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FACIAL PLASTICS: FACIAL SKIN REJUVENATION (PJ CARNIOL AND AE BRISSETT, SECTION EDITORS)

Facial Rejuvenation in Patients of Color

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Abstract

Purpose of Review The purpose of this review is to illustrate different factors and considerations in providing facial rejuvenation procedures to non-Caucasian patients. As providers, we must understand how the aging process differs for patients of color and anticipate its effects on various interventions.

Recent Findings Elements of beauty and ideal facial measurements may differ from classically described archetypes based on a patient's ethnic and cultural background. Non-Caucasian patients tend to benefit from treatments that target skin resurfacing and volume loss. The use of widely available techniques such as lasers, intense pulsed light (IPL), and chemical peels can have significant side effects if it is not chosen carefully based on a patient's skin type.

Summary A patient's genetic and ethnic background manifests in differences in the aging process. One must consider cultural norms, patient expectations, and susceptibility of unwanted side effects when selecting a tailored and individualized plan.

Keywords Aging face · Ethnic · Facial rejuvenation

Introduction

Across ethnicities, geographical regions, and cultural groups, facial aging is marked by predictable changes in each decade. In the third decade, collagen breakdown begins, setting the stage for aging changes in subsequent decades. In the fourth decade, early facial lines and wrinkles become visible—a result of damaged collagen and accumulated skin injury from oxidative stress. In the fifth decade, fine lines and wrinkles become more prominent, skin begins to lose moisture and elasticity, and the face can appear dull. Accumulated sun damage begins to manifest as sunspots and hyperpigmentation. In the sixth and seventh decades, hormonal changes thin the facial skeleton and fat compartments. Deflation of deep facial fat compartments, coupled with loss of bony support, leads to volume shifts that result in malar droop, deep melolabial folds, and jowling. Lines around the eyes and sun-exposed areas, as well as dryness, dullness, and changes in skin texture and tone, become more evident. In females, the onset of menopause accelerates the rate of collagen and elastin breakdown, resulting in deeper facial lines. The amount of superficial oil production is also reduced during these decades, leaving the skin dry and dull. Overall, the face changes shape and becomes increasingly bottom heavy.

While facial aging is influenced by lifestyle choices, genetics and skin type can also play a dominant role. Factors that influence how the skin ages can be categorized as intrinsic or extrinsic [1]. Intrinsic factors include genetic constellation contributing to loss of elasticity, volume, and skeletal support. Extrinsic factors include diet and nutrition, trauma, and exposure to UV radiation and toxins. Structural and reactive differences in melanocytes, fibroblast reactivity, and collagen thickness in lighter vs. darker skin types underlie the differential manifestation of photoaging [2, 3].

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These differences are key in how the facial skin responds to various facial rejuvenation procedures.

Global migration and the increasing diversity of patients seeking facial rejuvenation have added a layer of complexity to the practice. It is now common for the ethnicity of the patient seeking facial rejuvenation to be different than that of the surgeon or provider. Furthermore, patients of mixed races and ethnicities may not fit the expectations of any group of people [4]. Consequently, a foundational understanding of the characteristic patterns of facial aging and the typical responses of various skin types to common interventions is necessary when treating the aging face.

A targeted approach to facial rejuvenation can be structured based on a generalized understanding of facial aging and what motivates patients of various ethnic groups. In a study using photometric rating scales depicting degrees of severity for 10 facial aging characteristics among Blacks, Hispanic, Asian, and Caucasian women aged 18 to 75 years, Black women reported the least severe facial aging, and Caucasian women reported the most severe facial aging [5••]. Similarly, women with a skin phototype V/VI reported lesser aging severity than women with phototypes I through IV. More than 30% of black women did not report the presence of moderate/severe aging of facial areas until 60 to 79 years. Most Hispanic and Asian women did not report moderate/severe facial aging until 50 to 69 years, whereas Caucasians reported aging at 40 to 59 years.

In this review, we discuss facial rejuvenation in patients with Fitzpatrick skin type IV–VI based on the typical aging process, challenges with rejuvenation, and problem-based solutions.

