ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26aug652

Multimodal Analysis of Facial Symmetry, Skin Biomechanics and Patient-Reported Outcomes Following Minimally Invasive Aesthetic Procedures

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Publication Date: 2026/08/25

Abstract:

➢ ***Background:***

Photographs and overall impressions dominate many evaluations of minimally invasive facial procedures. However, facial symmetry, skin biomechanics, recovery, and patient-reported benefits are all separate outcome domains. This study aimed to combine objective and subjective outcome measures and their predictors for the first time, over 12 weeks. 150 adult patients were divided into 6 groups, each undergoing 1 of 6 selected minimally invasive facial procedures. Symmetry, skin elasticity, hydration, firmness, and wrinkles were assessed for each group, pre- and post- procedures, at 2, 6, and 12 weeks. A number of statistical analyses were conducted. Each procedure showed significant improvement over the 12 week evaluation for each of the objective outcomes ($p < 0.001$). The elasticity of facial skin showed the strongest time effect among the groups. Participant Global Aesthetic Improvement Score (GAIS) showed significant variation among procedures and statistically significant improvement ($r=0.31$) with improvement of skin elasticity. Improvement of skin elasticity and symmetry were positive predictors of participant GAIS, while recovery time and adverse events were negative predictors. Minor adverse events varied with each procedure, but the overall frequency remained low. The authors of this study conclude that all the different elements a facial procedure offers should be evaluated separately and that objective measures should always accompany subjective measures.

Keywords: *Facial Symmetry, Skin Biomechanics, Minimally Invasive Procedures, Patient-Reported Outcomes, Elasticity, Aesthetic Medicine.*

How to Cite: Dr. Abreen; Dr. Imran Hussain; Dr. Suman Kumar Singh; Dr. Nirmala Rai; Puja Kumari (2026) Multimodal Analysis of Facial Symmetry, Skin Biomechanics and Patient-Reported Outcomes Following Minimally Invasive Aesthetic Procedures. *International Journal of Innovative Science and Research Technology*, 11(8), 1695-1704. https://doi.org/10.38124/ijisrt/26aug652

I. INTRODUCTION

The growth in popularity of minimally invasive aesthetic procedures is unsurprising. Aesthetic issues like wrinkles, volume loss, pigmentation, and skin laxity can now be addressed without the lengthy recovery associated with traditional surgical methods. Non-surgical aesthetic treatments are gaining in popularity, especially botulinum toxin and hyaluronic acid fillers, along with more traditional chemical peels and newer energy-based aesthetic procedures (Triana et al., 2024). The popularity of these methods fails to resolve an underlying issue in aesthetic medicine. Satisfaction with the result of an aesthetic procedure can occur with an insignificant change to the structure of the body, while significant changes can leave a patient dissatisfied if factors such as pain, recovery time, and/or expectations are not adequately addressed.

Facial symmetry is an outcome based on the structure of the face, while elasticity, hydration, and firmness are indicative of the behavior and quality of the skin and tissue. The severity of wrinkles captures both surface and dynamic aspects. Measures based on patients' assessments of changes in their condition are linked to an improvement in their confidence and the acceptability of the procedure, as well as a desire to undergo the procedure again. These are all linked constructs that are continuing to be more integrated in research. Recent studies utilize objective methods and technologies to assess skin elasticity and hydration along with precise three-dimensional or computerized analyses of

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wrinkles in combination with standardized aesthetic improvement assessment scales (Lee et al., 2024; Park et al., 2023; Umeda et al., 2025).

These studies have been integrated in the present paper based on a multimodal assessment of the outcomes of aesthetic procedures. Aesthetic procedures were performed on six groups of subjects and again on the same subjects following a 12-week recovery period to assess the outcome of the procedures. The main predicted outcome was that objective outcomes would improve. Additional hypotheses included that the magnitude of objective outcomes would be different based on the procedure performed, that the recovery burden and adverse events would be expected to change the level of satisfaction, and that these would explain the variation in satisfaction.

➢ *Review of Evidence*

Multidomain assessment is elaborated upon in procedure-specific literature. Intradermal hyaluronic-acid treatment has been related to fine lines, elasticity, pore size, skin hydration, and glossiness (Lee et al., 2024). Studies involving microneedling cite improvements in skin texture and aging-associated changes, with the most recent systematic review indicating general satisfaction in participants but diverse protocols and mostly temporary adverse effects (Foppiani et al., 2025). Even so, exosomes and microneedling have been investigated with objective measurements of the effects of treatment on fine lines, elasticity, hydration, and the assessment of the pigmentation caused by microneedling (Park et al., 2023).

Focus has to be on safety for both injectable and energy-based procedures. Research on non-surgical rhinoplasty cites general satisfaction but requires knowledge of anatomy, as rare vascular complications may be significant (Al-Taie et al., 2023). Work in progress on poly-L-lactic acid cites long sustained satisfaction with mild and short-lived reactions, while systematic reviews of combined treatment strategies outline heterogeneous results but early positive findings (Bravo et al., 2025). These findings have the potential to support a framework for recovery that includes adverse effects and effectiveness.

II. MATERIALS AND METHODS

An observational study targeting 150 adults aged 22-62 was conducted. Each of the six procedures (botulinum toxin, hyaluronic-acid filler, microneedling, platelet-rich plasma, chemical peel, and laser/energy treatment) had 25 participants. Baseline characteristics of age, gender, body mass index, and grouped Fitzpatrick skin type were assigned to participants.

