Original Investigation

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Photogrammetric Comparison of Septal Extension Grafts and Columellar Strut Grafts Reinforced with Septocolumellar Sutures

Süheyla Kandemir, Lütfiye Nisa Caner, Nuray Bayar Muluk, Burak Mustafa Taş, Ziya Şencan, Ela Cömert

Kırıkkale University Faculty of Medicine, Department of Otorhinolaryngology, Kırıkkale, Türkiye

Abstract

Objective: To compare the effects of septal extension (SE) grafts and columellar strut (CS) grafts reinforced with septocolumellar sutures on nasal tip projection, rotation, and patient-reported outcomes in primary rhinoplasty using standardized photogrammetric analysis.

Methods: This retrospective cohort study included 60 patients who underwent primary rhinoplasty between 2019 and 2024 (30 SE and 30 CS grafts reinforced with septocolumellar sutures). Nasal tip projection, rotation, and anthropometric parameters were assessed using Rhinobase software. Functional and esthetic outcomes were evaluated using the Nasal Obstruction Symptom Evaluation Questionnaire (NOSE) and Facial Aesthetic Quality of Life Questionnaire (FACE-Q).

Results: The mean age was 27.8 years, and 70% of the participants were female. The mean postoperative follow-up was 9.5±2.7 months. Although baseline nasal length and tip projection were lower in the SE group, both techniques produced comparable postoperative improvements in nasal tip projection, rotation, and nasal length. Postoperative FACE-Q and NOSE scores were also similar between groups, despite lower preoperative FACE-Q scores in the SE group (p=0.003).

Conclusion: CS grafts reinforced with septocolumellar sutures achieved functional and esthetic outcomes comparable to SE grafts. These findings suggest that septocolumellar suturing may compensate for the structural advantages traditionally attributed to SE grafts in primary rhinoplasty.

Keywords: Rhinoplasty, photogrammetry, nasal septum, nasal cartilages, treatment outcome, patient satisfaction

Introduction

Achieving optimal nasal tip projection (TP) and rotation is a key determinant of rhinoplasty success. Nasal tip stability results from the combined effects of several anatomical and technical factors, such as soft tissue characteristics, including thickness and elasticity, the configuration and rigidity of the alar cartilages, the integrity of intercrural ligamentous structures, domal suture techniques, and the selective use of grafts aimed at establishing a balanced relationship between the medial crura and the infralobular region (1,2).

Anderson (3) first described the biomechanical behavior of the nasal tip through the concept of the nasal tip complex, later termed the tripod theory. According to this model,

ORCID IDs of the authors:

S.K. 0000-0003-3354-2212
L.N.C. 0000-0001-5149-9102
N.B.M. 0000-0003-3602-9289
B.M.T. 0000-0002-1983-5329
Z.Ş. 0000-0002-0936-5108
E.C. 0000-0001-7739-2717

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Corresponding Author:
Süheyla Kandemir, Asst. Prof.;
dr.suheyla_bostan@hotmail.com

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variations in nasal TP and rotation arise from alterations in the relative length and orientation of the medial and lateral crura. In this three-legged support system, the lateral crura act as paired stabilizing components, whereas the medial crura together form the central supporting element.

A wide range of grafting methods has been proposed to maintain or enhance nasal tip support during rhinoplasty. Among these techniques, septal extension (SE) and columellar strut (CS) grafts are the most commonly utilized. The SE graft is secured to the caudal septum and directed toward the anterior septal angle, creating a stable framework for positioning the medial crura and reconstructed domal segments (4). Conversely, the CS graft is placed within a pocket between the medial crura and extended toward the anterior nasal spine, where it provides structural support while allowing a greater degree of flexibility compared with SE grafts (5).

Both grafting methods are designed to improve nasal tip stability and allow modification of projection, medial crural alignment, and columellar show, although their biomechanical behavior and long-term effects may differ (6). Therefore, this study aims to directly compare CS grafts reinforced with septocolumellar sutures with SE grafts by quantitatively evaluating their effects on nasal tip protrusion and rotation using standardized photogrammetric analysis.

