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RESEARCH

Patient-reported outcomes after nasal reconstruction: FACE-Q assessment across techniques from skin grafts to complex reconstructions

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Abstract

Background Nasal reconstruction after skin cancer excision represents one of the most demanding tasks in reconstructive surgery, aiming to restore function and aesthetics simultaneously. Although surgical techniques continue to evolve, limited data exist comparing patient-reported outcomes across different reconstructive approaches. This study used the FACE-Q Skin Cancer questionnaire, a validated patient-reported outcome measure (PROM), to assess satisfaction and psychosocial well-being among patients undergoing various nasal reconstructions.

Methods A retrospective single-center study was performed including patients who underwent nasal reconstruction after excision of melanoma and non-melanoma skin cancers between 2019 and 2022. Patient-reported outcomes were assessed using the FACE-Q Skin Cancer module administered at least one year postoperatively. Of 189 patients contacted, 120 met the inclusion criteria and were stratified according to the reconstructive technique into six groups: paramedian forehead flap, nasolabial flap, bilobed flap, Rieger/Marchac flap, frontoglabellar flap, and skin graft. Differences in FACE-Q scores among groups were analyzed using one-way ANOVA.

Results All techniques yielded high satisfaction levels regarding scar appraisal, facial appearance, and quality-of-life domains. A statistically significant difference was observed for "Cancer Worry" ($p = 0.008$), with skin graft patients showing higher anxiety concerning recurrence.

Conclusions All reconstructive techniques provided satisfactory aesthetic and psychosocial outcomes. However, patients reconstructed with skin grafts reported higher cancer-related worry, possibly due to the patch-like appearance which may act as a visual reminder of the previous lesion. These findings highlight the importance of careful reconstructive planning and preoperative counselling. The use of PROMs such as FACE-Q enables a more comprehensive, patient-centered evaluation of nasal reconstruction outcomes.

Level of evidence: Not gradable.

Keywords Nasal reconstruction · Skin cancer · FACE-Q · Patient-reported outcomes · Skin grafts · Reconstructive flaps

Introduction

Nasal reconstruction is a cornerstone of plastic surgery, essential for restoring both functional and aesthetic integrity after trauma, oncologic resection, or congenital anomalies. Aesthetic goals of nasal reconstruction include symmetry, natural contour, and optimal skin-color match [1–6]. Despite continuous advancements in technique, the effect of these procedures on patients' quality of life (QoL) remains underexplored [7–9].

The FACE-Q | Skin Cancer questionnaire is a validated PROM specifically designed to evaluate the experiences of patients undergoing surgery for facial skin cancers[10–13].

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It encompasses multiple domains, including appearance satisfaction, cancer worry, and experience of care. Previous research has typically focused on individual techniques or selected questionnaire domains [7–9]. Evidence shows that patients who undergo primary closures after tumor excision often report lower satisfaction than those undergoing reconstructive flaps [1–6]. This difference underscores the psychological value of aesthetic harmony, especially in central facial areas such as the nose [2–6].

The FACE-Q has been validated cross-culturally and is increasingly applied to compare outcomes following diverse reconstructive procedures [10–14]

In this study, the full FACE-Q Skin Cancer instrument was administered to patients who underwent six distinct reconstruction techniques—paramedian forehead flap, nasolabial flap, bilobed flap, Rieger/Marchac flap [15, 16], frontoglabellar flap, and skin graft—to evaluate patient satisfaction and psychological outcomes associated with each approach.