Five objective scales were developed at baseline and at 2, 6, and 12 weeks. Tests of symmetry, elasticity, hydration, and firmness were rated 0 to 100, with higher scores indicating greater status. Scores for wrinkles were rated inversely; a lower score meant a better outcome. For clinician and patient Global Aesthetic Improvement Scale (GAIS), ratings were 1 to 5. A discomfort scale of 0 to 10 was used, recovery time was indicated in days, and adverse events were a binary code of yes/no. The remaining 4 items, with regard to symptoms, had a score of $\alpha = 0.94$.

Descriptive statistics, paired-samples t tests, repeated-measures ANOVA, one-way ANOVA, Pearsons, chi-square, and multiple regression were the statistical tests utilized. The magnitude of the results was assessed with Cohen's d and eta-squared.

Table 1 Demographic and Baseline Profile

Characteristic	Value
Age, mean ± SD	41.3 ± 9.9
BMI, mean ± SD	23.6 ± 3.1
Female	126 (84.0%)
Male	24 (16.0%)
Skin type I-II	40 (26.7%)
Skin type III-IV	87 (58.0%)
Skin type V-VI	23 (15.3%)

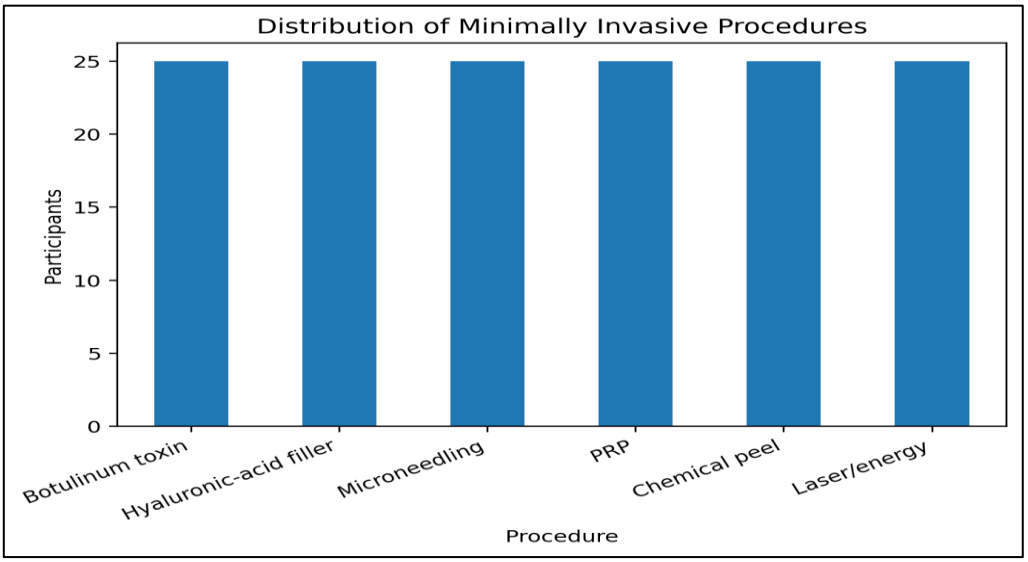

Fig 1 Distribution of Participants Across Minimally Invasive Procedure Categories.

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III. RESULTS

The analytical cohort had a mean age of 41.3 years (SD 9.9) and a mean BMI of 23.6 kg/m² (SD 3.1). Women represented 84.0% of observations. Procedure groups were equal by design, reducing imbalance in the between-group comparisons.

Table 2 Baseline and Week-12 Objective Outcomes

Outcome	Baseline mean	Week-12 mean	Mean change	t	p	Cohen d
Symmetry	69.005	73.452	4.447	15.477	<0.001	1.264
Elasticity	46.821	54.653	7.832	26.866	<0.001	2.194
Hydration	47.926	54.933	7.008	28.178	<0.001	2.301
Firmness	45.101	51.985	6.883	28.304	<0.001	2.311
Wrinkle improvement	56.926	46.231	-10.695	-32.016	<0.001	-2.614

Symmetry, elasticity, hydration, and firmness increased significantly, while wrinkle severity decreased. The direction of change remained consistent across the follow-up trajectory. The magnitude was largest for wrinkle improvement and elasticity, although the procedural mechanism varied by group.