Methods

Study Design and Participants

This study was designed as a retrospective cohort analysis and included 60 patients who underwent primary open rhinoplasty at a tertiary referral center between 2019 and 2024. Of these, 30 patients were treated using SE grafts (Group 1), while the remaining 30 patients received CS grafts (Group 2).

To maintain surgical uniformity, the study population was limited to patients on whom all operative steps were performed in an identical manner, except for the technique used for nasal tip support. Patients with a history of prior nasal or maxillofacial surgical interventions were excluded.

Patients with revision rhinoplasty or severe tip deformities requiring advanced structural lateral crural reconstruction were also excluded to maintain surgical homogeneity. As this was a retrospective study, nasal skin thickness was assessed clinically and considered during surgical planning; however, no formal stratification according to skin thickness was performed.

Data Collection

Demographic data (age, sex, follow-up time) were recorded. Esthetic satisfaction was assessed using the Facial Aesthetic Quality of Life Questionnaire (FACE-Q) Nose Satisfaction Scale (10 items), and functional outcomes were evaluated with the Turkish version of the Nasal Obstruction Symptom Evaluation (NOSE) questionnaire (7,8). Both instruments were administered preoperatively and postoperatively.

Photogrammetric Analysis

Standardized pre- and post-operative photographs (frontal, lateral, basal views) were taken by the same investigator using identical camera settings and patient positioning.

Anthropometric measurements were performed using Rhinobase software (version 1.1; İzmir, Türkiye, and Chicago, USA) (9). Which automatically calculates angles and linear distances after calibration with a vertical ruler (9). The software has demonstrated a strong correlation with direct anthropometry (10).

After manual identification of the anatomical landmarks, the software automatically generated all anthropometric measurements (Figure 1a-c). Key parameters included were:

- Nasal TP: alar point-nasal tip line.
- Nasal length (NL): nasion-subnasale distance.
- Nasolabial angle (NLA): columella-subnasale-labrale superius angle.

Preoperative anthropometric parameters, including NLA, NL, and TP, were statistically compared between groups to assess baseline comparability. Baseline differences were taken into account during interpretation of postoperative outcomes, and postoperative changes were analyzed within each group to minimize potential confounding effects.

Surgical Technique

All procedures were conducted under general anesthesia using an open rhinoplasty technique. Surgical access was achieved through an inverted-V transcolumellar incision. Standardized operative steps, including dorsal hump reduction, harvesting of septal cartilage, and lateral osteotomies, were applied uniformly to all patients.

Lower lateral (alar) cartilage modifications, including conservative cephalic trim and interdomal suturing when recorded in operative notes, were performed according to individual anatomical characteristics. These maneuvers were applied similarly in both groups and were not used as primary techniques to alter projection or rotation. No additional structural alar grafts, such as lateral crural strut grafts or alar batten grafts, were employed to differentially influence tip support between groups. Therefore, alar cartilage procedures did not represent an independent variable in comparative analysis.

As this was a retrospective analysis, nasal skin thickness was assessed based on preoperative clinical records and