Patients of Asian Descent

Most Asians have relatively darker skin, usually type IV and above. However, lower Fitzpatrick types are also seen among certain subgroups. For example, Northern Chinese and Japanese patients usually have lighter skin types (II–III), Malaysians and Filipinos have medium skin types (III–IV), while other countries such as India have a wide range of phototypes from very light to very dark. Asian skin is reported to have a thicker dermis, which contains more collagen with high levels of pigment in the epidermis. The high pigment content preserves Asian skin against early photoaging with fewer fine line and wrinkles in the 3rd and 4th decades.

In a study of 403 Asian participants aged 30 to 65 years, the predominant facial aesthetic concerns were uneven skin tone, wrinkles, and sun damage. The most bothersome facial areas included the periorbital area, forehead, and submental area. Most participants considered injectables as a solution to their aging changes. Primary barriers to care included safety/side effects, cost, and concerns about not looking natural [6].

In another survey of experts who treat Asian patients, skin treatments with lasers/IPL/botulinum toxin were the most common rejuvenation interventions among Asian women younger than 40 years. Hyaluronic acid fillers became a higher priority for patients older than 55 years [7]. Pigmented spots of the cheeks and foreheads are common signs of aging among these patients [8]. Carefully selected lasers, IPL, and chemical peels can smooth the appearance of melasma and hyperpigmentation (Table 1).

Acne and associated post-inflammatory changes are common causes of uneven skin tone among Asians. Treatment of acne-related hyperpigmentation is a common reason for seeking early facial rejuvenation interventions. Clinical guidelines and expert recommendations emphasize the central role of topical retinoids in acne management. Topical retinoids target comedones, the precursor to all acne lesions, as well as clinically visible acne lesions. Retinoids are also effective against acne-associated inflammation. When prescribing topical retinoids, it is prudent to start with a low concentration and select a tolerable formulation. Starting therapy with alternate day dosing for the first 2 weeks can help reduce the risk of irritation and post-inflammatory

Table 1 Facial rejuvenation options for signs of aging by ethnic group

Ethnic subgroup	Pigmentary changes	Dynamic wrinkles	Dark eyelid circles	Deep nasolabial folds	Jowl blunted neck line
Asian	4th decade Lasers IPL Chemical peels	4th decade Botulinum toxin	-	5th decade Fillers	5th decade Botulinum toxin HA fillers
Mestizo/Latino	-	4th decade IPL RF Chemical peels	3rd decade HA fillers	5th decade Fillers	5th decade
African descent	5th decade IPL Chemical peels	8th decade Botulinum toxin	4th decade Filler Blepharoplasty Nanofat grafting	5th decade Fillers/implants Fat augmentation	-

hyperpigmentation. The addition of antimicrobials to retinoids is also helpful for longer lasting control.

A major feature that influences facial aging among Asians is the characteristic facial structure. Asian and Latino patients are particularly deficient in the midface and chin [9]. The under-projected facial structure among Asians results in early volume depletion and general tissue descent due to less skeletal support. As patients age, these changes can accentuate intrinsic skeletal deficiency such as the medial malar region, inferior orbital rim, jawline, and chin [7]. Although apparent, photoaging in the form of fine lines and deep rhytids are not as prominent as those in Caucasian patients [10]. When evaluating these patients for facelifts and facial rejuvenation, it is important to take into account the potential gain in augmenting volume in these areas. In an Asian female patient, midfacial rejuvenation with dermal filler should be placed in the medial maxilla for central midface projection. This is in contrast to a Caucasian female patient who would benefit from dermal filler in the lateral maxilla and zygoma region [11]. The aging nose can often reveal underlying lack of dorsal height, poor tip support, and wide alar base. These changes can be addressed with injectables as well as surgery.

Signs of aging in the lower face among patients of Asian descent include hyperactive mentalis accentuated by retrogenia or microgenia, perioral rhytids, and platysmal banding. While treating the masseter muscle to slim facial width is common among Asian patients younger than 30, it is less of a priority for older patients as this could worsen the appearance of jowling [7, 12]. Treating the chin is done with a combination of botulinum toxins and fillers in order to relax the mentalis muscle while augmenting a hypoplastic chin. Furthermore, the "golden ratio" of upper to lower lips do not typically apply to Asian women. When electing for filler augmentation of the lips, the goal is generally to refine shape and balance rather than augmenting size.

Most Asian patients prefer a smooth upper face with the ability to demonstrate expressions. Therefore, a lower dose of botulinum toxin with a shorter duration should be used [7]. Temporal hollowing among older patients can be addressed with HA fillers. Younger Asian female patients may seek to decrease facial width and increase facial height. Older Asian female patients will address similar deficits in facial morphology while also replacing volume loss associated with aging [11].

