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CUTANEOUS MEDICINE FOR THE PRACTITIONER

REFERENCED IN *INDEX MEDICUS*

VOL. 107 | NO. 5S[j] | MAY 2021 | mdedge.com/dermatology



NEW
Approaches in
Managing Cellulite:
EXPERT INSIGHTS

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doi:10.12788/cutis.0208

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CME / ABIM MOC / CE
Release Date: 4/1/2020
Expiration Date: 4/1/2021

Target Audience: This activity is intended for plastic surgeons, aesthetic medicine specialists, dermatologists, nurses, and other healthcare professionals who treat and manage patients with cellulite.

Goal Statement: The goal of this activity is to increase knowledge on the pathophysiology and burden of cellulite and treatment options for patients with cellulite.

Learning Objectives: After participating in the activity, the plastic surgeons, aesthetic medicine specialists, dermatologists, nurses, and other healthcare professionals who treat and manage patients with cellulite should be able to:

Have increased knowledge regarding the

- Mechanism of action of new/emerging treatments for cellulite

Have greater competence related to

- Individualizing cellulite treatment regimens based on patient-related factors

Disclosures: Faculty, Editors, CME/CE Reviewer/Nurse Planner, Peer Reviewer

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Disclosure: Michael S. Kaminer, MD, has disclosed the following relevant financial relationships:

Served as an advisor or consultant for: Arctic Fox; Candesant; Endo; NC8; Soliton

Received grants for clinical research from: Allergan; Arctic Fox; Endo Pharmaceuticals Inc.; Evolus; Galderma; L'Oreal; NC8; Soliton

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New Approaches in Managing Cellulite: EXPERT INSIGHTS

INTRODUCTION

Cellulite affects up to 85% of women.^{1,2} Unlike generalized obesity, cellulite is a non-pathologic condition that the medical community has defined as normal.¹⁻⁴ However, cellulite is associated with social stigma and low self-esteem.^{4,5} Increasing evidence demonstrates that cellulite is a complex phenomenon attributed primarily to the subcutaneous tissue structure in women.⁴

How is increased understanding changing the way we think about cellulite?

Historically, we've described cellulite as bumpy or uneven skin texture, primarily on the legs and buttocks, resembling an "orange peel" or "cottage cheese."^{1,6} However, that doesn't tell the whole story, and the "orange peel" and "cottage cheese" terminology we use really refers to different depths of the same underlying pathology. There is a structured pattern of cellulite development that ranges from shallow and a few dimples, to deeper and more dimples. This combination of depth and number of dimples influences the appearance of cellulite. When you have a lot of shallow lesions, we might say it looks like an orange peel. When you have a lot of deeper lesions that undulate, we might call it cottage cheese. The terminology we've been using was a type of shorthand to describe something that we didn't fully understand. But now we're starting to refine our understanding of the nuances of cellulite, and the discussion about etiology and treatment is advancing.

In the past, techniques to quantify or measure cellulite were disjointed, and it was difficult to tell whether anything truly worked. With a shift in the way we think about cellulite, we have an opportunity to speak the same language and really understand whether a treatment works. Two validated grading scales have been published recently: one for cellulite, and the other for skin laxity.^{3,7} In addition, there are several cellulite-grading research scales, in particular the Cellulite Severity Scale (CSS),

that have enabled the scientific community to improve analysis of data. The CSS describes cellulite more precisely based on the depth and the number of dimples, rather than simply calling something cellulite as if it's a giant black box.⁸ By helping us to define and rate cellulite, grading scales like these give us a consistent nomenclature that can guide us as we think about treatment selection.

Who are the patients seeking treatment for cellulite?

Early on, most of the people we were seeing for cellulite consults had heard something from a friend or in the media or were just so bothered by their cellulite that they wanted to explore literally any options. Because of the limited efficacy and options for prior treatments, there wasn't a flood of patients seeking treatment. However, now that there is more information about treatment options in the community, on the internet, and in other places, more people are asking us about cellulite treatment options. They tend to trend younger, between their late 20s to late 40s, but we have also seen women well into their 50s and 60s who have concerns. The majority of people who come in have relatively good skin quality and are bothered by their cellulite. They may have a little bit of rippling, dimples on their backside/buttocks, and maybe some waviness/dimples on their outer thighs, and they just want to make that better or smoother.