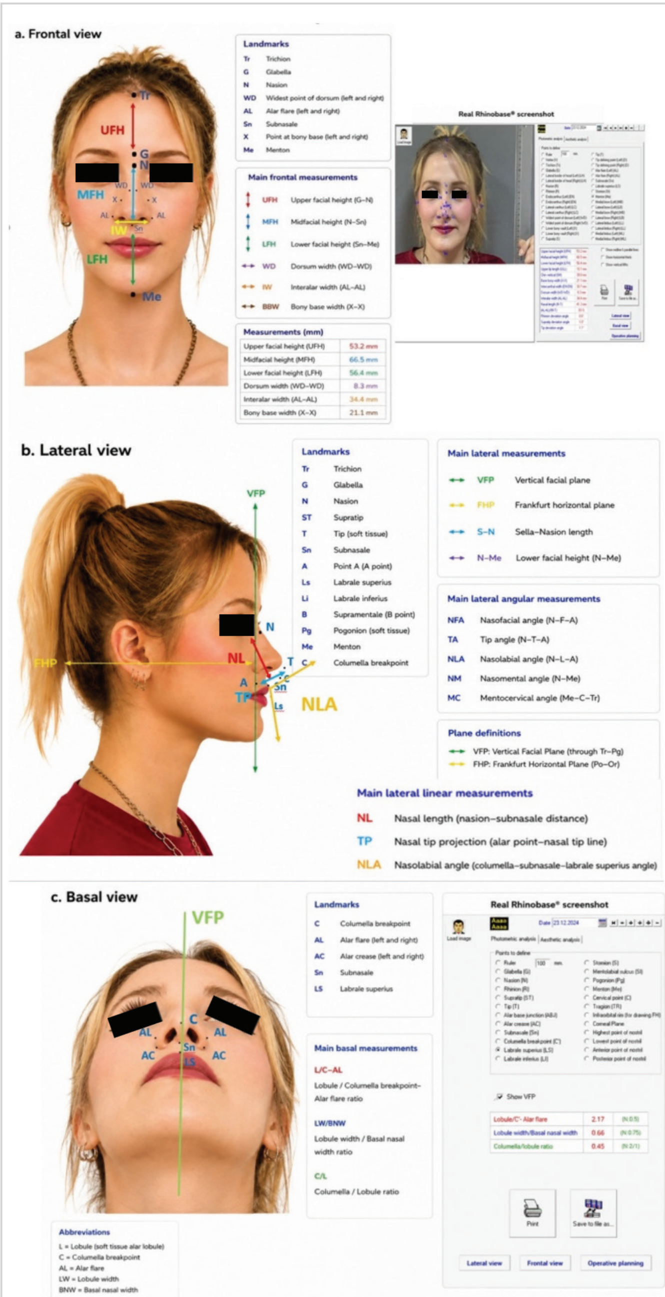

Figure 1. Schematic illustrations and representative Rhinobase® screenshots demonstrating the photogrammetric measurements used in the study. **a)** Frontal view: demonstration of the principal frontal anthropometric measurements and facial landmarks, including upper facial height (UFH), midfacial height (MFH), lower facial height (LFH), dorsum width (WD-WD), interalar width (AL-AL), and bony base width (X-X). **b)** Lateral view: illustration of the principal lateral linear and angular measurements, including nasal length (NL), tip projection (TP), nasolabial angle (NLA), and reference planes vertical facial plane (VFP) and Frankfurt horizontal plane (FHP). **c)** Basal view: illustration of the basal anthropometric measurements and ratios, including the lobule/columella breakpoint-alar flare ratio (L/C-AL), lobule width/basal nasal width ratio (LW/BNW), and columella/lobule ratio (C/L)

standardized photographs. No objective measurement or formal stratification according to skin thickness was performed. Patients with severe soft tissue characteristics requiring advanced structural reconstruction were not included in the comparative evaluation. No differential surgical strategy based solely on skin thickness was applied between groups. The only procedural distinction between the two study groups involved the method used to support the nasal tip. For patients in the SE group, a SE graft was aligned alongside the caudal septum and stabilized with side-to-side sutures. The graft was subsequently anchored to the medial crura to provide structural support (Figure 2d). In the CS group, a CS graft was placed within a prepared soft-tissue pocket between the medial crura and secured directly to these cartilaginous structures (Figure 2e).

In both groups, graft fixation relied on suturing between the graft and the medial crura. Additionally, septocolumellar sutures were applied in the CS group to further refine nasal TP and rotation.

Apaydin et al. (11) previously defined five distinct septocolumellar suture configurations, each capable of modifying nasal TP by increasing, maintaining, or decreasing it. These techniques also influence nasal tip and columellar rotation with varying directional effects depending on the suture type.

Apaydin et al. (11) Classification of Septocolumellar Sutures:

Type 1: The suture is placed between the caudal septum and the soft tissue posterior to the medial crura, providing posterior support for controlled modification of nasal TP.