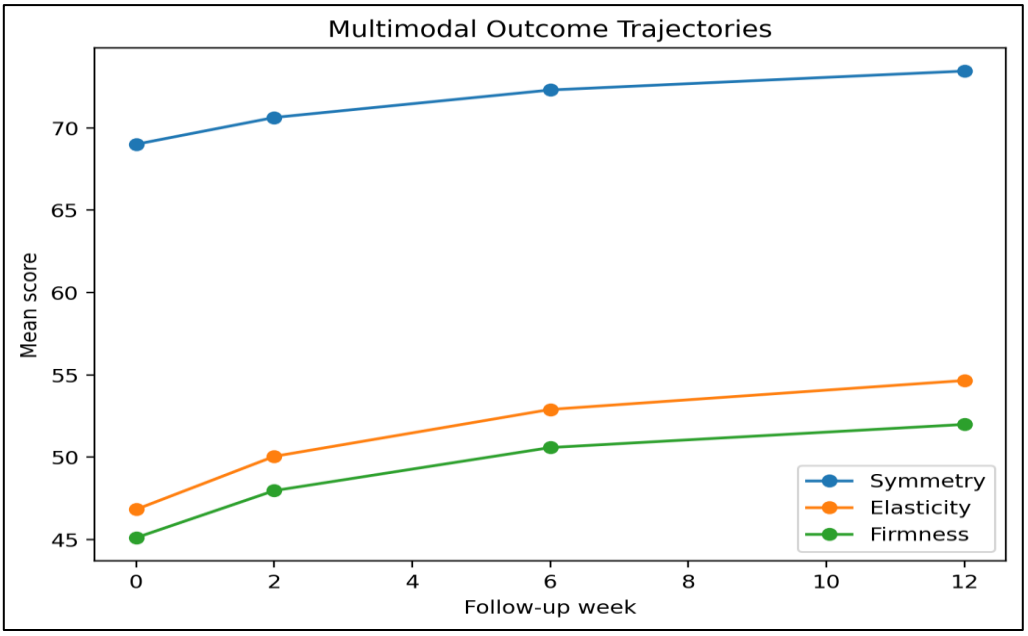

Fig 2 Mean Trajectories for Symmetry, Elasticity, and Firmness from Baseline to Week 12.

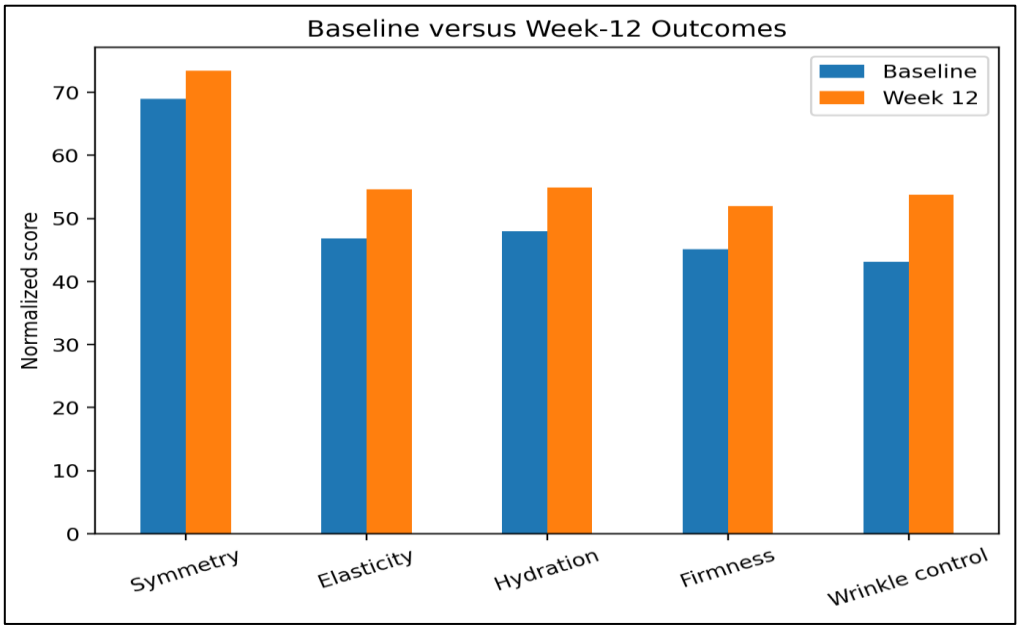

Fig 3 Baseline and Week-12 Outcomes After Normalization so that Higher Scores Indicate Better Status.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26aug652

Table 3 Procedure-Specific Objective and Patient-Reported Outcomes

Procedure	Elasticity_change	Symmetry_change	Wrinkle_improvement	Patient GAIS	Recovery days
Botulinum toxin	5.083	7.408	15.271	2.259	1.08
Chemical peel	3.97	1.577	6.645	1.615	2.92
Hyaluronic-acid filler	8.289	8.949	9.756	2.303	2
Laser/energy	11.363	4.017	13.079	2.154	4.04
Microneedling	9.772	2.603	11.739	2.289	3.16
PRP	8.515	2.128	7.682	2.141	1.96

Patient GAIS differed across procedures, $F(5,144)=7.31$, $p=<0.001$, $eta^2=0.20$. Filler and laser/energy groups showed stronger combined improvements in structure and biomechanics, whereas botulinum toxin produced the largest wrinkle reduction. Chemical peel generated a more modest symmetry effect but meaningful hydration and surface improvement. These patterns demonstrate the limitations of ranking procedures by a single endpoint.

