

Nonsurgical Facial Rejuvenation Procedures in Patients Under 50 Prior to Undergoing Facelift: Habits, Costs, and Results

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Abstract

Background: Facial rejuvenation in patients younger than 50 years of age has experienced an unprecedented growth with multimodality nonsurgical and less invasive rhytidectomy techniques.

Objectives: To analyze the nonsurgical treatment habits of patients prior to undergoing rhytidectomy at <50 years of age.

Methods: Retrospective study to enlist patients who underwent primary rhytidectomy at age <50 years between January 1, 2003 and December 31, 2013 by the senior author (AAJ) to complete a survey.

Results: One hundred and fifty-seven patients were surveyed. Patients had nonsurgical rejuvenation starting at an average age of 37 years and rhytidectomy at an average age of 44 years. Thirty-two percent of responders had injectable treatments prior to their facelift, reporting a mean of 7 rounds of injectable treatments prior to pursuing rhytidectomy. Sixteen percent of responders had laser skin resurfacing undergoing 4 separate treatments prior to rhytidectomy, and 10% had energy-based facial tightening treatments one time prior to their rhytidectomy. Average expenditure on nonsurgical treatments prior to rhytidectomy was \$7000 cumulatively. Fifty-nine percent of patients who went on to rhytidectomy did not report regret over this cost expenditure. Patients reported that they appeared 4 years younger after nonsurgical intervention, and 8 years younger after their facelift, a statistically significant difference ($P = 0.048$).

Conclusions: Patients undergoing rhytidectomy <50 years old begin less invasive facial rejuvenation treatments at an even earlier age. The majority of these patients did not regret the costs associated with noninvasive treatments, even though they saw that rhytidectomy provided a greater rejuvenation effect. Rhytidectomy surgeons should incorporate nonsurgical techniques into their practice to best serve the needs of the modern aging face patient.

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The field of facial rejuvenation has experienced an unprecedented growth with the expanding market of nonsurgical and minimally invasive techniques now available, such as neurotoxins, soft tissue fillers, lasers, and energy-based soft tissue tightening devices (ie, radiofrequency and microfocused ultrasound). As these less invasive options gain notoriety and trust from the public, consumption continues to grow. Since the year 1997 the use of injectables (including Botulinum Toxin A and soft tissue fillers) has grown by 6448%, and laser skin resurfacing by 111%.¹ This growth strongly suggests that less invasive options have a much broader catchment amongst the population, possibly attracting patients of a younger age range than more traditional surgical options.

The management of facial rejuvenation has evolved substantially since its inception. Surgery, however, has remained the standard of care for long lasting treatment of the aging face. Despite the growing market of less invasive

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techniques, rhytidectomy has maintained a stronghold in facial rejuvenation as the number of facelifts performed annually has increased by 28% over the past 18 years as nonsurgical options continue to grow at an exponential rate.¹ In fact, rhytidectomy currently ranks as the seventh most common cosmetic surgery performed in the United States, with 127,297 facelifts performed annually.¹

Younger women specifically are increasingly seeking intervention for the treatment of facial aging.² Despite this finding, national surveys have shown a trend of younger patients comprising a smaller proportion of all patients undergoing rhytidectomy in recent years. In 2015, patients < 50 years of age comprise 14% of the patients undergoing rhytidectomy, whereas statistics from 2000 show this age group represented 32% of the facelifts performed annually when many modern day nonsurgical options were not available.³

Minimally invasive methods of facial rejuvenation have proven to be effective, and also have won the trust of the public. The field of injectables and lasers will continue to expand as novel techniques and applications emerge. It is of paramount importance to appreciate the role of these techniques in comprehensively treating the aging face, particularly with respect to how these methods interplay with surgical standards of treatment.

This study analyses the characteristics of patients undergoing rhytidectomy under age 50, including their motivation for facial rejuvenation, their utilization of nonsurgical modalities prior to surgery, the types and frequency of nonsurgical treatments they underwent prior to surgery with economic considerations, and their satisfaction/perceived outcomes with their noninvasive and surgical treatments.

