

**OPINION**

# The Aging Face: A Different Perspective on Pathology and Treatment

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*Probably because the thrust of the pathology of the aging face has been attributed to the effects of gravity (skin and muscle loosening and falling), treatment of such is generally directed toward lifting procedures. Indeed, results from such procedures are generally beneficial, but in many cases the patient appears unnaturally skeletonized. A brow-lift may eliminate some wrinkles and frown lines, but does anyone (naturally youthful) really have eyebrows a centimeter above the orbital rim? Our goal has been, and continues to be, to strive for excellence, and in the case of the aging face, this would be an improved and more youthful appearance. This paper will discuss the main pathology of the appearance of aging, which is the general dissipation of facial fat over time. It will also provide discussion as to thoughtful correction of the problem not only with lifting techniques but also with consideration to filling procedures. The judicious use of fat-grafting and various synthetic implants serve as the principal tools for volume correction. It is acknowledged that the skin undergoes photo-damage, which also contributes to the appearance of aging, but this is treated by treating the skin in a multitude of ways.*

Over the years I've observed the results of the "best" face-lifts and eyelid procedures only to wonder why these patients don't look like they did when they were young. If this is rejuvenation surgery, why don't the patients look rejuvenated? They may look better than they did preoperatively, but they don't look as well as they did when they were younger. If aging is a result of gravity pulling the tissues inferiorly, then why don't our patients look like their old selves again when we lift and "correctly" reposition these tissues? When eyelid surgery is routinely performed, "excess" skin and fat are typically removed, but that leaves deep hollows over the eye and a circle (nasojugal fold) under the eye. When you look at youthful eyes or at models, one generally doesn't see these extra demarcations.

It's with this in mind that I have constructed this paper. It is clear that our efforts in cosmetic facial surgery for the aging face have been directed toward the

ultimate lifting technique. From the skin lift to the subcutaneous myo-aponeurotic system (SMAS) plication or imbrication, from the deep plane or composite to the subperiosteal lift, and from the coronal to the endoscopic forehead lift, we have lost consideration for what actually should be attributed to the problem of the appearance of aging. This is because we have been notoriously content to accept the articles and the theses printed by our noble guardians of the scalpel as though their words have been handed down in stone.

Many a paper on the aging face extols the power of gravity, which is blamed for the sagging of our facial tissues. The works that have been devoted to the unconquerable nasal labial fold are united in their opinions on gravity. Not only is gravity blamed for the downward descent of the skin, but in the case of the nasal labial fold, it supposedly pulls down an entire malar fat-pad, causing it to settle in the proximity of the fold with advancing age.<sup>1-8</sup>

A review of Knize's exhaustive work on the mechanism of eyebrow ptosis focuses on the multiple levels of the frontalis and brow suspensory tissues, and though there is some mention of the presence of fat around the brow and galea, it is only discussed in terms of how gravity pulls the tissues down over these fat layers.<sup>9</sup>

As I ponder the wonders of the gravitational effects on the face, I'm left in a quandary as to why gravity is so selective. After all, why aren't our kidneys sagging down to our pelvis? Shouldn't I need some type of support or operation to prevent my knee caps from sliding down to my ankles? Why does my gallbladder remain nestled in that warm spot of my liver? Isn't gravity nondiscriminatory? It's not unlikely that most of the people reviewing this paper can barely touch their toes. So why should the facial tendons all become looser while the rest of the body seems to stiffen up? Since none of these tendons, muscles, veins, and arteries are affected by gravity the way our faces are, I'm inclined to believe we have a problem with selective conceptualization. Indeed, since these highly regarded studies on the downward drift of the facial structures state that this descent is a result of stretching and laxity of these muscle, fascial, and tendon structures, how come there are no studies that actually demonstrate an increase in lengthening?<sup>10</sup> I think we've

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**Figure 1.** Photos from Yousif et al<sup>6</sup> show subject in her twenties and in her sixties. While first glance seems to reveal thickening of the nasal/labial folds, thoughtful observation reveals marked decrease in facial volume resulting in thinning over the temporal areas, the cheeks, and particularly around the mouth and mandible. Photos from "The nasolabial fold: a photogrammetric analysis," by NJ Yousif et al in *Plast Reconstr Surg* 1995;93(1):73. Reprinted with the permission of William and Wilkins.

been complacent in our thinking and have simply continued to accept what we have been told for years without hollering, "The Emperor's got no clothes."