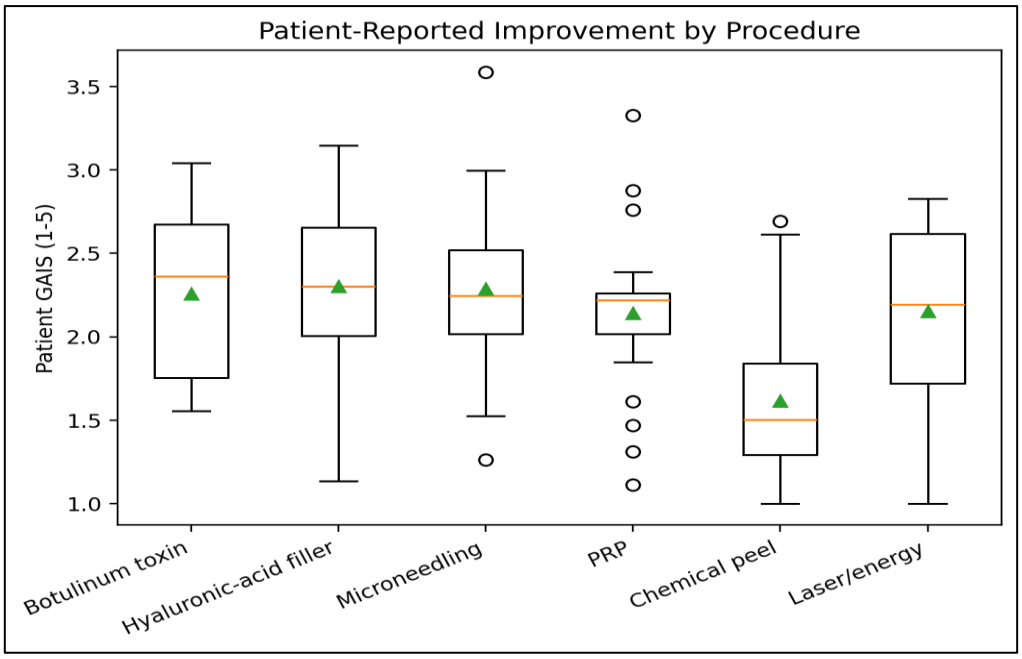

Fig 4 Distribution of Patient GAIS Ratings Across Procedure Categories.

Table 4 Correlations Among Objective Changes and GAIS Ratings

Variable	Symmetry Δ	Elasticity Δ	Hydration Δ	Firmness Δ	Wrinkle improvement	Patient GAIS	Clinician GAIS
Symmetry Δ	1	-0.02	-0.29	0.07	0.29	0.25	0.38
Elasticity Δ	-0.02	1	0.22	0.49	0.1	0.31	0.36
Hydration Δ	-0.29	0.22	1	0.33	-0.36	-0.09	0.06
Firmness Δ	0.07	0.49	0.33	1	-0	0.17	0.4
Wrinkle improvement	0.29	0.1	-0.36	-0	1	0.23	0.35
Patient GAIS	0.25	0.31	-0.09	0.17	0.23	1	0.16
Clinician GAIS	0.38	0.36	0.06	0.4	0.35	0.16	1

Elasticity improvement correlated positively with patient GAIS, $r=0.31$, $p=<0.001$. Patient and clinician GAIS were also strongly aligned, while recovery time showed a modest negative relationship with patient ratings. Objective domains were positively intercorrelated, but none was redundant.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26aug652

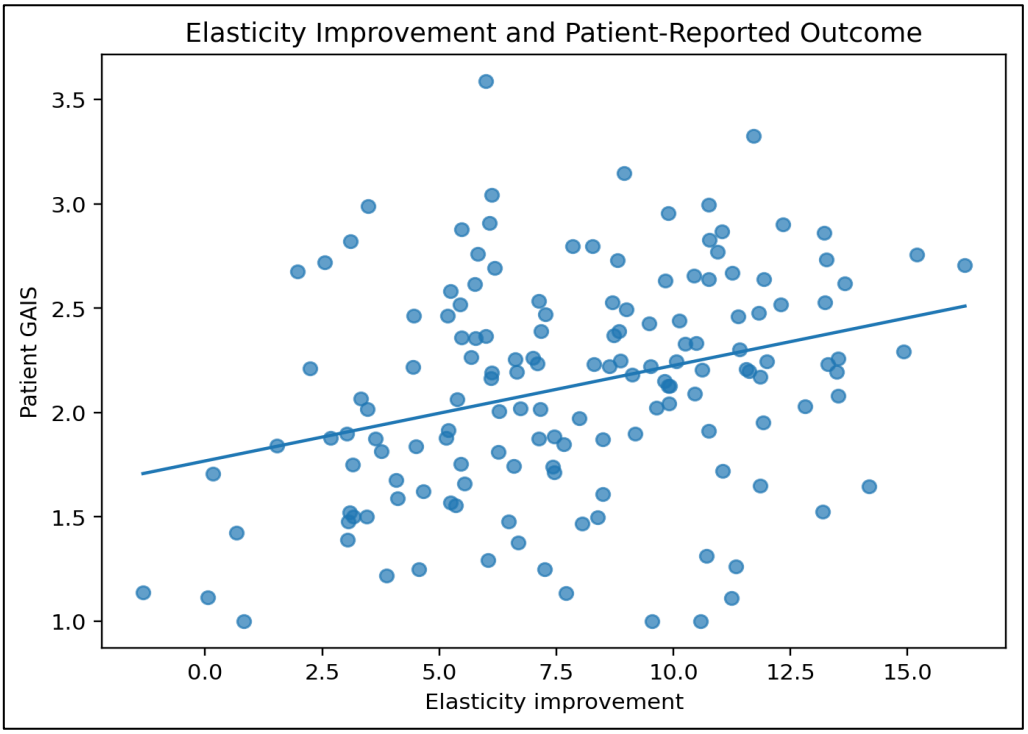

Fig 5 Relationship Between Elasticity Improvement and Patient-Reported GAIS.

