Turning Back the Clock: Artificial Intelligence Recognition of Age Reduction after Facelift Surgery Correlates with Patient Satisfaction

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INTRODUCTION: Patients desire facelifting procedures primarily to look younger, more refreshed, and attractive. Since there are few objective studies assessing the success of facelift surgery, we utilized artificial intelligence, in the form of convolutional neural network algorithms alongside FACE-Q patient-reported outcomes to evaluate perceived age reduction and patient satisfaction following facelift surgery.

METHODS: Standardized preoperative and postoperative (1 year) images of 50 consecutive patients who underwent facelift procedures (plastymaplasty, SMAS-ectomy, cheek MACS-lift, fat grafting) were used by four neural networks (trained to identify age based on facial features) to estimate age reduction after surgery. In addition, FACE-Q surveys were used to measure patient-reported facial aesthetic outcome. Patient satisfaction was compared to age reduction.

RESULTS: The neural network Preoperative Age Accuracy Score demonstrated that all four neural networks were accurate in identifying ages (mean score=100.8). Patient Self-Appraisal Age Reduction reported a greater age reduction than Neural Network Age Reduction after a facelift (-6.7years vs-4.3years). FACE Q scores demonstrated a high level of patient satisfaction for facial appearance (75.1$\pm$8.1), quality of life (82.4$\pm$8.3), and satisfaction with outcome (79.0$\pm$6.3). Finally, there was a positive correlation between neural network age reduction and patient satisfaction.

CONCLUSION: Artificial intelligence algorithms can reliably estimate the reduction in apparent age after facelift surgery; this estimated age reduction correlates with patient satisfaction.