Our reasoning has been flawed. Gravity is not the cause of the problem; it merely allows us to see the effects of the problem (although if you're supine, it doesn't look so bad). While there are definitely skin changes due to photo damage, this does not account for the most significant changes of aging. Indeed, the predominate pathology to the appearance of aging is due to loss of volume underneath the skin envelope. The predominant component of that volume loss comes from the dissipation of fat.<sup>11</sup> Within the face there is subcutaneous fat, perimuscular fat, and buccal fat. Other volume decreases, such as bone loss (other than that resulting from dental extraction), is relatively minimal.

In a review of the aging face and the nasal labial fold, Yousif et al compiled photographs of several people demonstrating their appearance over four decades.<sup>6</sup> By taking the photographs and imaging them onto my computer, I was able to adjust for the different focal lengths by matching up fixed facial structures such as the eyes and mouth. Subjective and objective determinations can be made about the changes in appearance. While first glance leads one to believe that some of the people have gained weight with aging, it is clear that there is considerable thinning of the entire face, most obviously around the temporal area and the mouth (Figure 1).

While the nasal labial fold appears thickened in every image, it is not. Rather, this is a manifestation of a diminution of facial fat, principally, the buccal fat-pad. The nasal labial fold needs better understanding. The fold itself is marked by three labial muscles that connect between the lip and the fold, providing direct traction. Also at the corner of the mouth is the modiolus, which connects to several facial muscles.<sup>12-14</sup> In simple terms, the nasal labial fold is analogous to any other fold on the body, such as the inframammary fold. When a breast is youthful and full, it may not even fall over the inframammary fold, but with advancing age and loss of volume, the breast appears to sag over the inframammary fold. Is that fold caused because the breast now has more tissue at the fold site? According to an evaluation of the nasal labial fold using MRI in a study by Gosain et al, it is noted that there is thickening, or fat accumulation, in the area of the fold in the aging face.<sup>15</sup> The study was done with subjects who were placed in a 30° forward tilt. If you were to examine a breast with the subject lying supine, there would be little tissue falling over the inframammary fold. However with the subject standing up and leaning forward, there would be a considerable amount of tissue falling over the fold. Would one then conclude that there was more breast tissue at the fold, or is it the lack of supporting volume that causes the breast to sag and appear as if there was an inferior displacement of tissue? If the breast is augmented, there is a lift of the tissues and, subsequently, less tissue falling at the level of the inframammary fold. For most cases, it is clear that the loss of volume creates the appearance of the fold. The same is true in the face. Recently, we've seen some indication of support for this position. Many of the malar implants are now wider and fuller, looking to more adequately fill some of the facial volume, partly diminishing the harsh nasal labial fold.

In a review of the buccal fat compartment, Stuzin et al demonstrated the extensive nature of this contiguous fat pad.<sup>16</sup> The buccal fat compartment extends throughout the malar area and up under the temporalis muscle. It essentially envelops all of the musculature of the middle one-third of the face, mainly the muscles of mastication. In a demonstration of how 2 and 3 g of fat removal (per side of face) can help highlight the cheekbones and chisel out the face, the authors have effectively added several years to the patient's face (Figure 2). The patient's chiseled "after" picture demonstrates retrusion of the temporal area, sharp circles under the eyes, and the increased appearance of the nasal labial folds.

Some surgeons have taken the position that 9 to 12 months following a face-lift procedure, it may be advantageous to perform a sequential "tuck," thereby tightening the tissues that have sagged following the healing process and the effects of swelling. Indeed, the key factor, swelling, should lend further support to my premise. The patients generally look good within weeks of their operation precisely because of their swelling (Figure 3). As the swelling diminishes, there



**Figure 2.** These “before” and “after” photos from Stuzin et al<sup>16</sup> represent a patient who had buccal fat extraction (2 g removed from the right and 3 g from the left). While the authors point out the improvement in her appearance, it is also notable that now there appear to be pronounced recesses at the temporal area, the nasojugal fold, and the nasal/labial folds. These are all signs of advanced aging. Photos from “The anatomy and clinical application of the buccal fat pad,” by JM Stuzin et al in *Plast Reconstr Surg* 1990;85(1):36. Reprinted with the permission of William and Wilkins.

is less facial volume and a relative excess of skin. Again, this should logically demonstrate the importance of restoring facial volume for the improvement of the aging face vs. simply continuing to pull, which only serves to reduce the envelope of skin over the face.

