After ART (Number of Patients)
4	3	0
3	11	1
2	6	6
1	1	14

Table 3
Asymmetry of breast position before and after undergoing ART (vertical distance between the inferior aspect of the breast with the CC versus the uninvolved and/or contralateral breast)

Distance in millimeters	Before ART (Number of Patients)	After ART (Number of Patients)
0	1	10
1	2	3
2	1	4
3	0	3
4	1	0
5	0	0
6	0	0
7	1	0
8	0	0
9	1	0
10	1	0
11	1	0
12	2	0
13	2	0
14	0	0
15	0	0
16	2	0
17	0	0
18	2	0
19	0	0
20	0	0
21	1	0
22	1	0
23	0	0
24	0	0
25	1	0

Table 4
Patient perception of overall improvement resulting from ART (measured by asking each patient after the final ART treatment to rate their improvement on a 0 to 10 scale, with 0 signifying no improvement at all, and 10 representing a 'complete' improvement; that is, a completely satisfactory outcome.)

Rating	Number of Patients
0 to 0.9	0
1 to 1.9	0
2 to 2.9	0
3 to 3.9	0
4 to 4.9	0
5 to 5.9	0
6 to 6.9	0
7 to 7.9	0
8 to 8.9	1
9 to 9.9	4
10	10