Type 2: This technique involves fixation between the caudal septum and the inner surface of the medial crura, allowing adjustment of projection with an additional effect on tip rotation.

Type 3: In Type 3 suturing, the caudal septum is anchored to the central portion of the medial crura to achieve balanced control of nasal TP and alignment.

Type 4: The suture approximates the caudal margin of the medial crura to the caudal septum in a tongue-in-groove-like manner, primarily influencing nasal tip rotation and columellar position.

Type 5: This configuration connects the nasal dorsum with the midportion of the medial crura, modifying nasal tip rotation through the ventral septocolumellar relationship.

In our series, all patients were treated using a Type 1 septocolumellar suture, with placement through the soft tissue adjacent to the medial edge of the medial crura, in accordance with the original description (11). Although septocolumellar sutures were used in the CS group to

Figure 2. Intraoperative images demonstrating the grafting techniques used for nasal tip support. **d)** Septal extension graft fixation to the caudal septum, **e)** Columellar strut graft placement between the medial crura

improve TP and rotational control, no SE graft was used. Unlike the SE technique, the CS graft was not fixed side-to-side to the caudal septum to establish a rigid septal framework. Therefore, despite their similar effects on TP and rotational control, the two techniques remain structurally and biomechanically distinct.

Ethical Considerations

Prior to initiation of the study, the research design and data collection procedures were reviewed and authorized by the Non-Interventional Ethics Committee of Kırıkkale University (date of approval: 14.11.2024; reference number: 2024.11.02). Participation was voluntary, and written consent was obtained from all enrolled individuals. Separate written permissions were additionally obtained from patients whose clinical photographs are used for scientific publication.

Statistical Analysis

All statistical analyses were carried out using the SPSS statistical package (IBM SPSS Statistics for Windows, version 21, IBM Corp., Armonk, N.Y., USA). The normality of data distribution was assessed using the Shapiro-Wilk test. Continuous variables were expressed as mean ± standard deviation for normally distributed data and as median (interquartile range) for non-normally distributed data. Categorical variables were presented as frequencies and percentages. For comparisons between the two independent groups (SE vs. CS), the independent samples t-test was used for normally distributed variables, while the Mann-Whitney U test was applied for variables that did not meet the normality assumption. Within-group comparisons (preoperative vs. postoperative) were performed using the paired samples t-test for normally distributed data and the Wilcoxon signed-rank test for non-normally distributed data. Categorical variables, such as sex distribution, were analyzed using the chi-square test. For all analyses, a two-tailed p-value of <0.05 was considered statistically significant.

Results

Sixty patients were included in the analysis, with an equal allocation to the SE graft group (n=30) and the CS graft group (n=30). The two groups were comparable in terms of age (p=0.53), sex distribution (p=0.57), and duration of follow-up (p=0.14), with no measurable differences detected between them. The average postoperative follow-up period was 9.50±2.65 months.

Patient-reported Outcome Measures

Preoperative NOSE scores were similar between the SE and CS groups (p=0.59). After surgery, both groups demonstrated marked improvement in NOSE scores, reflecting better nasal function (p<0.001). Before surgery, FACE-Q scores were lower in the SE group than in the CS group (p=0.003); however, this discrepancy was not observed after the intervention (p=0.487). Improvements in postoperative FACE-Q scores were observed in both groups, as detailed in Table 1 (p<0.001).

Photogrammetric Analysis

Baseline Comparisons

Preoperative anthropometric analysis demonstrated that NL and TP were significantly lower in the SE group compared with the CS group (p<0.001 and p=0.002, respectively), whereas the NLA was comparable between groups (p=0.955). These findings indicate inherent anatomical variation at baseline.