What does our new knowledge tell us about the pathophysiology and etiology of cellulite, and how does that help determine targets for treatment?

When I think about cellulite and how to treat it, I think of three "camps" focused on the 3 key tissues involved.⁹ Historically, there was the dermal camp, which said that cellulite was all about the skin. Unfortunately, topical creams and other agents meant to improve the

skin have not worked very well, indicating that the dermis is not the primary target for cellulite treatment efficacy. Then there's the camp that says that fat is the primary etiology, pushing up through the dermis and creating bumps in the skin.⁹ The contribution of fat to the appearance of cellulite is supported by some of our early work on controlled-depth subcision. In that research, cellulite improved with treatment in women whose weight remained relatively stable but tended to worsen over time among women who gained 10 pounds or more. Unfortunately, the fat-reducing technologies, such as liposuction or noninvasive fat removal, do not typically improve cellulite and in some cases can make it look worse. This suggests that fat accumulation may be permissive to the appearance of cellulite, but neither skin/dermis nor fat are the optimal targets for cellulite treatment.

The third camp focuses on fibrous septae. About 10 years ago, elegant work by Hexsel et al showed an association between cellulite depressions on the buttocks and the presence of underlying fibrous septae.⁸⁻¹⁰ We later found that when you treat the fibrous septae, cellulite starts to look better.^{4,9} Based on

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these findings, cellulite theory has evolved to focus on the fibrous septae, both as a therapeutic target and as the etiology for cellulite. While the dermis and fat certainly contribute to the appearance of cellulite, fat protrusion into the dermis appears to be secondary to the continuous and progressive tension placed on the septae.⁹

This relationship between fibrous septae and fat distribution might be one explanation for the association between weight gain/fat accumulation and cellulite, particularly with advancing age in women.¹¹ When we're younger, the fibrous septae are more flexible. They move and stretch and elongate as we gain or lose weight. But as we get older, the fibrous septae tend to become stiffer. As fat changes and/or accumulates, the fibrous septae don't move as freely as they did during youth. This is particularly true for women, where dermal support, septal morphology, and underlying fat architecture are different from those in men.¹¹ In this theory, fat is not causing the

cellulite, but rather it's highlighting the pathology in the fibrous septae.⁹

So, there's compelling evidence that fibrous septae are the primary cause of cellulite and may be our best target for improving cellulite. But that's not to say that fibrous septae are the only target. Cellulite is multifactorial,⁶ and treating cellulite is a big tent where there's room for all camps. Every time we treat somebody with cellulite, it is important to think about all three of these component—skin, fat, and fibrous septae—and how to target them.⁶

How do you address the skin?

It is obviously important to promote good skin care as a primary strategy for overall skin health, which would include the topical approach to cellulite. It's beneficial to keep skin well hydrated and to avoid as much sun exposure as possible over the years. That will help keep the dermis at its maximal thickness. We know that dermal thinning, which happens naturally with age,⁹ contributes to the appearance of cellulite. Basic skin care is a reliable way to target the dermis, and we can give topical agents to improve skin quality.^{1,6} Retinols, glycolic acids, hyaluronic acid moisturizers, and even general moisturizers can be helpful. However, treating the skin alone rarely improves cellulite,^{1,6} unless the patient has "orange peel" cellulite, where you see multiple but shallow cellulite dimples. In that case, adding hydration can make the dimples appear shallower, which makes the skin look a little bit better.

We can also work on skin laxity through skin-tightening approaches. Skin laxity is more of a neighbor to cellulite than a component of it, but you can treat it while you're addressing the cellulite. Ultrasound and radiofrequency tighten the dermis (and in some cases fibrous septae), which can make the skin surface look better and smoother.⁶ But again, that's for shallow dimples or when there is direct evidence of laxity. In the author's experience, skin-tightening doesn't work as well for deep dimples.

How do you address fat?

If a patient is overweight, it helps to ask them what their normal/comfortable weight is. The goal is to know where they are relative to their normal. If the patient is more than 10 pounds over their comfortable weight, then we build weight loss into their treatment program. That doesn't mean that we send them away and tell them to come back when they've met their goal. Rather, it helps to explain that we need their help with the fat while we work on the other components of cellulite, the primary one being the fibrous septae. It is rarely advisable to target fat as a mechanism to treat cellulite. A slimmer anatomy might have its own benefits in terms of appearance, but fat reduction is not a reliable strategy for improving cellulite.