METHODS

This study was conducted in accordance with guidelines set forth in the Declaration of Helsinki. Patients who underwent primary rhytidectomy at age less than or equal to 50 years old between January 1, 2003 and December 31, 2013 by the senior author (AAJ) were reviewed. Inclusion criteria for the study was all patients that were new to the practice and were < 50 years of age who were presenting for rhytidectomy consultation at initial encounter. Any patients who were > 50 years old on presentation, had been previously treated by the senior author, or who presented for initial consultation for any reason other than rhytidectomy, were excluded from the study. Established patients of the practice that had been treated nonsurgically by the senior author prior to subsequently undergoing rhytidectomy at age < 50 years were excluded from this study. Patients who had undergone prior nonsurgical rejuvenation procedures were treated outside of our prac-

tice by a variety of multidisciplinary practitioners in the community with access to all techniques available on the market at that time. One hundred and fifty-seven patients were identified and were sent a survey by email. The survey contained 24 questions that permitted selection of a single answer, multiple answers, or a free text response, depending on the question presented (Appendix A, available as Supplementary Material). The survey responses were anonymous. The survey was sent in January 2014 and closed on March 31, 2014. Patients who were unresponsive received one reminder email prior to the close of the survey. The survey was developed by the senior author and has not been validated. At the time that this data collection was performed there were no validated questionnaires available. While the senior author currently uses the FACE-Q, a validated survey to assess patient satisfaction with outcomes after facial surgery, this survey was not developed until 2010 and validated in 2015.⁴ The data was analyzed anonymously and independently using the Survey Monkey (Palo Alto, CA) website and data analyzer.

RESULTS

Out of the 157 surveys that were dispersed 82 survey responses were received, yielding a response rate of 52%. There were no men included in this study. The mean age was 44 years (range, 39-50 years). The mean follow-up time was 12 months (range, 9-24 months). Of the 157 patients who underwent rhytidectomy below the age of 50 years, 8% of patients had a SMAS imbrication rhytidectomy, 37% had an extended SMAS flap rhytidectomy, and 55% had an extended deep plane rhytidectomy, which extends the deep plane dissection (originally described by Sam Hamra⁵), into the neck. As previously described by the author.⁶⁻⁸ The choice of treatment depended both on the degree of facial soft tissue ptosis and the change in the preferred surgical technique over the course of the 10 years that this study was conducted. The average chronological age at time of surgery was 44 years. Forty-four years of age was also the average perceived age that responders believed that they appeared prior to undergoing surgery.

An overwhelming number of respondents, 94%, cited prevention of aged appearance as their original reason for seeking rhytidectomy. Other reasons cited for seeking treatment include: career advancement (12%), inconvenience of multiple prior nonsurgical treatments (10.4%), significant other (8%), and perceived appearance via social media (3%) (Figure 1). Of the responders that cited social media as their original reason for seeking treatment, 100% named Facebook (Menlo Park, CA) as the social media application influencing their choice.

Injectable treatments, including neurotoxins as well as soft tissue fillers, were very popular among the nonsurgical interventions. Thirty-two percent (26/82) of responders reported undergoing injectable treatments at some point prior to their facelift, reporting a mean of 7 rounds of injectable treatments prior to pursuing rhytidectomy. Patients started injectable treatments at 38 years of age, and reported their perceived age to be 5 years younger after injectable treatments. Mean recovery time required after injections was 3 days for bruising and swelling. Botulinum toxin type A was the most commonly used injectable, with 84% of responders having utilized it. Of the soft tissue fillers, Restylane (Galderma. Lausanne, Switzerland) had been used by 40% of responders and Juvederm (Allergan. Dublin, Ireland) by 24%. The least commonly utilized fillers were Perlane (Galderma. Lausanne, Switzerland), Radiesse (Merz Aesthetics. Raleigh, NC), and Sculptra (Galderma. Lausanne, Switzerland), with a reported 4% usage each (Figure 2).