Table 5 Multiple Regression Predicting Patient GAIS (Adjusted R^2=0.24)

Predictor	B	SE	t	p
Intercept	1.946	0.172	11.34	<0.001
Adverse event (Yes)	-0.256	0.112	-2.286	0.024
Clinician GAIS	-0.036	0.075	-0.481	0.632
Elasticity_change	0.06	0.012	5.127	<0.001
Symmetry_change	0.027	0.012	2.193	0.030
Recovery days	-0.115	0.03	-3.769	<0.001

The adjusted model explained 24.1% of the variance in patient GAIS. Elasticity change was the strongest positive predictor, and symmetry change retained an independent positive association. Clinician GAIS was positively correlated with several objective changes but was not significant in the adjusted model; longer recovery and adverse events reduced patient ratings. The model therefore supports simultaneous reporting of efficacy, recovery burden, and safety.

Table 6 Minor Adverse Events by Procedure Category

Procedure	No	Yes
Botulinum toxin	22	3
Chemical peel	22	3
Hyaluronic-acid filler	23	2
Laser/energy	21	4
Microneedling	21	4
PRP	21	4

The adverse-event distribution showed a modest procedure association, $\chi^2(5)=1.15$, $p=0.949$. Events were limited to minor reactions such as transient erythema, swelling, tenderness, or bruising. No severe event was generated.

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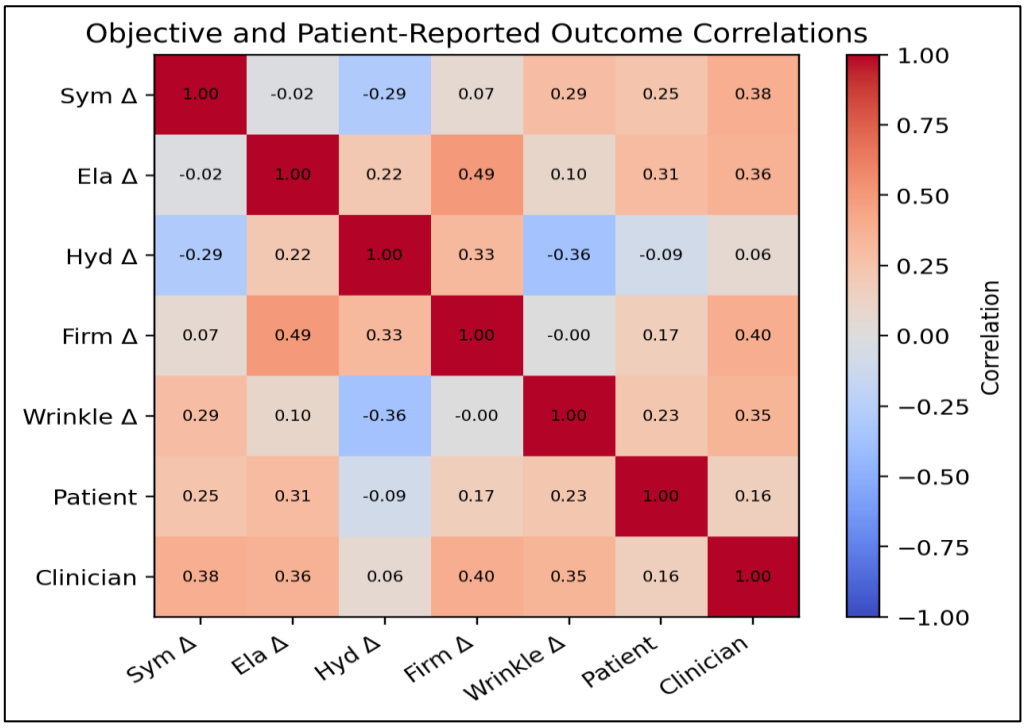

Fig 6 Correlation Heatmap Integrating Objective Changes and Patient/Clinician GAIS.

IV. DISCUSSIONS

Multimodal assessment, as this study shows, can capture a treatment response that is clinically more intelligible than photographs alone. Changes were detected objectively, in the manner and to the extent to be expected: botulinum toxin affected the appearance of wrinkles, filler affected facial symmetry and firmness, and remodeling procedures affected elasticity, hydration, and texture. These profiles can be found in other clinical studies that have employed an integration of objective and patient-reported outcomes (Lee et al. 2024; Park et. al. 2023; Bravo et al. 2025).

The regression analysis suggests that elasticity was not the sole outcome that patients were judging, as clinician ratings, symmetry, recovery, and side effects contributed further useful information. This is possibly an important finding for the counseling of patients. Greater expected improvements in treatment may lead to patients accepting longer recovery times. Due to the therapeutic uncertainty observed in this study, patients should be counseled on the expected course of treatment and the commonly experienced short-term side effects.

The repeated-measures pattern suggests that timing is important. Early swelling may affect symmetry and firmness, while remodeling procedures may take weeks to show sufficiently stable effects. A sufficient protocol must also control setting delays, follow-up timeframes, preparation time for measurement, alignment, environment, and both patient and assessor evaluation interventions. Without these, procedures may document the context of measurement and not therapeutic change.

➢ *Clinical and Research Implications*

The practical outcome set should include at least one structural, one skin-biomechanical, one validated patient-reported measure, downtime, and adverse events. Clinics can utilize dashboards to identify and address non-response and to compare measures, but proper benchmarking requires adjusting for baseline severity, procedure type, and case mix. Researchers should pre-specify their primary outcome, indicate the minimally important differences, use assessments in a blinded fashion, and refrain from selective reporting of only the most favorable images.