Patients of South Asian and Middle Eastern Descent

The aging process associated with patients of South Asian and Middle Eastern descent is unique and affects the timing and opportunities for facial rejuvenation. Although photoaging is less prominent due to their darker skin tone, anatomic and structural changes can cause other earlier signs of aging. Ethnic origins of patients of Middle Eastern descent stem from northern Europe, western Africa, and South Asia [13]. Therefore, it is important to take each patient's individual facial anatomy and skin into consideration when analyzing the effects of aging. In one study of women in India, the appearance of forehead rhytids and crow's feet occurred between 35 and 40 years of age [14]. The appearance of brow ptosis can also begin as early as 35–40 years, with signs of dermatochalasis occurring in the following decade of life. Tear trough deformity is particularly common in patients of this ethnic group, occurring as early as 20–30 years of age. In the midface, patients with Fitzpatrick V skin show deeper nasolabial fold formation as compared to patients of other skin types [14]. More pronounced cheekbones with fuller buccal fat pads among South Asians lead to a rounder contour [15]. In the lower face, signs of aging first begin with laxity of neck soft tissue and increase in neck volume. Among women of Middle Eastern descent, aging causes midface sagging that leads to jowling and heaviness in the lower third of the face [13].

While photoaging may not be a main concern, one must understand the effects of light, energy, and chemical-based resurfacing in patients with darker skin tone. Various lasers can be used for skin resurfacing and other dermatologic considerations. Lasers target a specific chromophore such as hemoglobin, melanin, or water. Traditional ablative lasers such as CO_2 or Er:YAG lasers tend to cause more dyspigmentation in patients with darker skin. Patients with darker skin tone have more melanin, which can incidentally absorb more laser energy as a competing chromophore. Absorption tends to be greater with shorter wavelengths. Post-inflammatory hyperpigmentation (PIH) is the most common adverse effect among patients with darker skin [16]. PIH is associated with damage to the papillary dermis and is associated with higher quantity of melanin. One retrospective review of laser resurfacing 1550-nm erbium-doped laser showed an incidence of PIH of up to 33% among Fitzpatrick V patients [17]. In addition to PIH, damage to melanocytes can cause hypopigmentation. Risk of hypopigmentation can be lowered by using more superficial or fractionated lasers [18].

There are many alternatives to traditional laser resurfacing for patients with darker skin. Pre- and post-treatment bleaching agents and retinoids can be used to prevent dyspigmentation [19]. Lasers with a safer profile for these patients include those with longer wavelengths such as the 810 and 1064 nm Nd:YAG, intense pulsed light and monochromatic excimer light (208 nm) and fractional lasers [2]. Non-ablative lasers target the dermis and tend to spare the epidermis. However, even non-ablative fractional lasers have demonstrated up to 40% PIH among patients with darker skin [20].

Non-laser energy–based resurfacing options include intense pulsed light (IPL) and radiofrequency (RF). IPL uses flashlamps to generate light pulses of various duration, intensity, and wavelengths as defined by specific filters. The settings can be adjusted to reduce light absorption by melanin and decrease thermal damage [21]. Radiofrequency uses electromagnetic radiation emitted through microneedles to create kinetic energy that then converts to thermal energy. The heat that is created promotes collagen formation and dermal remodeling [22]. These alternatives are associated with less downtime but also less dramatic results (Table 1).

Chemical peels are another commonly used exfoliating procedures for skin resurfacing. Various ingredients are used to control the depth of treatment. Superficial peels affect only the basal layers, medium peels penetrate to the papillary dermis, and deep peels treat at the level of the reticular dermis. Generally, deeper peels are associated with more downtime but also more dramatic results. Among superficial peels, salicylic acid is considered safest for darker skin such as Fitzpatrick V and VI [23]. In a large retrospective review of patients with Fitzpatrick III–VI skin, 3.8% presented with adverse effects after chemical peels [24]. The most common adverse effects were crusting, PIH and erythema. None exacerbated any patient's skin as compared to pre-treatment. These adverse effects were most common in patients with skin type VI. Other studies, however, have found much higher rates of adverse effects among patients with darker skin types with rates of erythema as high as 25% and PIH over 15% [25, 26].