The use of laser treatments was also surveyed. Sixteen percent (13/82) of responders indicated that they had undergone laser treatments prior to their rhytidectomy. On average, patients underwent their first laser treatment at 37 years of age, and had undergone 4 separate treatments

prior to their rhytidectomy. Recovery time from each treatment was reported to be mean 11 days. This reflects the patients' subjective reporting based on the treatments available at the time of the study, which may not reflect newer technologies. Patients reported appearing 4 years younger after their laser treatment. The most commonly used laser was Fraxel (Valeant Pharmaceuticals. Laval, Canada) (fractional non-ablative), which was used by 6 survey responders. Of the remaining, 4 patients had fractional CO2 laser resurfacing and 3 had "other" laser treatments (eg, intense pulsed light) (Figure 3).

Only 10% (8/82) of responders had used energy-based facial soft tissue tightening devices, and had undergone 1 treatment prior to their facelift. Four had Titan (Cutera, Brisbane, CA) (radiofrequency), 2 underwent Ulthera (Merz Aesthetics. Raleigh, NC), (microfocused ultrasound), and 2 had Thermage (Valeant Pharmaceuticals. Laval, Canada) (radiofrequency) (Figure 4).

Ten percent of responders indicated that the inconvenience of multiple prior nonsurgical procedures was one of their primary motivations for pursuing rhytidectomy. In fact, patients reported that they had spent on average \$7000 undergoing nonsurgical treatments prior to their facelift. Whereas 41% of our responders indicated

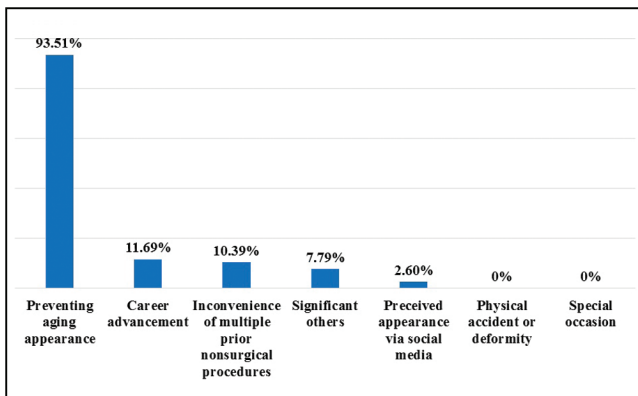


Figure 1. Reasons cited for undergoing rhytidectomy.

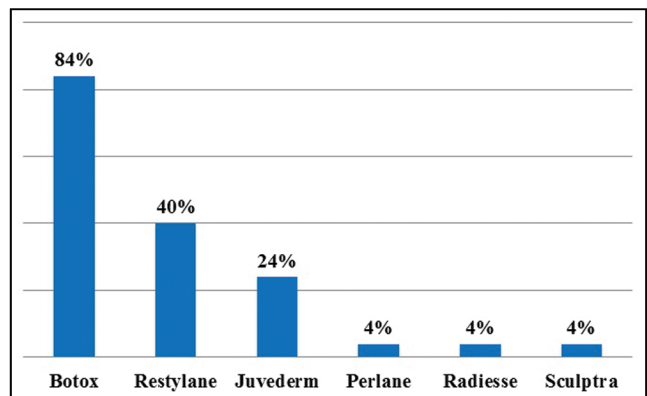


Figure 2. Injectable treatments prior to rhytidectomy.

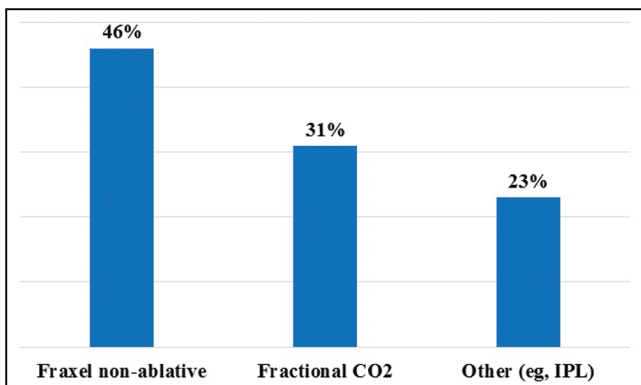


Figure 3. Laser treatments prior to rhytidectomy.