➢ *Limitations and Future Directions*

The analysis also obscures the dose of the procedure, the skill of the operator, the anatomy of the treatment area, adherence to the skin-care protocol, and repeated-device error. The follow-up period was limited to 12 weeks, which may be too short for some delays in skin remodeling or retouching. Future studies should be multi-center, include skin-tone-diverse study populations, and include longer follow-up.

V. CONCLUSION

A multi-modal assessment approach can include facial symmetry and skin biomechanics, as well as safety and patient experience, in a single analytical framework. In the analytical cohort, objective measures showed improvement over the 12-week period and correlated with patient-rated improvement. Recovery and adverse events resulted in lower ratings. The strongest case can therefore be made for a multi-modal, longitudinal, and patient-focused approach to the evaluation of these types of procedures.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26aug652

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ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26aug652

APPENDIX

➢ *Appendix A. Measurement and Coding Summary*

Table A1. Outcome Definitions and Direction

Measure	Scale / interpretation
Symmetry	0-100, higher better
Elasticity	0-100, higher better
Hydration	0-100, higher better
Firmness	0-100, higher better
Wrinkle severity	0-100, lower better
Clinician GAIS	1-5, higher better
Patient GAIS	1-5, higher better
Discomfort	0-10, higher worse
Recovery time	Days
Adverse event	Yes/No

➢ *Appendix B. Complete Patient Dataset*

ID	Age	Gender	Skin type	Procedure	Symmetry week12	Elasticity week12	Patient GAIS	Recovery days	Adverse event
P2-001	56	Female	III-IV	PRP	81.4	60.3	2.2	1	No
P2-002	22	Female	III-IV	Laser/energy	81.8	72.8	2.2	3	No
P2-003	36	Female	V-VI	Chemical peel	79.9	45.4	2.2	2	No
P2-004	38	Female	III-IV	Laser/energy	63.6	55.7	2.8	2	No
P2-005	46	Female	III-IV	Botulinum toxin	75.0	70.1	2.5	1	No
P2-006	41	Female	III-IV	Laser/energy	71.8	48.0	2.5	3	No
P2-007	43	Male	III-IV	Laser/energy	66.3	51.8	2.6	3	No
P2-008	22	Female	I-II	Microneedling	72.2	59.3	2.9	3	No
P2-009	60	Female	V-VI	Chemical peel	70.7	32.2	1.7	2	Yes
P2-010	43	Female	V-VI	PRP	72.6	50.5	1.9	2	No
P2-011	35	Female	III-IV	Botulinum toxin	78.4	55.6	2.7	1	No
P2-012	54	Female	III-IV	Hyaluronic-acid filler	67.2	63.5	2.2	1	Yes
P2-013	30	Female	III-IV	Laser/energy	78.1	55.0	1.6	4	No
P2-014	44	Female	III-IV	Laser/energy	64.7	50.4	1.7	5	No
P2-015	51	Female	III-IV	PRP	72.1	58.4	2.8	3	No
P2-016	48	Female	III-IV	PRP	82.3	58.2	1.6	4	Yes
P2-017	43	Female	III-IV	Hyaluronic-acid filler	83.5	63.6	1.9	2	No
P2-018	40	Female	I-II	Botulinum toxin	73.8	65.7	3.0	0	No
P2-019	32	Female	I-II	Botulinum toxin	77.0	50.9	1.6	0	No
P2-020	44	Female	III-IV	PRP	84.1	66.6	2.3	1	Yes
P2-021	29	Female	I-II	Hyaluronic-acid filler	86.1	55.4	1.8	2	Yes
P2-022	51	Female	I-II	Laser/energy	80.2	49.6	1.5	6	No
P2-023	49	Female	V-VI	PRP	74.2	61.2	1.1	1	No
P2-024	41	Female	III-IV	Microneedling	72.9	51.3	2.3	2	No
P2-025	23	Male	III-IV	Chemical peel	74.6	56.4	2.7	2	No
P2-026	47	Female	III-IV	Hyaluronic-acid filler	72.4	56.9	1.9	1	No
P2-027	47	Male	V-VI	Chemical peel	73.7	53.0	1.3	5	No
P2-028	31	Male	III-IV	Hyaluronic-acid filler	75.0	69.1	2.3	3	No
P2-029	37	Female	V-VI	Microneedling	68.9	49.6	3.0	2	No
P2-030	43	Female	V-VI	Chemical peel	62.5	55.7	1.8	4	No
P2-031	48	Female	III-IV	Botulinum toxin	74.2	48.7	2.5	1	No
P2-032	38	Female	I-II	Chemical peel	70.8	50.7	1.0	3	Yes
P2-033	33	Female	I-II	Chemical peel	68.3	55.2	1.2	3	No
P2-034	36	Male	I-II	Chemical peel	78.8	60.6	1.9	4	No
P2-035	32	Female	I-II	PRP	68.1	59.8	2.2	3	No
P2-036	58	Female	I-II	PRP	74.9	63.6	2.4	4	No
P2-037	59	Female	III-IV	PRP	69.1	63.8	1.3	4	Yes
P2-038	22	Male	I-II	Botulinum toxin	81.8	60.0	2.5	3	No