Patients of African Descent

Patients of African descent have different features and expectations of beauty based on ethnic and cultural standards. Photoaging is not a typical feature of women of African descent, but there are other early signs of aging that manifest in predictable patterns. As they age, patients of African descent do not experience as much rhytid formation but rather skin sagging and folds. Women in their 40s demonstrate deepening of their nasolabial folds and pronounced oral commissures. Other signs of aging such as midface volume loss and crow's feet wrinkle typically appear when women are in their 70s. Characteristic facial skeletal changes influence how Black patients age. One study on the changes in the facial skeleton over the course of 6 years identified a significant increase in the mean piriform aperture width and female orbital width as well as a decrease in mean frontozygomatic junction width [27]. There are few signs of aging in the upper face and brow. However, signs of aging in the eyelids include soft tissue fullness and infraorbital shadowing due to proptosis [28]. In the midface, malar hypoplasia contributes to soft tissue descent. Jowling in these patients are a result of thick skin and soft tissue rather than increased laxity. In the neck, excessive submental fat and thick skin contribute to widening of the cervicomental angle [28, 5••].

Poor scarring and hyperpigmentation are a major concern in any rejuvenation procedure prescribed for patients of African descent. These concerns, while not precluding invasive procedures, should inform the rejuvenation approach on this patient group. According to one study, uneven skin tone/color (57%) and dark circles under the eyes (48%) were the most frequently reported facial concerns [29]. Other regions of the face that concern patients include the chin and submental area, periorbital area, and forehead lines. As patients age, their areas of concern shift to include the midface and lower face. Although the majority of participants would consider injectables, the cost and safety/side effects were cited as frequent concerns [29].

Volume restoring procedures should be considered for facial rejuvenation when the primary issues are malar descent and deeper nasolabial folds. Autologous fat augmentation can be very effective in correcting malar descent and effacing deep nasolabial folds. The approach with fat augmentation is to reinflate deflated compartments (Table 1).

Midfacial augmentation can also be achieved with malar and submalar implants. Soft tissue augmentation fillers that stimulate collagen production such as calcium hydroxylapatite (CaHa) and poly-L-lactic acid (PLLA) are more effective and can often lead to a longer lasting effect due to their tissue response to treatment [30]. Hyaluronic acid is preferred for lip augmentation. Black women tend to form rhytids in the body of their lips due to volume loss with aging. As a result, the goals for filler injection is to restore volume and recreate the lips of their youth [30]. Botulinum toxin-A can be used safely to treat static and dynamic rhytids. Patients of African descent are more prone to PIH as well as keloid formation, which are both possible side effects of injectables. Threading injection techniques should be used, and multiple punctures should be avoided.

Periorbital rejuvenation is another common reason patients of African descent seek intervention. Aging changes and treatment options for the periorbital complex is typical across all ethnicities. In African patients, dark circles under the lower eyelid can present in the early 30s. Filler injection for mild cases is a common first option with blepharoplasty reserved for more severe cases with pronounced pseudofat herniation or skin laxity. Fat grafting to the eyelid should be performed with fine and deep fat deposits to avoid palpable lumps. Nanofat grafting is ideal for this purpose (Table 1).

One key consideration when evaluating a patient for periorbital rejuvenation is the vector of the lower eyelid. Patients with a negative vector, where the globe is located anterior to the most anterior portion of the maxilla, are at risk for complications after traditional lower blepharoplasty. Patients

may be considered for aesthetic orbital decompression as a part of their periorbital rejuvenation.

Common themes of aesthetic rhinoplasty concerns for black females include more definition in the nasal dorsum and nasal tip, tip projection, and narrowed alar base [31, 32]. Anatomically, the obtuse angle made by the nasal bones to the dorsum creates an allusion of poorly projected dorsum [32]. However, carefully planned osteotomies can create a narrower and defined dorsum without overprojecting the nose. For women of African descent, the alar base width correlates better with the intercaruncular distance rather than the intercanthal distance, a metric used for Caucasian patients. In addition, the cupid's bow aligns with the tip defining points of the nose and the radix should be aligned with the mid-pupillary line or upper lash line [33••]. A common complaint is excessive alar flaring. This can be mitigated with alar rim grafts, enhanced projection, or resection of alar soft tissue [34]. When grafts are required, it is important to keep in mind that the quadrangular cartilage may not be sufficient in these patients. The soft tissue envelop around the tip tends to be thick and sebaceous, causing difficulty in establishing tip definition and projection. Preoperative skin treatment or careful debulking of the soft tissue may be required to illuminate tip definition.