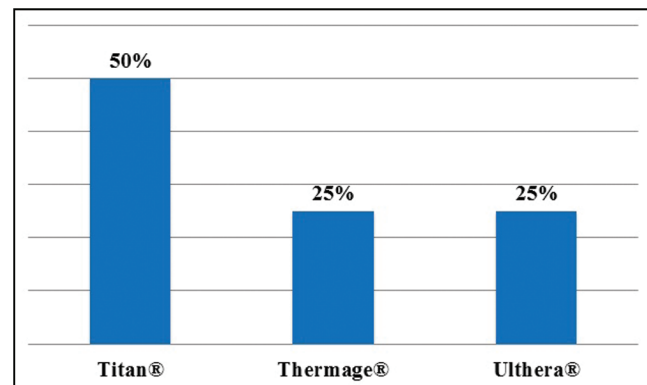


Figure 4. Energy-based soft tissue tightening prior to rhytidectomy.

that they wish they could have put the money that they spent on nonsurgical treatments towards their facelift, the remaining majority (59%) reported that if able to do it again they still would have spent the same amount of money on nonsurgical treatments for rejuvenation prior to undergoing their facelift.

Patients were also queried regarding their surgical outcome. Patients reported that they appeared 8 years younger after their facelift (Figure 5). The majority of patients (91%) indicated that they were satisfied to very satisfied with their surgical result. When patients were asked if they would have sought a surgical procedure sooner if they had known the outcome, the response was split almost equally. Fifty-two percent (52%) of responders indicated that they would have escalated to surgical intervention earlier, whereas the remaining 48% reported that they still would not have elected to undergo rhytidectomy at a younger age.

ANOVA statistical analysis was used to compare the perceived age difference that patients reported after injectable, laser, and facelift treatments. Patients reported appearing 4 years younger after laser treatments, 5 years younger after injectable treatments, and 8 years younger after a facelift. Patients appeared significantly younger after facelift surgery as compared to injectable and laser treatments ($P = 0.048$).

DISCUSSION

This study's findings show that patients perceive approximately a 4 to 5 year reduction in apparent age after undergoing a variety of nonsurgical therapies. Injectables and lasers were initiated at approximately the same age, at 37 to 38 years of age. Twice as many responders were utilizing injectables pre-rhytidectomy than were using lasers. This may be related to the shorter downtime post-treatment associated with injectables, or may just represent a broader market share and public acceptance of injectable treatments. Both injectables and lasers were used serially,

with recurrent access to treatments prior to rhytidectomy. Injectables were used an average of seven times prior to rhytidectomy, whereas laser treatments were repeated four times prior to surgery (almost half as many uses as injectables). Given that the 7-year span of time between initiation of nonsurgical treatments (mean, 37 years of age) and rhytidectomy (mean, 44 years of age) is similar for both lasers and injectables, the almost doubled number of injectable treatments likely reflects that the results of injectable treatments last shorter than those of laser treatments.

Only 32% of our patient cohort reported undergoing injectable treatments prior to rhytidectomy. This number is likely deceptively low by today's standards given the fact that a majority of this data was collected prior to the rapid growth of the injectable and laser/skin tightening device market after 2010. Our study collected data on patients undergoing rhytidectomy between 2003 and 2013. Given the exponential growth of the noninvasive treatments during this decade, the particular treatments that they had access to varied greatly. The noninvasive treatments that are reported on in this study do not represent a preference necessarily, moreover just a recounting of what treatments had been accessed at that time in this subspecialized cohort of patients. It would be valuable to repeat this study on a larger scale in the 10 years that follow this study cohort (from 2013 to 2023), to see how patient perception changes and to reassess the nonsurgical rejuvenation market in the context of continually improving technology and techniques.