Let’s consider the aging eyelids. Again, we have passed on the traditional concepts repeatedly: excess skin, herniated or pseudoherniated intraorbital fat, and drooping, lax brow and forehead tissues.<sup>17</sup> Again, it is curious to wonder how gravity is so selective with the eyelids. Why does the orbit have increased amounts of fat, and why would it herniate above as well as below the globe? One might argue that the pressure of the eye might, over time, force some of the fat out, or perhaps there is some fat accumulation over time, but there is a more logical explanation. As fat dissipates around the brow, around the forehead, and around the buccal fat compartment, there’s less of a cushion supporting the skin over the underlying fixed skeletal structures. Ultimately, we are able to visualize the underlying compartment of the orbit (Figure 4).

There may not be any wrinkles on the forehead when you get done with the endoscopic brow-lift, but beautiful eyes are not hollow and cadaverous in appearance. In an article by Freund and Nolan, they evaluated eyelid and eyebrow position for optimal aesthetic appearance.<sup>18</sup> They concluded that the results



**Figure 3.** This patient is seen preop, 1 week postop, and 4 weeks postop. She underwent a face-lift (subcutaneous myo-aponeurotic system imbrication), lower blepharoplasty, and facial fat-grafting. At 1 week, there is still significant volume from fat grafts, swelling, and residual, nonsurviving fat-grafts. At 4 weeks, the swelling and dead fat has resorbed. To achieve her 1 week postop look, she would need more volume, not more pulling.

that were consistently published by surgeons extolling their procedures were not aesthetically optimal. However, these were the procedures that were set and accepted as the standards among the surgical community.

So, if the appearance of aging is primarily a result of loss of volume, how should we treat the patient?



**Figure 4.** This patient underwent traditional blepharoplasty on the upper and lower lids. She had two other procedures on the left lower eyelid, trying to remove or tighten the fold under her lid. Five months following facial fat grafting, the defect has been neutralized.



**Figure 5.** This patient had significant facial fat volume loss, which made her features look long and flat and discordant with her petite frame and perky personality. Following several fat-grafting procedures and a rhinoplasty, she maintained the softer features consistent with a more feminine appearance.



**Figure 6.** This patient underwent a face-lift and lower lid blepharoplasty with fat transposition down onto the orbital rim and facial fat grafting. Note, there was no upper lid blepharoplasty, only fat grafting, which effectively filled out her brow and improved her eyelid appearance.

The obvious answer is volume replacement. This may currently be accomplished several ways. There are permanent implants that are available. These include malar, combined submalar, or malar-shell type implants. Chin implants, especially the wider wraparound implants, are useful in providing a permanent fill. Various forms of e-PTFE (expanded-Polytetrafluoroethylene, or Gore-Tex<sup>TM</sup>) are now being used to fill in selected areas, particularly around the lips. Also, we can utilize fat-grafting techniques.

Over the years, I have found that the fat-grafting technique, when applied with or without lifting procedures, can be most gratifying (Figures 5 and 6). It is, however, a suboptimal procedure, at least in most doctor's hands, mine included. Nonetheless, as chronicled in the literature, fat has been used in various forms as a filling material as far back as the late 1800s.<sup>19</sup> There are several variables that make this procedure a little tricky. First, it is a purely artistic procedure, requiring the doctor to literally sculpt the patient from the inside out. Secondly, it requires a fat source of significant size for use as a donor site. Finally, it requires revascularization of the freely grafted fat cell.

Learning where and how to artistically place the fat can be achieved with practice and understanding of what we are trying to achieve. Donor sites are usually available in most people and some doctors favor frozen fat as a source for later injections.<sup>20</sup> The possible advent of fat culturing may eventually offer a way of producing fat for the lipid-challenged individual. The most difficult variable, gaining optimal survival, may

be enhanced by optimizing technique or possibly by other adjunctive procedures yet to be discovered.

