Characterizing Fat in the Superficial and Intermediate Layers of the Neck: Analyzing Variations with Age using Volumetric Computed Tomography

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INTRODUCTION: Fat compartment distribution plays an important role in the aging process of the neck, yet the specifics of this process are largely unknown. This study utilizes volumetric computed tomography in live patients to characterize the fat compartments of the neck and examine how they change with respect to age.

MATERIALS AND METHODS: Neck CT angiography was obtained for 20 “young” (age 20–35 years old) and 20 “elderly” (age 65 – 89 years old) females. The volume of neck fat in the supa and subplatysmal planes were quantified. Distribution of fat volume was assessed by dividing each supra and sub platysmal compartments into upper, middle, and lower thirds.

RESULTS: Total supraplatysmal fat volume was significantly greater than subplatysmal volume within both the “young” and “elderly”; however, “young” had significantly more total supraplatysmal fat than “elderly” (p<0.0001). There was no significant difference in fat volume between each third of the neck in the supraplatysmal compartment in “young”. The middle third of the supra-platysmal fat volume in the “elderly” (28.58±20.01 cm³) was significantly greater than the upper (18.93±10.35 cm³) and lower thirds (15.46±11.55 cm³) respectively (p<0.01). There was no significant difference between the total sub-plantysmal fat volume between the young and the elderly groups (p>0.05).

CONCLUSION: We demonstrate that total supra-platysmal fat volume significantly decreases with age. In addition, the elderly have significantly more fat volume in upper and middle thirds of the supra-platysmal neck, whereas young females have more evenly distributed fat volume between the three regions of the neck. This seems to be consistent with the observation of the elderly experiencing fat volume loss and subsequent “deflation” of the skin, causing skin laxity and vertical bands of the neck.

A Prospective, Within-Subject Controlled Study of the Safety of Allograft Adipose Tissue Injections into the Hypodermis of Healthy Adults

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INTRODUCTION: Autologous fat transfer (AFT) has been used for years as a permanent filling option for soft tissue defects. There are several challenges related to AFT such as overfilling, unpredictable resorption, and donor site morbidity. An allograft adipose-derived filler with native growth factors bound to the extracellular matrix to encourage angiogenesis and adipogenesis can be used as an alternative to AFT. In this study we evaluated the safety of allograft adipose tissue injections into the hypodermis of healthy adults who are scheduled for elective body reduction surgery.

MATERIALS AND METHODS: An ongoing prospective, within-subject controlled study of the safety of allograft adipose tissue injections into the hypodermis was conducted. All subjects planned to undergo elective body reduction surgery to areas such as the arms, legs, or abdomen in ≥ 30 to ≤180 days and received allograft adipose injections into an area of hypodermis intended for surgical excision. Similar tissue from the subject’s contralateral side served as the control. The subjects rated pain on an 11-point scale and completed a 14-day safety diary beginning on the evening of treatment to report any injection site responses.

When the planned elective body reduction surgery was performed, the area treated with allograft adipose tissue injections was surgically excised and a biopsy of the treated area was sent for histopathology examination. Similar tissue on the contralateral control side which was not injected was
also surgically excised and sent for histopathology examination. After the body reduction surgery the subjects returned for a 30-day post-op visit to assess adverse events that may have been related to the procedure.

RESULTS: To date no unanticipated adverse events related to the product were observed in this study and all treatment symptoms resolved within 11 days. Histological examination of the tissue showed no inflammation.

CONCLUSION: This study documents the safety of allograft adipose tissue injections in the hypodermis of healthy adults. The implants were derived from donated, cadaveric adipose tissue yielding an acellular, lipid-free, flowable implant composed mostly of ECM proteins in a physiological saline solution. Processing of this tissue included the retention of native growth factors known to promote host healing and remodeling of the matrix and de novo adipogenesis.

Impact of Observer Age and Gender On the Visual Processing of Faces

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INTRODUCTION: Our research is fundamentally interested in the factors leading to the differential perception of patients with congenital or acquired facial difference. The scientific literature has provided little information regarding the impact of observer age and gender on the early stages of visual processing of the human face. In order to investigate the impact of those factors, we employed eye-tracking technology.

PURPOSE: Our goal is to better understand how faces are perceived with the knowledge that early perception may have long-term implications on relationship development. Elucidation of early visual processing of faces may better inform surgeons’ conversations with their patients by improving understanding of how faces are reflexively interpreted by others. This knowledge may also help focus surgical reconstructive priorities.

METHODS: 118 experimental and 79 control facial images were obtained from the senior author’s practice. Experimental images included: 29 cleft lip, 22 facial aging, 18 facial lesion, 16 ear deformity, 14 HIV lipodystrophy, 11 nasal deformity, 6 dermatochalasis. Control images were age-matched to experimental.

Twenty standardized lookzone regions were mapped onto each facial image.

265 subjects were recruited to observe a randomly chosen subset of 40 images (20 experimental/20 control age-matched) while an infrared eye-tracking camera continuously recorded their pupillary response.

Factorial ANOVA analysis was performed to determine significance of differences between groups.

OUTCOMES MEASURED: The total number of eye fixations within different lookzone regions was recorded. Factorial ANOVA analysis was performed to determine significance of gaze patterns between groups.

RESULTS: The following observations were statistically significant at p<0.01 level:

(i) women look at the periorbital region more than men do; men look at the middle facial region more than women do
(ii) women and men both look at women’s eyes more than at men’s eyes
(iii) older observers look at the perioral region more and the periorbital region less than younger observers

CONCLUSIONS: By describing the age and gender-related patterns of reflexive facial surveillance, this report offers a more nuanced idea about where and how we inspect human faces than has previously been documented in the literature. A construct emerges from this study suggesting that the gender of both observer and facial object, as well as the age of the observer, influence the visual focus of early impression formation.

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