Patients reported spending an average of \$7000 cumulatively on nonsurgical treatments prior to rhytidectomy, a substantial investment considering the impermanence of the results and the inevitable cost of subsequent surgical intervention. Interestingly, 59% of patients who went on to rhytidectomy did not report regret over this cost expenditure, or the desire to take back the time spent on therapies pre-rhytidectomy. Because patients had treatments by a variety of providers prior to presentation it is difficult to extract the expenditure per treatment. On average, patients underwent 7 rounds of injectables and 4 rounds of laser treatments prior to surgery. With an average cumulative expenditure on these treatments reported as \$7000, the average per treatment engagement cost was approximately \$636. This statistic should help the surgeon understand that delivery of noninvasive facial rejuvenation treatments is an important part of servicing the patient < 50 years that will ultimately undergo rhytidectomy. Patients < 50 years seeking rhytidectomy appear committed to maintenance of youthful appearance from an early age, starting with nonsurgical treatments at an average age of 37 and escalating to definitive surgical correction at an average age of 44. This is substantiated by the finding that 94% of this cohort cites prevention of aged appearance as their original motivation for seeking treatment.

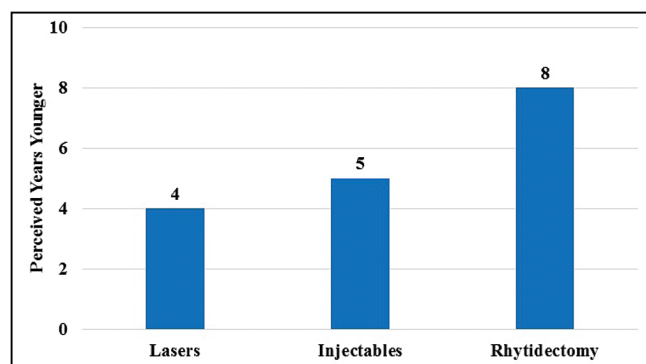


Figure 5. Perceived years younger per treatment.

We must acknowledge that because the patients in the cohort had a rhytidectomy prior to age 50, the percentage of them engaging nonsurgical treatments may be skewed low. Patients who engage surgery at an earlier age may have a different philosophy, seeking a long term fix vs multiple, recurrent treatments that last a short period of time.

Rhytidectomy remains the standard for long lasting facial rejuvenation.⁹ Some studies have documented rhytidectomy longevity as being 12 years, on average.⁹ The findings in this study reinforce our fundamental belief that surgical treatments yield greater effects, and longer lasting rejuvenation than less invasive treatments. This study finds that patients perceive themselves to appear 8 years younger after rhytidectomy, whereas noninvasive treatments garnered only half of that result. There have been disparate findings in the literature regarding perceived age decrements after facial rejuvenation surgery. One study, which looked at patients after any aesthetic facial surgery procedure, showed that subjects were perceived to appear just 3 years younger postoperatively.¹⁰ Other data, which classified patients according to which surgical treatments they had received, showed a 6 year perceived age decrease after face and neck lift, 7.5 year perceived age decrease when blepharoplasty was added, and an 8 year decline in perceived age when face and neck lift, blepharoplasty, and forehead lift was performed.¹¹

Interestingly, younger patients undergoing rhytidectomy have been shown to report higher satisfaction rates and also to garner better long term rejuvenation effects than more elderly patients undergoing the same surgery.¹² This suggests that the younger patients, who may be the population most likely to defer surgical intervention for the heavily marketed less invasive “touch ups,” is the cohort that derives maximal benefit from a “maintenance facelift.”⁴ This highlights the importance for newer techniques of injectables and lasers to complement surgical rejuvenation, rather than to be perceived as a tactic to postpone or replace surgery entirely.

In this study, the average age at initiation of nonsurgical treatment was 37 years and the average age of patients undergoing rhytidectomy was 44 years. We hypothesize that the 7-year gap between those patients initiating nonsurgical treatments and those undergoing rhytidectomy likely reflects that nonsurgical treatments are less efficacious in treating more significant facial aging changes. The earliest signs of facial aging are being addressed with less invasive options such as injections and laser treatments. As the more substantial stigmata of aged appearance set in over the course of 7 years, patients are seeking surgery despite their continued use of less invasive techniques. This suggests that the effects garnered from less invasive options are no longer perceived as adequate in more advanced age. We believe that this may speak to the requisite progression of nonsurgical to surgical treatments for facial rejuvenation. As the cumulative cost of less invasive

options continues to accrue despite less efficacious results, patients perceive surgery as a better option.