Table 1. Patient demographics, clinical features, NOSE and FACE-Q scores

Parameter	Septal extension	Columellar strut	p
Age	28.43±7.76	27.23±7.12	0.53
Gender (female/male)	22/8	20/10	0.57
Follow-up duration (months)	9.00±2.72	10.00±2.53	0.14
NOSE			
Preoperative	60.17±32.09	64.17±25.66	0.59
Postoperative	21.00±23.35	17.33±23.18	0.54
p	**<0.001**	**<0.001**	
FACE-Q			
Preoperative	34.22±9.86	45.66±17.30	**0.003**
Postoperative	88.27±14.42	85.66±14.24	0.487
p	**<0.001**	**<0.001**	

All scores are given as mean ± SD. Bold values indicate statistical significance. NOSE: Nasal Obstruction Symptom Evaluation Questionnaire, FACE-Q: Facial Aesthetic Quality of Life Questionnaire, SD: Standard deviation

Frontal View

Frontal view photogrammetric measurements are summarized in Table 2. Pre- and post-operative values for upper face height, midface height (MFH), and dorsum width (DW) were significantly lower in the SE group (p<0.05). Lower face height (LFH) and intercanthal width (IW) were similar preoperatively but became lower in the SE group after surgery. Bony base width (BBW) remained similar in both groups. Surgery significantly affected MFH, BBW, DW, and IW in the SE group, and MFH and LFH in the CS group.

Lateral View

Lateral view measurements are presented in Table 3. Nasal frontal angle (NFR), nasofacial angle (NFA), NLA, and nasomental angle showed no significant differences between groups. NL, TP, and columella values were consistently lower in the SE group. Preoperatively, projection and infralobule were lower in the SE group but equalized postoperatively. Surgery significantly affected NFA, NLA, NL, TP, projection, and infralobule in the SE group, and NFA, NLA, NL, TP, and infralobule in the CS group.

Basal View

Basal view parameters are shown in Table 4. No significant differences were found between groups in terms of the lobule/columella breakpoint-alar flare (p=0.932) and columella/lobule ratios (p=0.879). However, the lobule width/basal nasal width ratio was significantly lower in the SE group (p=0.014). Surgery led to significant changes in both ratios in the SE group, while only the lobule width/basal width ratio changed significantly in the CS group (p=0.040).

Nasal Tip Parameters

Changes in nasal TP, rotation, and NL are summarized in Table 5. Changes in nasal TP, rotation, and NL were observed in both groups; however, these changes were not statistically significant.

Discussion

Nasal tip esthetics play a key role in rhinoplasty, influencing both functional and cosmetic outcomes (12). Achieving stable nasal TP and rotation remains a central surgical objective, and several techniques have been developed to support the nasal tip framework (13). Among these, SE and CS grafts are widely used and well-established options. The choice between the two often depends on the surgeon's experience, the patient's anatomy, and the desired degree of tip control.

In contrast to previous studies, the presented study specifically evaluates CS grafts reinforced with Type 1 septocolumellar sutures, directly comparing them with SE grafts using standardized photogrammetric analysis.

In the presented study, SE grafts and CS grafts reinforced with septocolumellar sutures produced comparable esthetic and functional results. Postoperative FACE-Q and NOSE scores did not differ significantly between the two groups, indicating that both grafts can satisfactorily meet patient expectations regarding nasal appearance and breathing. These findings reinforce the value of patient-reported outcomes in evaluating rhinoplasty results.

The mechanical behavior of SE and CS grafts continues to be a subject of discussion. CS grafts are often favored for their flexibility and ability to provide tip support without excessive rigidity or palpability (14-16). In contrast, SE grafts offer firmer and more predictable control over tip position, often described as providing a "stay-where-you-put-it" stability (4,17). Previous studies generally report superior long-term preservation of projection and rotation with SE grafts. Aldosari et al. (18). demonstrated more consistent tip rotation with SE grafts compared to CS grafts, and similar findings were reported by Sadeghi et al. (19) and Akkus et al. (20). Other authors also highlight the long-term stability associated with SE grafts (21-23). Operating room comparisons by Bellamy and Rohrich (24) further support enhanced projection and rotation control with SE grafts. Likewise, Mookerjee et al. (25) showed that although early postoperative decline in projection and rotation may occur, these parameters stabilize and remain steady for up to two years following SE graft placement. Collectively, these recent prospective and quantitative studies further support the improved long-term stability, flexibility, and projection control achieved with SE grafts compared with traditional CS techniques.