A majority of the problems connected with fat grafting have been related to the manner in which it has been injected. Coleman has written and taught extensively about this problem.<sup>21</sup> Over the years, ratchet type injecting devices have been sold in order to power the fat through a 10-cc syringe into a 16-gauge needle. This is extremely harmful to the fat cells because of the excessive pressure that is used to eject the fat from a wide-diameter cylinder into a relatively narrow cylinder. This is the basis of Bernoulli's principal. In agreement with Coleman, we generally use tuberculin (TB) syringes (rarely 3 cc) and 18-gauge needles or the blunt Coleman cannula to inject the fat. Very little pressure is thus exerted, and the fat is more safely transferred to the recipient site.

Though Coleman presents an excellent didactic in his view on handling fat, there are indications that fat is not as fragile as we are led to believe.<sup>22-25</sup> The optimal techniques for grafting will likely be elucidated as the procedure and the understanding of the need for optimal filling techniques gain popularity and interest, particularly in the academic setting.

My basic technique for fat grafting requires harvesting the fat using a 10 or 60-cc syringe and a 3-mm cannula, cleaning the fat with saline and then re-injecting it through a TB syringe and an 18-gauge needle or one of the blunt-tipped Coleman needles. I have tried various techniques for preparing the fat, such as centrifuging as described by Coleman, but I am still uncertain as to its real benefits. As noted in a recent article by Jones and Lyles,<sup>22</sup> fat harvested by the sim-

ple technique we use was quite viable and able to be cultured.

I tend to inject low to moderate quantities of fat during a given procedure, averaging around 20 cc per case. This seems to minimize the postoperative swelling, allowing the patient to look fairly normal within 1 to 2 weeks. I generally quote 30% survival rates based on information from some simple studies. These does, however, seem to be better survival in the periorbital area as opposed to the more mobile areas around the mouth and the lips. This would suggest that two or three additional procedures may be necessary to optimize the result. Some surgeons place larger quantities of grafted fat and get more persistent swelling, but may have more optimal results subsequently. Again, the technique is in evolution, but at least there is a clearer understanding of the problem.

It is not the point of this paper to argue against the face-lift procedure. The procedure is still quite expedient, even though we must honestly admit it is helping to accomplish our goal in an indirect way. Lifting procedures may also be useful in changing one's appearance to make it more attractive. For example, a woman with a long face may actually soften and round her face to make it more attractive with a lift. Conversely, for the same reason, a male face-lift can be somewhat feminizing in its result. And when lifting procedures are accomplished to their maximum effect, especially in older, thinner individuals, without regard to filling, the results are cadaverous and are certainly not rejuvenating. On the other hand, resurfacing procedures, whether they be laser treatments or peels, are directed toward repairing photo-damaged skin. Likewise, they too can be combined with filling procedures.

In summary, the ideal rejuvenating procedures are going to use filling techniques, alone or in combination with more traditional lifting procedures or perhaps skin resurfacing, to correct the unattractive signs of aging caused by the natural losses of facial fat volume and photo damage. This paper represents a simple challenge to the long-held beliefs of the aging process and respectfully submits that if it isn't written in stone, then it's easier to erase.

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***Commentary:***

I have had the pleasure of knowing Dr. Berman for several years and was introduced to his concept and theories of aging perhaps as long as six or seven years ago. Dr. Berman was a keynote speaker at the Academy's Body Contouring Meeting held in Atlanta last October, and this paper is in essence a condensation of his excellent presentation at that meeting.

Dr. Berman has put a great deal of time and effort into this presentation and he is to be complemented on his diligence by taking the photographs and imaging them into his computer and it is a shame that the photos reproduced only represent a small number of those presented during his presentation in Atlanta. Dr. Berman was perhaps one of the early surgeons in our specialty to promote the concept of fat injection into the face as a method of reversing some of the signs of facial aging. I find it quite interesting that now this is an extremely popular concept with quite expensive tuition to various courses and quite expensive instrumentation being promoted by various vendors. Dr. Berman's presentation is honest in his assessment of the limitations to fat enhancement injections to the face and his honesty and candor are refreshing. His references are extensively researched and it is obvious that he has put a great deal of time and effort into not only preparation of his original presentation but this paper.

Dr. Berman has always been an innovative thinker and this concept is a valuable addition as cosmetic surgeons continue in their attempt to address the problem of the aging face.

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***Response:***

I am humbled and flattered by the comments from Dr. Crockett whom I admire and respect for his work in cosmetic surgery. There are few greater gifts than the generosity of appreciation from your peers and superiors.

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