

Non-Surgical Fat Reduction using the CoolSmooth Conformable Surface Cryolipolysis Applicator

W. Grant Stevens, MD, FACS

As published in Plastic Surgery Pulse News, Volume 6, Number 2, 2014.

http://www.plasticsurgerypulsenews.com/18/article_dtl.php?QnCategoryID=174&QnArticleID=351&QnCurPage=1

Dr. Stevens is the Director of Marina Plastic Surgery, Clinical Professor of Surgery, Director of the Aesthetics Division of the University of Southern California (USC) Division of Plastic Surgery, and the Director of the Marina del Rey - USC Aesthetic Surgery Fellowship.

Introduction

Cryolipolysis is a safe and effective procedure for non-surgical reduction of subcutaneous fat. Cryolipolysis (CoolSculpting System, ZELTIQ Aesthetics, Pleasanton, CA) utilizes controlled cooling to selectively damage adipocytes. Since adipocytes are uniquely sensitive to cold, fat cells can be frozen without inducing damage to overlying skin and surrounding muscle, nerves, and blood vessels. Controlled cold exposure subsequently induces apoptosis in the adipocytes and an inflammatory response in treated tissue. The damaged adipocytes are gradually removed by the body's immune system, resulting in permanent fat layer reduction in the treatment area.

Cryolipolysis received FDA clearance for treatment of the flanks, abdomen, and thighs. The procedure has also been used for off-label treatment of undesirable fat in areas such as the back, arms, and male chest.⁽¹⁻⁵⁾ Areas with easily "pinchable" subcutaneous fat can be treated using vacuum cryolipolysis applicators to pull the targeted tissue between parallel cooling plates. Areas such as the lateral thighs, however, have fibrous fat and cannot be treated using vacuum applicators. This article describes a new non-vacuum cryolipolysis applicator (Figure 1) which allows non-surgical reduction of fat in fibrous areas, such as lateral thigh saddlebags and upper abdomens, which previously could not be treated by cryolipolysis.



Figure 1: Conformable surface cryolipolysis applicator reduces subcutaneous fat without vacuum suction.

The Marina Experience

The Marina experience with cryolipolysis has been extremely positive. The first system was purchased in 2009 when non-surgical fat reduction was in its infancy and we were unsure how cryolipolysis would contribute to our plastic surgery practice. Very quickly, we realized that patients were eager to explore non-surgical procedures not just for their faces but for their bodies, too. Our cryolipolysis business grew and we added our second system in 2011; demand for non-surgical body contouring continued to increase, so we added our third system at the beginning of 2012 and our fourth at the end of 2012. Patient interest in non-surgical body contouring continued to increase and we added our fifth and sixth in mid-2013 and our seventh in 2014.

Marina Plastic Surgery now has five clinicians performing cryolipolysis with an average of over 100 treatment cycles per week. We are the top CoolSculpting practice in the US with over 10,000 cycles completed. Cryolipolysis has brought in new patients to the practice. In a patient retrospective, we found that 66% of our cryolipolysis patients were new to the practice; of these new patients, 62% were

aesthetic neophytes and 40% became established patients that received secondary and tertiary procedures. ⁽³⁾

Our clinicians have revolutionized the practice of cryolipolysis, developing the assessment and treatment method that became Treatment to Transformation, the non-surgical cryolipolysis treatment protocol that can produce higher patient satisfaction and results that rival liposuction. We have explored cryolipolysis for fat reduction not only in the abdomen and flanks, but also the inner thighs, arms, back, and male chest. We have successfully recontoured almost the entire body, but until a non-vacuum applicator was developed, we were unable to use cryolipolysis to treat fibrous, non-pinchable fat.

CoolSculpting the Whole Body

The conformable surface cryolipolysis applicator (CoolSmooth) addresses a previously unmet clinical need in non-surgical body contouring. Non-pinchable fat in areas such as the lateral thighs can be treated without vacuum suction by applying surface cooling from conformable cooling plates. As shown for a lateral thigh treatment in Figure 2, the patient's skin is covered by a protective gelpad, then the conformable surface cryolipolysis applicator is positioned over the saddlebag bulge on the lateral thigh and secured with a strapping system. Because the targeted fat can't be pulled away from the body by vacuum suction, the treatment duration is two hours to deliver sufficient cooling to the subcutaneous fat layer.