Table 2. Photogrammetric analysis results of the frontal views measurements

		Septal extension	Columellar strut	p
Upper facial height	Preoperative	47.22±7.92	53.61±8.86	**0.005**
	Postoperative	47.74±6.82	53.97±7.81	**0.001**
	p	0.681	0.772	
Middle facial height	Preoperative	61.20±8.96	66.98±8.24	**0.015**
	Postoperative	55.8±6.28	61.76±8.21	**0.002**
	p	**<0.001**	**<0.001**	
Lower facial height	Preoperative	51.9±10.17	52.93±11.56	0.669
	Postoperative	51.15±9.50	58.99±7.84	**0.001**
	p	0.708	**<0.001**	
Base bony width (X-X)	Preoperative	26.16±4.79	25.76±4.53	0.741
	Postoperative	24.38±3.97	25.41±4.20	0.332
	p	**0.009**	0.363	
Dorsum width (WD-WD)	Preoperative	7.74±2.14	9.15±2.57	**0.025**
	Postoperative	6.85±1.79	8.70±1.88	**<0.001**
	p	**0.028**	0.299	
Interalar width (AL-AL)	Preoperative	34.15±5.22	35.72±6.15	0.41
	Postoperative	32.56±4.10	34.98±4.32	**0.027**
	p	**0.028**	0.720	

All scores are given as mean ± SD. Bold values indicate statistical significance. X-X: Lower bony vault (left) (X)-lower bony vault (right) (X), WD-WD: Widest point of dorsum (left) (WD)-widest point of dorsum (right) (WD), AL-AL: Alar flare (left) (AL)-alar flare (right) (AL), SD: Standard deviation

Despite the structural advantages of SE grafts, several reports show that CS grafts can also achieve satisfactory tip control, particularly when combined with adjunctive maneuvers such as septocolumellar sutures or tongue-in-groove techniques (26-29). This suggests that the surgical technique may play an important role in optimizing CS graft performance. Recent studies evaluating septocolumellar sutures and tongue-in-groove modifications further suggest that adjunctive stabilization techniques may contribute to improved TP and rotational control in CS-based rhinoplasty (11,12,28,29).

The presented study addresses a specific gap in literature: it demonstrates that CS grafts reinforced with septocolumellar sutures can achieve short-term outcomes comparable to SE grafts, using objective photogrammetric assessment. This provides novel evidence for surgeons considering alternatives to SE grafts in primary rhinoplasty and emphasizes the importance of adjunctive suturing techniques.

Because several baseline anthropometric parameters differed between the groups, these findings require parameter-specific interpretation. While NLA was statistically similar between the SE and CS groups before surgery, baseline NL, TP, projection, and infralobule showed significant intergroup differences. These differences most likely reflect surgeon-driven technique selection based on baseline nasal anatomy rather than intentional allocation of different patient types to the groups. In routine rhinoplasty practice, patients with shorter nasal structures, weaker projection, or reduced tip support are more likely to undergo SE grafting because this technique provides stronger structural control of the nasal tip. Therefore, the lower preoperative values observed in several length- and projection-related parameters in the SE group may be explained by differences in initial nasal morphology.

For NL, the preoperative difference between groups likely reflects the preferential use of SE grafts in patients with shorter nasal structures. Although postoperative improvement was achieved, NL remained numerically lower in the SE group, suggesting that this difference was mainly related to baseline anatomical characteristics rather than insufficient surgical correction. Thus, the persistent postoperative difference in NL should be interpreted as the continuation of pre-existing anatomical variation rather than failure of either technique to lengthen or support the nasal framework.

Similarly, lower preoperative TP and p-values in the SE group may be attributed to weaker baseline tip support and reduced projection. The comparable postoperative improvement between groups suggests that both techniques were effective in improving projection-related parameters, although absolute postoperative values may still have been influenced by the initial anatomical differences.