There are many reasons why patients may choose to engage nonsurgical treatments instead of surgery. These reasons and their relative importance are a unique variable to each patient, and include financial cost, risks associated with surgery, or because of the desire to decrease the amount of downtime they might have to endure if they have surgical facial rejuvenation. The average amount of time for recovery after aesthetic injectables (bruising and swelling) was 3 days, and on average each patient had 7 sessions of injection prior to decide to have rhytidectomy surgery, for a total of 21 days of recovery per patient. This cumulative 21 days of recovery is equivalent to, or likely longer than, the recovery after rhytidectomy surgery. Our patients usually will return to work 10 to 14 days after surgery. The amount of recovery is longer in one stretch of time after surgery, but overall is less time when compared over the duration of engaging in injectable nonsurgical techniques. The average recovery time after laser resurfacing was 11 days, which is similar to recovery after surgery. The case for nonsurgical treatments being “no downtime” or “lunchtime,” like so often marketed, therefore is probably overstated.

An issue particularly salient to this younger subset of patients is the continually escalating influence of social media in awareness and self-appraisal of one's physical appearance. In a recent survey, 33% of surgeons reported an increase in requests for plastic surgery due to patients' increased self-awareness of appearance from social media.¹³ This finding is not surprising given the increase in availability, abundance and accessibility of images of oneself available for public consumption via social media, even if not initiated by the individual themselves. In this study, only three percent of our patients cited social media as their primary impetus for seeking surgical rejuvenation. All of these patients who responded that their perceived appearance on social media was their primary motivation to seek a facelift cited Facebook as the specific social media app that was the impetus. We believe the number was small because a significant percent of the cohort was treated prior to 2010 when use of social media grew exponentially. As social media continues to have a more influential role in our interpersonal interactions, this phenomenon of increasing self-awareness will likely grow accordingly, as has been shown in recent national surveys.¹³

One limitation of our study was the restriction of the included nonsurgical techniques to injectables, lasers, and skin tightening treatments. There are many other noninvasive rejuvenating treatments that are easily accessible and widely used, including chemical peels and micro-dermabrasion. More information about how utilizing these treatments ultimately affect decision making about more invasive nonsurgical treatments and aging face surgery may be helpful. That being said, it is the senior author's

experience that these less rejuvenating treatments are used in patients as young as their 20s and 30s and often precede injectable and laser treatments.

This study explores the habits of a specific young cohort of patients undergoing rhytidectomy prior to 50 years of age. This study identified that these patients engage in nonsurgical treatments even earlier for a substantial amount of time prior to deciding to undergo surgery, and at a significant financial expenditure. Furthermore, the majority of the patients reported that if they could do this again they would still spend that amount of money on nonsurgical treatments for rejuvenation prior to undergoing facelift. This data makes us aware that the specific cohort investigated in this study is one that is highly vigilant and intolerant of aging. These findings support that while there is certainly a very important role in maintaining patients with noninvasive treatments, for the properly selected patient there is a role to convert to rhytidectomy prior to 50 years of age. More than half of the patients in this study stated that they wish they had escalated to surgical intervention earlier once they knew the outcome of surgical intervention. While noninvasive treatments have been touted to have less downtime, we found that this should be considered in a broader context. The cumulative downtime of undergoing 7 rounds of minimally invasive treatments is not inconsequential and may equal, or in some cases exceed, the downtime associated with rhytidectomy. We hope that disseminating this information may help plastic surgeons in practice minister to this unique subset of young patients that has continued to grow.

CONCLUSION

In conclusion, nonsurgical and surgical interventions alike are important to consider in facial rejuvenation. Addressing the needs of prevention and reversal of aging is unique to each particular patient population, and should be considered accordingly. Nonsurgical interventions should not delay or dispel the role of surgery in this younger subset of patients who may benefit the most; rather there is a valuable role for utilizing less invasive treatments prior to rhytidectomy. The mastery of minimally invasive techniques is part of a well-rounded plastic surgery practice, and certainly is an important aspect of servicing the needs of patients prior to rhytidectomy. This is providing comprehensive facial rejuvenation care to the best of our ability in the modern era.

Supplementary Material

This article contains supplementary material located online at www.aestheticsurgeryjournal.com.

Disclosures

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