Figure 2: Lateral thigh cryolipolysis procedure shows placement of the applicator on the lateral thigh and secured with straps. A gelpad on the skin surface protects the skin from freeze injury.

Marina Plastic Surgery was a clinical study site for the new conformable surface applicator. Representative study subjects are shown in Figures 3 and 4. As shown by the clinical photographs, the

lateral thigh curvature has been visibly reduced four months post-treatment, resulting in a smoother contour. The cryolipolysis conformable surface applicator noticeably reduced undesirable “saddlebag” bulges.

As described in the resultant publication, the study of n=40 subjects found high safety and efficacy.⁽¹⁾ All side effects, such as erythema, mild swelling, and numbness, were minor and transient. Efficacy analysis showed that independent, blinded review found 87% correct identification of baseline and post-treatment clinical photographs.⁽¹⁾ Ultrasound image analysis found 2.6 mm mean normalized reduction in fat thickness, a statistically significant reduction when compared to the untreated control thigh.⁽¹⁾ Patient surveys found that 89% would recommend lateral thigh cryolipolysis to a friend; 86% were satisfied with the treatment; 86% noticed visible fat reduction; and 97% were likely to have a second treatment.⁽¹⁾

Since the conformable surface applicator was commercially launched, we have explored it for cryolipolysis treatment of not only the lateral thighs, but also medial thighs and abdomens. For subcutaneous fat that isn't readily pulled into a vacuum cup, the cryolipolysis surface applicator can be used for non-surgical body contouring. With the addition of the non-vacuum conformable surface applicator, the CoolSculpting applicator portfolio now provides options for non-surgically contouring the entire body.



Figure 3: Subject STE-002 received unilateral cryolipolysis treatment to her left lateral thigh; pre-treatment (A) and four months post-treatment (B). Weight change +4.0 lbs since baseline. *Procedure by Dr. W. Grant Stevens, Marina Plastic Surgery.*



Figure 4: Subject STE-005 received unilateral cryolipolysis treatment to her right lateral thigh; pre-treatment (A) and four months post-treatment (B). Weight change +1.0 lb since baseline. Procedure by Dr. W. Grant Stevens, Marina Plastic Surgery.

Conclusion

The new cryolipolysis conformable surface applicator provides safe and effective reduction of lateral thigh fat. Clinical study data demonstrate significant reduction of fat thickness and high patient satisfaction. The cryolipolysis conformable surface applicator noticeably reduced undesirable “saddlebag” bulges. In commercial treatments, we have also explored use of the CoolSmooth non-vacuum cryolipolysis applicator for treatment of the upper abdomen and inner thighs. The conformable surface cryolipolysis applicator and current portfolio of vacuum applicators allow safe and effective reduction of subcutaneous fat for the whole body. For patients that are reluctant to undergo surgery, cryolipolysis provides an alternative that may produce liposuction-like results.

References

1. Stevens WG, Bachelor EP. Cryolipolysis conformable surface applicator for non-surgical fat reduction in lateral thighs. *Aesthet Surg J*. 2014. [in press]
2. Boey GE, Wasilenchuk JL. Fat Reduction in the Inner Thigh Using a Prototype Cryolipolysis Applicator. *Dermatol Surg*. 2014. [in press]
3. Stevens WG, Pietrzak LK, Spring MA. Broad Overview of a Clinical and Commercial Experience with CoolSculpting. *Aesthet Surg J*. 2013; 33(6):835-846.
4. Sasaki GH, Abelev N, Tevez-Ortiz A. Noninvasive Selective Cryolipolysis and Reperfusion Recovery for Localized Natural Fat Reduction and Contouring. *Aesthet Surg J*. 2014; 34(3):420-431.
5. Dierickx CC, Mazer JM, Sand M, Koenig S, Arigon V. Safety, tolerance, and patient satisfaction with noninvasive cryolipolysis. *Dermatol Surg*. 2013; 39(8):1209-1216.