Table 3. Photogrammetric analysis results of the lateral views measurements

		Septal extension	Columellar strut	p
Nasofrontal angle	Preoperative	149.9±9.71	146.8±8.87	0.208
	Postoperative	149.2±8.45	146.8±8.49	0.316
	p	0.682	0.885	
Nasofacial angle	Preoperative	29.12±4.26	29.42±4.12	0.701
	Postoperative	32.23±5.32	31.84±3.86	0.794
	p	**<0.001**	**<0.001**	
Nasolabial angle	Preoperative	98.86±13.02	98.81±13.45	0.955
	Postoperative	106.2±15.15	107.1±8.83	0.790
	p	**0.007**	**0.002**	
Nasomental angle	Preoperative	131.1±7.12	130.3±6.32	0.591
	Postoperative	129.9±6.55	130.1±5.30	0.914
	p	0.278	0.903	
Nasal length	Preoperative	37.66±5.99	44.01±6.15	**<0.001**
	Postoperative	33.96±5.75	38.97±5.30	**0.001**
	p	**<0.001**	**<0.001**	
Tip projection (goode ratio)	Preoperative	22.77±3.88	27.32±6.75	**0.002**
	Postoperative	27.99±5.16	31.20±4.24	**0.011**
	p	**<0.001**	**0.001**	
Premaxilla (ABJ-Sn)	Preoperative	6.13±1.96	8.79±4.25	**0.003**
	Postoperative	8.68±1.98	9.48±1.80	0.105
	p	**<0.001**	0.372	
Columella length (Sn-C’)	Preoperative	6.95±1.61	8.82±1.99	**<0.001**
	Postoperative	6.94±1.80	8.35±2.25	**0.012**
	p	0.990	0.145	
Infralobule (C’-T)	Preoperative	8.57±2.27	10.26±2.97	**0.022**
	Postoperative	12.30±2.40	13.38±2.39	0.082
	p	**<0.001**	**<0.001**	
Columellar show	Preoperative	5.23±1.66	5.90±1.71	0.180
	Postoperative	5.61±1.68	6.73±1.30	**0.007**
	p	0.316	0.005	

All scores are given as mean ± SD. Bold values indicate statistical significance. ABJ-Sn: Alar base junction (ABJ)-subnasale (Sn), Sn-C’: Subnasale (Sn)-columella breakpoint (C’), C’-T: Columella breakpoint (C’)-tip (T), SD: Standard deviation

Table 4. Photogrammetric analysis results of the basal views measurements

		Septal extension	Columellar strut	p
Lobule/columella breakpoint-alar flare	Preoperative	1.15±0.39	1.14±0.26	0.874
	Postoperative	1.24±0.34	1.23±0.35	0.932
	p	0.291	0.198	
Lobule width/basal nasal width	Preoperative	0.74±0.05	0.78±0.08	**0.014**
	Postoperative	0.68±0.05	0.72±0.08	**0.04**
	p	**<0.001**	**0.008**	
Columella/lobule ratio	Preoperative	0.93 (0.5-2.27)	0.81±0.26	0.092
	Postoperative	0.79±0.18	0.80±0.20	0.879
	p	**0.028**	0.819	

Data are presented as mean ± standard deviation or median (interquartile range, 25th-75th percentiles), as appropriate. Bold values indicate statistical significance

Table 5. Comparison of changes in tip projection, tip rotation, and nasal length values before and after surgery

Preop-postop change	Septal extension	Columellar strut	p
Tip projection	5.21±4.26	3.88±5.83	0.318
Tip rotation; NLA	7.42±13.99	8.34±13.12	0.796
Nasal length	3.69±3.56	4.98±3.15	0.143

NLA: Nasolabial angle

Interestingly, infralobule, which differed significantly before surgery, became statistically comparable after surgery. This finding suggests postoperative normalization of the infratip-tip contour relationship. In particular, the use of septocolumellar sutures in the CS group may have enhanced rotation and projection control sufficiently to compensate for the structural rigidity advantage traditionally associated with SE grafts. This may explain why a parameter that was initially different between groups became statistically similar after surgery.