What treatment approaches target the fibrous septae?

There are three primary ways to disrupt the fibrous septae: direct subdermal, chemical, and transcutaneous.

Direct subcision can be done either manually, with or without tissue-stabilized guidance, or by laser.⁶ Subcision is effective on the buttocks or thighs, and it tends to work best on individual, discrete lesions. Published data demonstrate that tissue stabilized-guided subcision tends to work the most predictably, with an impressive longevity of results beyond 5 years.^{1,4,12} When the tissue is stabilized, subcision can be done at a precise depth of 6 to 10 mm, whereas manual subcision involves guessing at the depth.^{4,9} Laser subcision is also highly effective, and it can be long-lasting, but it requires a skilled operator's hand and more invasive surgery.¹³

The second way to disrupt the fibrous septae is by chemical subcision with collagenase *Clostridium histolyticum*.^{1,14} Chemical subcision tends to work better on discrete and slightly shallower lesions, but it can be used for both shallow and deep lesions. It works reasonably well on the buttocks and the thighs, and there is fairly solid data on its efficacy.^{10,15} Chemical subcision requires multiple treatments, but it doesn't require surgery. It's a relatively simple injection, which will be easy for most doctors to adopt.

The third option involves acoustic waves for therapeutic acoustic subcision. Rapid acoustic pulse (RAP) waveforms are short duration pulses with a high peak power and appear to be optimal for creating acoustic subcision. Although RAP is FDA approved for the treatment of tattoos, it is still under investigation for cellulite as a device-based treatment approach. The advantage of acoustic subcision is that it does not require an injection or surgery. There are no needles, and there is no recovery time. It is not yet clear what types of cellulite acoustic subcision are best for.

Importantly, not all acoustic waves are the same. The quality and design of the acoustic wave form appears to have a significant impact on efficacy. Long-pulsed acoustic waves (shock waves) have been in the marketplace for years and are used as adjuncts to several common cosmetic procedures, including cryolipolysis. However, these longer-pulse durations do not appear to have the optimal peak power and waveform to reliably impact fibrous septae and cellulite.

Are there other new and emerging treatments for cellulite?

We also have injectable fillers,^{1,6} which do not fall into any of the three buckets to treat fibrous septae. We can use subdermally placed fillers to improve cellulite without focusing directly on the etiology, and they can work very well. Many injectors prefer to use hyperdilute poly-L-lactic acid, but others use dilute calcium

hydroxyapatite. Rather than target skin, fat, or fibrous septae, fillers camouflage the cellulite. They can be used for shallow or deep dimples on the thighs or buttocks. In some cases, injectable fillers can also improve the appearance of laxity. One downside, however, is that fillers typically last only 1 to 2 years. On balance, fillers are a powerful tool in our cellulite treatment arsenal.

Occasionally, fillers can be used as a standalone treatment when the cellulite does not quite fit with the available treatments we have. However, fillers are also powerful as an adjunct to treatments directed at the

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fibrous septae.⁶ A preferred approach for combination therapy is to treat the fibrous septae first, see how things look after 3 to 6 months, then use a filler product in places that require additional smoothing.

Recently, radiofrequency (RF) microneedling has been investigated as a tool to improve the appearance of cellulite. RF is known to improve skin laxity, but early evidence suggests that RF delivered through microneedles may improve the appearance of cellulite at the same time that it improves skin laxity.^{15,16} This is an evolving area of research.

How has the COVID-19 pandemic changed how you treat cellulite?

Obviously, all of our practices have been significantly impacted by COVID-19, and managing the pandemic is a daily challenge. At our practice (SkinCare Physicians, Chestnut Hill, MA), we have robust guidelines and protocols in place for patient and staff safety, and our patient-facing staff wear robust personal protective equipment. We continue to treat patients with a myriad of general and cosmetic dermatology concerns. Although the number of patients we see is reduced because of COVID-19 restrictions, many of our patients are eager to do something positive for themselves. Whether it be minimally invasive tissue stabilized-guided subcision or subdermal fillers for cellulite, these procedures can be done safely and effectively with proper safety protocols in place. As we evolve from the pandemic, and anew treatment options come on line in 2021, our patients will have a variety of safe and effective treatment options for cellulite.

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