

Prophylactic Use of External Ultrasound for Breast Implant Capsular Contracture

After successfully treating breast implant capsular contracture with ultrasound, the author asks, "If it is demonstrated that ultrasound is effective for *treating* already existing contractures, could it be also effective in *preventing* them?" Here he presents his protocol and preliminary results of prophylactic application of ultrasound for the avoidance of capsular contractures. (*Aesthetic Surg J* 2002;22:205-207.)

The causes of breast implant capsular contracture are unclear and most likely multifactorial.¹⁻³ Although implantation of textured surface implants⁴⁻⁷ and several drug administration regimens⁸⁻¹³ have diminished the percentage of contractures, they still occur. Six years ago, I started applying external ultrasound to treat breast implant capsular contractures. Preliminary results were so positive that I was encouraged to continue.^{14,15}

The ultrasonic device that I use is similar to the one used for superficial soft tissue treatment. In an early study, I analyzed 52 patients, 25 of whom had bilateral contractures. Nineteen percent of the implanted breasts had a grade IV Baker scale contracture, whereas the remaining 81% were distributed between Baker scale grades II and III. The number of treatment sessions was determined by evaluating improvement. Patients were treated with repeat ultrasonic applications, ranging from 2 to 16 sessions, with an average of 6.4 sessions.¹⁵

To measure the effect of external ultrasound, contracture grade was analyzed before and after treatment. Changes were measured by subtracting the Baker scale value of the final state from the initial one. In all cases, a positive difference indicated an improvement in the patient's condition. In this study, I obtained an overall improvement rate of 82.6% at 1-year follow-up, with almost half of the contractures reaching total softness (Table 1).

In a preceding study of 24 patients,¹⁴ treated similarly, I found that in 97% of cases the degree of contracture improved at least 1 Baker degree. Joining both studies, an evaluation of 83.8% improvement at 1-year follow-up confirms observations of capsular softening and easier closed capsulotomy after external ultrasonic treatment. In most cases, a limited number of sessions, fewer than 8, was enough to obtain a long-term result. A satisfactory result was obtained in 75% of the cases. I also confirmed that the percentage of improvement was higher in patients with prepectoral-placed implants.¹⁵

The external ultrasonic treatment has proved to be easy to apply, well accepted by patients, and free of significant complications.^{14,15}

After analyzing the data and considering the positive results, I posed the following question: if it is demonstrated that ultrasound is effective for *treatment* of already existing contractures, could it be also effective in *preventing* them? Theoretical justification for prophylactic use is based on demonstrated properties and effects (Table 2).¹⁶⁻¹⁸

We theorized that early application of ultrasound facilitates healing, diminishes edema, and regulates inflammation, thereby diminishing the possibility of a future capsular contracture. The following protocol for prophylactic application was suggested initially: session 1, 24 hours after surgery; session 2, 3 days after surgery; session 3, 7 days after surgery; and session 4, 1 month after surgery.

Ultrasound was administered under the following parameters: level, prophylactic; energy, 60 J; power, 12 W; type, pulsed; time, 10 minutes. Early application of exter-



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Table 1. Measurement of capsular contractures around breast implants

Measurement	Pretreatment distribution %	Post-treatment distribution %
Baker I		48
Baker II	34	40
Baker III	47	8
Baker IV	19	4

Table 2. Effects of ultrasound**Mechanical**

Produces micromassages that improve lymphatic drainage and help to resolve the edema

Thermal

Increases speed of cellular metabolism

Activates fibroblast production

Helps the healing process, arranging the scar architecture

Biochemical

Helps vascular proliferation

Increases tissue oxygenation

Increases release of cellular mediators of inflammation

Increases fibrolytic processes

nal ultrasound was associated with the highest postsurgical inflammatory peak. The later applications were administered according to a "modulation" scheme of inflammation for up to 3 months when healing and remodeling of collagen were already established.¹⁹⁻²²

Generally, in the first session patients did not report any discomfort; however, in the second session (third postoperative day), some patients reported hypersensitivity, mainly in the submammary fold. In the following sessions, patients did not complain of discomfort.

Currently, I have modified the number of sessions and the schedule of application as follows: session 1, 7 days after surgery when removing the stitches; session 2, 15 days after surgery; session 3, 21 days after surgery.

This new protocol avoids the hypersensitivity that some patients had in early sessions by starting treatment when the capsule around the prostheses is already constituted.¹⁹⁻²¹

It has been almost a year and a half since I began using this prophylactic protocol, and the preliminary results demonstrate faster reduction of edema and inflammation, faster absorption of small bruises and ecchymoses, and a decrease of postsurgical discomfort. Most important is that from the first patients receiving this treatment to the current patients, none has experienced the formation of capsular contracture thus far.

In view of these good results, I have followed this protocol and improved its design, and I look forward to statistically validating the different variables. At the moment, I am carrying out both protocols in parallel: therapeutic and prophylactic. Therapeutic results are quite encouraging and prophylactic results fulfill our expectations so far. ■

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