Mestizo, Hispanic/Latino Patients

Mestizo patients are the largest and fastest growing cosmetic group. The Mestizo race is characterized by a mixture of races. Their skin type varies from Fitzpatrick II–VI and facial structures vary broadly as well. Thus, their care cannot be generalized based solely on a single ethnicity or race. While some facial structures are like anthropometric measurements in Caucasians, while others are more consistent with patients of African descent. Typically, these patients have increased melanin, which provides protection against photoaging. However, they also tend to develop skin mottling, jowling, infraorbital hollowing, and shadowing [28]. In the upper face, these patients tend to have eyebrow and eyelid drooping as well as lower lid fat herniation. In the midface, their soft tissue becomes thicker and heavier, causing prominent nasolabial folds. In a study on 401 participants aged 30 to 65 years, Hispanic/Latino study participants were mostly interested in correcting facial wrinkles, periorbital signs of aging, and uneven skin tone. Most bothersome facial areas included the submental area, periorbital area, and forehead, which were also among the areas most likely to be treated first [35].

Disorders of hyperpigmentation such as melasma, postinflammatory pigmentary alteration, and lentigines pose significant cosmetic concerns for women of Hispanic or Latino race and ethnicity. While hydroquinone-based products have been the mainstay of treatment, natural ingredients are gaining popularity as alternative, safe, and effective topical depigmenting agents. Natural ingredients that have demonstrated efficacy and safety as depigmenting agents include niacinamide, soy, azelaic acid, ascorbic acid, licorice, emblica, and belides [36].

Treatment of the periorbital complex in Hispanics/Latinos is like the approach in other ethnicities and tailored to correct fat herniation, dark circles, and skin redundancy. As in other ethnic subgroups, mild forms of lower eyelid circles can be treated with filler or fat augmentation. Severe cases are best addressed with fat compartment reduction with or without skin excision. Midfacial augmentation with fillers, fat, or implants is effective ways of improving volume deflation and deep nasolabial folds (Table 1).

The Latino or Mesorrhine nose has characteristics of many different races, making its classification and generalization difficult. Like patients of African descent, these patients may have thick sebaceous skin and small osteocartilaginous frameworks. The principles that guide ethnic sensitive rhinoplasty should guide nasal reshaping surgery in this ethnic group [31].

Facelift in Patients of Color

A search of the literature for facelift in Asians, African Americans, or Mestizos yields very little. There is either limited expertise among facelift surgeons or underrepresentation of experience in the literature. The concern for hypertrophic scarring or keloids in this patient subgroup is a major hurdle. While minimally invasive rejuvenation techniques are routinely used to address brow and midface descent, a facelift is indispensable when the primary goal is to correct jowls, platysma banding, and poorly defined neck. Once a decision to proceed with facelift is made, it is important to have a discussion with patients about the risk of scarring and plan to minimize and treat any undesirable scars that may result. Intraoperative steroid injection, early application of scar-reducing topical agents, and frequent follow up may be necessary.

Besides the concerns for unsatisfactory incisional scars, the technical aspects of performing facelifts in patients of color is not different from those in Caucasian patients. All efforts should be made to limit the extent of incision without compromising outcome. A vertical vector lift allows correction of jowls. Planning skin excision mostly in the preauricular area limits the extent and need for extending skin incisions to the post-auricular area. Adjunctive techniques such as submental liposuction and placement of chin implants can be effective in improving the neckline.

Conclusion

Facial rejuvenation is a popular demand in any aesthetic practice. Little is reported on best practices for patients with darker skin types such as Fitzpatrick IV–VI. As with all patients, there is a variety of surgical and non-surgical options for facial rejuvenation. Every procedure is affected by the composition, thickness, elasticity, and healing potential of the skin and soft tissue envelope. Therefore, it is important to predict how these will contribute to the patient's ultimate outcome. Most standards in facial plastic surgery were designed for an archetypal Caucasian face. When treating a non-Caucasian patient, a provider must consider the patient's anatomy, perceptions of beauty and expectations for improvement. Any intervention must be tailored to the individual patient and respect their cultural norms.

Compliance with Ethical Standards

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

Conflict of Interest The authors declare no competing interests.

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