

celluma® INNOVATION FOR TREATMENT OF CAPSULAR CONTRACTURE

Breast augmentation is one of the most common cosmetic surgical procedures performed in the world. In fact, the American Society of Plastic Surgery statistics report breast augmentation to be number one surgical procedure performed in 2017 with over 300,000 procedures performed a year.¹ One of the possible complications and a major contributor to dissatisfaction is capsular contracture. Capsular contracture is thought to be due to a chronic inflammatory process in the implant pocket, which converts a normal foreign body response to a pathologic response.²⁻⁴

The treatment of capsular contracture can be divided into non-surgical and surgical options. Non-surgical modalities to reduce the rate of capsular contracture include but are not limited to high dose vitamin E,⁵ use of medications such as Zafirlukast^{6,7} (Accolate) and Montelukast (Singulair)⁸ or herbal medicine such as Milk Thistle^{9,10} as well as external ultrasound¹¹⁻¹³. Although I have had some success with these therapies, the results have been inconsistent.

The use of Low Level Light Therapy (LLLT) for reducing pain, inflammation and edema, promoting healing of wounds, deeper tissue and nerves, and preventing tissue damage has been known for many years. The US Food and Drug Administration first approved low-level laser therapy for the treatment of lymphedema in 2006¹⁴. In 2013 I attended a talk of a colleague cosmetic surgeon describing incidental reduction of grades III and IV capsular contracture in two patients that were being treated with low-level laser for post mastectomy lymphedema. He was using the hand held device from RianCorp LTU-904 delivering a controlled series of bursts (200 ns) of near-infrared (904 nm) laser beam pulses.

Having learned all of these effects of low-level laser, I set out to find a device that would be practical for the treatment of capsular contracture. I wanted the device to be easy to use, economical and practical for our practice and patients. The device I found was the Celluma by BioPhotus. My aesthetician was already using it for our Acne patients. The Celluma has 345 light emitting diodes that emit energy at blue (465 nm), red (640 nm) and near-infrared (880 nm) wavelengths with frequencies of 80 Hz, 680 Hz and 800 Hz respectively for a duration of 30 minutes per treatment. The device comes programmed with multiple operating modes for each clinical application.

Two key clinical advantages to this device are the flexibility and ease of adaptation to the contours of the breasts as well as the preset "aches and pains" mode that uses both red and near-infrared wavelength for 30 minutes of treatment.

We use the Celluma device in two scenarios in the practice: One as a non-surgical option of treatment at the first sign of encapsulation and tightening of the breast implant pocket (Group 1) and second as postoperative management after a capsulectomy and re-augmentation (Group 2).



Our patients are educated about the risk of developing capsular contracture at the initial consultation and the importance of starting conservative therapy as soon as possible. We further explain that the earlier the treatments are started, the higher the rate of success in softening the breast and preventing the need for further surgery.

Since the etiology of capsular contracture may be multifactorial and related to inflammatory changes, our conservative protocol combines multiple modalities as well. Our protocol includes:

1. Milk Thistle 1000 mg twice a day for 3-6 months
2. Low level laser light treatment with the Celluma 2-3 times a week for 12 weeks

We are in the process of reviewing our data for the past two years. In the first Group of non-surgical treatment of capsular contracture, we treated 9 patients that developed significant capsular contracture with Baker classification of II-IV. Seven out of nine patients had improvement in at least one Baker Grade level (78%) and therefore did not seek surgical re-treatment. In the second group, six patients with symptomatic capsular contracture grade III-IV, were treated surgically with capsulectomy, implant exchange followed by low level laser light treatments and milk thistle 1000 mg BID for 3 months. All six patients have remained soft and have been able to avoid recurrence of capsular contracture within the first 6 months. We are continuing to follow up all of these patients.

It is well known and published by many authors including Dr. Wan and Dr. Rohrich that the rate of re-encapsulation after initial surgery can be 20-50 %¹⁵. In our experience, the use of low level laser therapy with Celluma in combination with anti-inflammatory therapy with milk thistle has dramatically reduced the rate of operation for capsular contracture upon initial diagnosis and the rate of recurrence after the initial capsulectomy surgery. We have not yet used low-level light therapy as a prophylactic measure. It is my hope that in the future we will be able to conduct a study that will measure the effectiveness of the LLLT in prevention or reduction of capsular contracture altogether.

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REFERENCES:

1. <https://www.plasticsurgery.org/news/press-releases/new-statistics-reveal-the-shape-of-plastic-surgery>
2. 4. Wan D, Rohrich RJ. Revisiting the management of capsular contracture in breast augmentation: a systemic review. *Plast Reconstr Surg.* 2016;137(3):826-841.
3. 5. Adams WP Jr. Capsular contracture: what is it? what causes it? how can it be prevented and managed? *Clin Plast Surg.* 2009;36:119-126, vii.
4. 6. Berry MG, Cucchiara V, Davies DM. Breast augmentation: Part II—adverse capsular contracture. *J Plast Reconstr Aesthet Surg.* 2010;63(12):2098-2107.
5. Baker JL Jr. The effectiveness of alpha-tocopherol (vitamin E) in reducing the incidence of spherical contracture around breast implants. *Plast Reconstr Surg.* 1981;68(5):696-698.
6. Schlesinger SL, Ellenbogen R, Desivigne MN, Svehlak S, Heck R. Zafirlukast (Accolate): a new treatment for capsular contracture. *Aesthet Surg J.* 2002;22(4):329-336.
7. 81. Schlesinger SL, Heck RT. Letter to the editor: a new treatment for capsular contracture. *Aesthet Surg J.* 2002;22(2):164-165.
8. Huang CK, Handel N. Effects of Singulair (montelukast) treatment for capsular contracture. *Aesthet Surg J.* 2010;30(3):404-410.
9. Abenavoli L, Capasso R, Milic N, Capasso F. Milk thistle in liver diseases: past, present, future. *Phytother Res.* 2010;24(10):1423-1432.
10. 86. Flora K, Hahn M, Rosen H, Benner K. Milk thistle (*Silybum marianum*) for the therapy of liver disease. *Am J Gastroenterol.* 1998;93(2):139-143.
11. Herhahn FT. Ultrasound and capsular contracture. *Plast Reconstr Surg.* 1984;74(4):574.
12. Planas J, Migliano E, Wagenfuhr J Jr, Castillo S. External ultrasonic treatment of capsular contractures in breast implants. *Aesthetic Plast Surg.* 1997;21(6):395-397.
13. Planas J. Prophylactic use of external ultrasound for breast implant capsular contracture. *Aesthet Surg J.* 2002;22(2): 205-207.
14. Omar MT, Shaheen AA, Zafar H. A systematic review of the effect of low-level laser therapy in the management of breast cancer-related lymphedema. *Support Care Cancer.* 2012;20:2977-2984.
15. Wan D, Rohrich RJ. Revisiting the management of capsular contracture in breast augmentation: a systemic review. *Plast Reconstr Surg.* 2016;137(3):826-841



FIGURE 1, BEFORE. 52-year-old one year after breast augmentation with right capsular contracture.



FIGURE 1, AFTER. 52-year-old 6 months after 24 low level light therapy and Milk Thistle with complete resolution of capsular contracture without surgery.



FIGURE 2, BEFORE. 34-year-old two years after breast augmentation with bilateral capsular contracture Baker IV.



FIGURE 2, AFTER. 34-year-old 6 months after capsulectomy, re-augmentation followed by low-level light therapy and milk thistle with maintenance soft breasts Baker I and avoidance of capsular contracture.