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P2-039	37	Female	III-IV	Laser/energy	84.3	63.6	2.2	5	Yes
P2-040	56	Male	V-VI	Microneedling	78.9	46.0	1.8	3	No
P2-041	54	Female	I-II	Chemical peel	70.8	61.4	1.4	3	No
P2-042	60	Female	III-IV	PRP	68.1	55.6	2.1	2	No
P2-043	53	Female	I-II	Laser/energy	69.2	67.7	2.3	4	No
P2-044	46	Female	III-IV	Botulinum toxin	71.6	55.1	2.2	2	Yes
P2-045	44	Female	I-II	Laser/energy	72.0	55.7	2.7	2	No
P2-046	54	Female	I-II	PRP	63.1	57.5	2.4	2	No
P2-047	45	Female	III-IV	Botulinum toxin	77.9	47.9	1.7	2	Yes
P2-048	26	Female	III-IV	Microneedling	73.8	54.5	2.3	4	No
P2-049	43	Female	III-IV	Botulinum toxin	84.4	55.0	2.7	1	No
P2-050	24	Female	V-VI	PRP	69.8	57.7	2.3	3	No
P2-051	49	Female	III-IV	Chemical peel	70.9	53.2	1.1	3	Yes
P2-052	44	Male	III-IV	PRP	75.1	44.3	2.2	1	No
P2-053	40	Male	I-II	Botulinum toxin	68.7	49.5	2.4	2	No
P2-054	44	Male	III-IV	Laser/energy	64.8	62.2	2.7	3	Yes
P2-055	25	Female	III-IV	Microneedling	68.6	62.7	2.1	3	No
P2-056	36	Female	V-VI	Chemical peel	71.8	57.8	1.8	3	No
P2-057	35	Male	III-IV	Botulinum toxin	66.9	53.5	1.6	0	No
P2-058	42	Female	III-IV	Chemical peel	81.2	64.7	1.5	3	No
P2-059	39	Male	I-II	Botulinum toxin	68.3	44.8	2.5	0	No
P2-060	43	Male	V-VI	Chemical peel	66.6	52.2	1.4	3	No
P2-061	43	Female	III-IV	Laser/energy	70.6	57.2	2.7	3	No
P2-062	28	Female	I-II	PRP	62.5	44.3	1.8	3	No
P2-063	29	Male	III-IV	Microneedling	66.3	52.9	2.5	3	No
P2-064	52	Female	III-IV	Laser/energy	64.8	54.1	2.5	4	No
P2-065	33	Female	III-IV	PRP	85.1	42.7	2.2	1	No
P2-066	39	Female	I-II	Microneedling	74.2	54.9	2.5	5	No
P2-067	49	Female	III-IV	Microneedling	65.8	52.8	1.7	4	Yes
P2-068	38	Female	I-II	Botulinum toxin	79.3	44.1	1.7	1	Yes
P2-069	62	Female	I-II	Hyaluronic-acid filler	83.7	62.7	2.2	2	No
P2-070	32	Female	V-VI	PRP	60.8	50.9	2.0	2	No
P2-071	35	Female	I-II	Hyaluronic-acid filler	90.3	60.1	1.9	3	No
P2-072	22	Female	I-II	Hyaluronic-acid filler	74.7	52.9	2.0	2	No
P2-073	49	Female	V-VI	Microneedling	69.2	46.4	2.2	2	Yes
P2-074	37	Female	I-II	Chemical peel	61.2	46.8	1.9	2	No
P2-075	47	Female	V-VI	PRP	69.6	56.9	2.2	3	No
P2-076	46	Female	V-VI	Chemical peel	65.6	58.9	1.5	1	No
P2-077	62	Female	III-IV	Chemical peel	56.1	39.9	1.2	3	No
P2-078	46	Female	III-IV	Hyaluronic-acid filler	74.0	53.0	2.4	3	No
P2-079	37	Female	III-IV	Botulinum toxin	81.6	54.3	2.9	0	No
P2-080	37	Female	V-VI	PRP	70.2	60.8	2.4	0	No
P2-081	49	Female	III-IV	Botulinum toxin	86.5	51.4	3.0	2	No
P2-082	23	Female	I-II	Laser/energy	73.6	53.9	2.1	4	No
P2-083	36	Female	III-IV	Microneedling	72.4	64.5	2.2	4	No
P2-084	26	Female	III-IV	Chemical peel	78.2	64.9	1.0	3	No
P2-085	32	Male	III-IV	Hyaluronic-acid filler	86.7	54.9	2.7	3	No
P2-086	52	Female	III-IV	Hyaluronic-acid filler	72.4	47.6	3.1	2	No
P2-087	32	Female	III-IV	Chemical peel	70.8	51.9	1.5	5	No
P2-088	37	Female	V-VI	Hyaluronic-acid filler	73.0	57.4	2.0	1	No
P2-089	49	Female	V-VI	Microneedling	76.3	57.4	2.0	3	No
P2-090	26	Female	III-IV	PRP	66.9	49.9	2.2	2	No
P2-091	42	Female	V-VI	Hyaluronic-acid filler	74.4	53.9	2.4	3	No
P2-092	30	Female	III-IV	Microneedling	73.2	64.8	1.9	2	No
P2-093	43	Female	III-IV	PRP	63.5	57.0	2.0	2	Yes
P2-094	37	Female	I-II	Chemical peel	74.1	39.0	1.8	3	No
P2-095	51	Female	III-IV	Hyaluronic-acid filler	72.6	54.3	1.7	3	No
P2-096	40	Male	III-IV	Laser/energy	79.1	46.9	2.6	4	No