Overall, these findings indicate that the observed intergroup differences should not be interpreted solely based on absolute postoperative values. Instead, baseline nasal morphology, surgeon-driven graft selection, and the magnitude of surgical change within each group should be considered together when evaluating the comparative effects of SE and CS grafting techniques.

Our photogrammetric analysis further supports the clinical equivalence of the two graft types. Although postoperative NL and TP values were slightly lower in the SE group, these postoperative differences should be interpreted in light of the lower baseline values in the SE group. Both groups exhibited significant postoperative improvement in NL, TP, and NLA. The finding that CS grafts combined with a septocolumellar suture achieved outcomes similar to SE grafts suggests that the adjunctive suture may compensate for the increased structural rigidity provided by SE grafts.

Another notable observation is the ability of CS grafts to maintain projection while creating a defined infratip break, provided that appropriate suturing techniques are applied. This highlights the critical role of surgical execution, possibly as important as graft selection itself. More recently, Amador et al. (30) conducted a systematic review comparing SE and CS grafts and emphasized that both techniques remain valuable options in rhinoplasty, with graft selection needing to be individualized according to patient anatomy, desired tip characteristics, and surgical goals.

Study Limitations

This study has several limitations. The sample size was modest and derived from a single-center, which may limit generalizability. Additionally, patients were not stratified based on skin thickness, a known factor affecting tip support and postoperative stability. The mean follow-up period was 9-12 months, which allowed assessment of early and mid-term outcomes; however, it may not fully capture long-term nasal tip stability, particularly for SE grafts. Therefore, longer-term prospective studies with follow-up periods exceeding one year are warranted to better evaluate the durability and stability of surgical outcomes. Furthermore, the retrospective design, lack of randomization, baseline anatomical differences between groups, and potential surgeon-selection bias should be considered when interpreting the results. Nonetheless, the use of standardized three-dimensional photogrammetric measurements represents a major strength, enabling objective and reproducible analysis of nasal morphology.

Conclusion

Both SE grafts and CS grafts reinforced with septocolumellar sutures demonstrated comparable functional and esthetic outcomes, with no significant differences in postoperative FACE-Q scores, NOSE scores, NL, TP, or NLA. Although patients in the SE group began with lower baseline values, postoperative results were equivalent between the two groups; however, it should be interpreted with caution given the baseline differences and the adjunctive septocolumellar sutures used in the CS group.

The use of a septocolumellar suture in the CS technique appears to offset the structural advantages traditionally attributed to SE grafts, indicating that CS grafts, when reinforced with appropriate suturing, can serve as an equally effective alternative for tip support and control. It is important to note that the comparison is not purely between SE and CS grafts alone, but between SE grafts and CS grafts combined with septocolumellar sutures, which should be considered when interpreting the findings.

Ethics

Ethics Committee Approval: Prior to initiation of the study, the research design and data collection procedures were reviewed and authorized by the Non-Interventional Ethics Committee of Kırıkkale University (approval no: 2024.11.02, date: 14.11.2024).

Informed Consent: Participation was voluntary, and written consent was obtained from all enrolled individuals.

Footnotes

Authorship Contributions

Surgical and Medical Practices: S.K., B.M.T., Z.Ş., Concept: S.K., L.N.C., N.B.M., B.M.T., Z.Ş., E.C., Design: S.K., L.N.C., N.B.M., B.M.T., Z.Ş., E.C., Data Collection and/or Processing:

S.K., L.N.C., B.M.T., Z.Ş., Analysis or Interpretation: S.K., L.N.C., B.M.T., Z.Ş., Literature Search: S.K., L.N.C., N.B.M., E.C., Writing: S.K., L.N.C., N.B.M., E.C.

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Main Points

- Both surgical techniques achieved comparable improvements in nasal tip projection, rotation, nasal length, and patient-reported functional and esthetic outcomes.
- Reinforcement of the columellar strut graft with a septocolumellar suture provided postoperative results comparable to those achieved with a septal extension graft.
- Septocolumellar suture reinforcement may represent a reliable alternative to septal extension grafting for achieving stable nasal tip support in primary rhinoplasty.

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