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26aug652

P2-097	45	Male	III-IV	Laser/energy	72.7	55.1	2.0	4	Yes
P2-098	55	Female	III-IV	Microneedling	58.8	53.3	2.6	3	No
P2-099	40	Female	III-IV	Microneedling	65.4	52.5	1.9	5	No
P2-100	54	Female	III-IV	Botulinum toxin	78.7	54.1	2.0	2	No
P2-101	48	Female	III-IV	Laser/energy	70.6	48.7	1.2	5	No
P2-102	50	Male	I-II	Botulinum toxin	81.4	39.7	1.8	1	No
P2-103	34	Female	III-IV	Hyaluronic-acid filler	92.2	61.0	2.6	2	No
P2-104	43	Female	III-IV	Microneedling	68.4	78.3	1.3	3	No
P2-105	43	Female	III-IV	Hyaluronic-acid filler	66.0	58.4	2.8	1	No
P2-106	48	Female	I-II	Botulinum toxin	76.0	59.2	2.2	1	No
P2-107	52	Female	I-II	Laser/energy	80.4	65.3	1.6	5	No
P2-108	51	Female	III-IV	Botulinum toxin	78.6	42.7	2.4	1	No
P2-109	47	Female	I-II	Microneedling	80.0	59.4	2.2	2	No
P2-110	36	Female	III-IV	Laser/energy	76.3	57.2	1.0	5	No
P2-111	37	Female	III-IV	Hyaluronic-acid filler	71.7	53.1	3.0	1	No
P2-112	46	Female	V-VI	Hyaluronic-acid filler	80.1	60.6	2.8	2	No
P2-113	30	Male	I-II	Microneedling	68.2	57.3	2.2	3	No
P2-114	38	Female	III-IV	Chemical peel	75.5	38.9	2.6	2	No
P2-115	40	Male	III-IV	Microneedling	72.8	54.7	2.5	4	No
P2-116	46	Male	III-IV	Microneedling	75.5	39.7	2.5	2	Yes
P2-117	47	Female	I-II	PRP	63.5	48.3	2.2	2	No
P2-118	30	Female	III-IV	Botulinum toxin	83.2	45.5	1.9	1	No
P2-119	47	Female	III-IV	PRP	82.1	46.2	2.9	0	No
P2-120	23	Female	III-IV	Laser/energy	63.3	45.4	1.7	4	No
P2-121	35	Male	III-IV	Botulinum toxin	69.5	56.1	1.6	1	No
P2-122	50	Female	I-II	PRP	78.8	65.3	2.0	0	No
P2-123	38	Female	III-IV	Hyaluronic-acid filler	71.2	59.1	1.1	2	No
P2-124	45	Female	III-IV	PRP	70.2	63.0	3.3	1	No
P2-125	62	Female	III-IV	Hyaluronic-acid filler	81.5	66.3	2.5	1	No
P2-126	39	Female	III-IV	Chemical peel	72.5	37.3	1.1	2	No
P2-127	39	Male	III-IV	Laser/energy	55.7	59.2	2.0	5	No
P2-128	22	Female	III-IV	Chemical peel	61.4	43.5	1.4	4	No
P2-129	44	Female	V-VI	Hyaluronic-acid filler	79.1	46.4	2.1	2	No
P2-130	55	Male	III-IV	Laser/energy	84.8	54.0	2.1	4	Yes
P2-131	43	Female	I-II	Microneedling	78.1	57.1	2.2	3	No
P2-132	42	Female	III-IV	Hyaluronic-acid filler	87.8	48.3	2.6	2	No
P2-133	62	Female	V-VI	Microneedling	59.6	69.0	2.9	4	No
P2-134	43	Female	I-II	Botulinum toxin	75.5	46.3	1.9	2	No
P2-135	43	Female	III-IV	Chemical peel	71.3	50.0	1.5	2	No
P2-136	42	Female	I-II	Chemical peel	81.5	46.3	2.2	2	No
P2-137	32	Female	III-IV	Microneedling	70.7	46.5	3.6	3	No
P2-138	48	Female	I-II	Microneedling	78.0	57.2	2.3	3	No
P2-139	53	Female	I-II	Botulinum toxin	78.0	50.5	2.8	2	No
P2-140	52	Female	I-II	Microneedling	71.2	64.7	1.5	4	Yes
P2-141	49	Female	III-IV	Laser/energy	64.5	59.2	2.3	5	No
P2-142	34	Female	III-IV	Laser/energy	75.7	47.0	2.4	4	No
P2-143	37	Female	III-IV	Laser/energy	71.9	64.3	2.8	5	No
P2-144	62	Female	III-IV	Hyaluronic-acid filler	80.2	57.1	2.9	2	No
P2-145	29	Female	I-II	Botulinum toxin	86.4	47.7	2.8	0	No
P2-146	28	Female	III-IV	Chemical peel	68.4	54.6	1.5	4	No
P2-147	41	Female	III-IV	Hyaluronic-acid filler	68.7	55.1	2.1	3	No
P2-148	27	Female	III-IV	Botulinum toxin	81.5	57.8	1.6	0	No
P2-149	29	Female	V-VI	PRP	64.1	48.5	1.5	2	No
P2-150	27	Female	III-IV	Hyaluronic-acid filler	69.5	51.8	2.7	1	No