Methods

Study design and population

This retrospective, single-center therapeutic study (Level III) included patients undergoing nasal reconstruction after melanoma or non-melanoma skin cancer excision (2019–2022). Inclusion required completion of the FACE-Q

Fig. 1 FACE-Q skin cancer questionnaire domains with example items and scoring. Higher scores indicate better outcomes, except for distress and cancer worry, where lower scores reflect less concern

FACE-Q	Items	Example	Response	Score Ranging
Cancer Worry (CW)	10	I worry about my skin cancer	Strongly disagree = 1 Strongly agree = 4	0 - 100
Appearance related distress (ARD)	8	I feel insecure about how my face looks	Definitely disagree = 1 Definitely agree = 4	0 - 100
Appraisal of scars (AOS)	8	How much have you been bothered by the color of your scar(s)?	Extremely bothered = 1 Not at all bothered = 4	0 - 100
Satisfaction with facial appearance (SWFA)	9	How satisfied or dissatisfied have you been with: the shape of your face?	Very dissatisfied = 1 Very satisfied = 4	0 - 100
Satisfaction with information appearance (SWIA)	6	How satisfied or dissatisfied were you with the information you received in relation to how your appearance would change?	Very dissatisfied = 1 Very satisfied = 4	0 - 100
Adverse effect checklist (AEC)	10	How much have you been bothered by the pain?	Not at all = 1 Extremely = 4	10 - 40

Descrittive

		N	Medio	Deviazione std.	Errore std.	95% di intervallo di confidenza per la media		Minimo	Massimo
						Limite inferiore	Limite superiore		
CANCER WORRY EQUIVALENT RASCH TRANSFORMED SCORE (0-100)	1	14	33,21	17,290	4,621	23,23	43,20	0	65
	2	29	36,72	25,411	4,719	27,06	46,39	0	65
	3	15	22,40	27,979	7,224	6,91	37,89	0	72
	4	36	25,25	28,925	4,821	15,46	35,04	0	100
	5	12	31,08	37,398	10,796	7,32	54,85	0	100
	6	14	58,00	31,459	8,408	39,84	76,16	0	100
	Totale	120	33,00	29,492	2,692	27,67	38,33	0	100
APPEARANCE RELATED DISTRESS EQUIVALENT RASCH TRANSFORMED SCORE (0-100)	1	14	18,86	23,438	6,264	5,32	32,39	0	62
	2	29	22,48	28,611	5,313	11,60	33,37	0	100
	3	15	18,87	35,986	9,292	-1,06	38,79	0	100
	4	36	12,22	19,091	3,182	5,76	18,68	0	62
	5	12	14,75	27,493	7,936	-2,72	32,22	0	72
	6	14	7,43	19,286	5,154	-3,71	18,56	0	62
	Totale	120	16,00	25,457	2,324	11,40	20,60	0	100
APPRAISAL OF SCARS EQUIVALENT RASCH TRANSFORMED SCORE (0-100)	1	14	69,71	32,150	8,592	51,15	88,28	0	100
	2	29	80,21	40,009	7,430	64,99	95,43	0	200
	3	15	87,67	28,500	7,359	71,88	103,45	0	100
	4	36	83,97	21,414	3,569	76,73	91,22	36	100
	5	12	79,92	30,891	8,918	60,29	99,54	0	100
	6	14	91,36	26,883	7,185	75,84	106,88	0	100
	Totale	120	82,32	30,357	2,771	76,83	87,80	0	200
SATISFACTION WITH FACIAL APPEARANCE EQUIVALENT RASCH TRANSFORMED SCORE (0-100)	1	14	76,93	21,791	5,824	64,35	89,51	45	100
	2	29	75,00	28,974	5,380	63,98	86,02	0	100
	3	15	71,53	27,795	7,177	56,14	86,93	0	100
	4	36	84,00	20,595	3,433	77,03	90,97	38	100
	5	12	78,67	24,276	7,008	63,24	94,09	38	100
	6	14	87,21	21,694	5,798	74,69	99,74	38	100
	Totale	120	79,28	24,450	2,232	74,86	83,70	0	100
SATISFACTION WITH INFORMATION APPEARANCE EQUIVALENT RASCH TRANSFORMED SCORE (0-100)	1	14	75,00	22,402	5,987	62,07	87,93	37	100
	2	29	71,86	29,563	5,490	60,62	83,11	0	100
	3	15	70,73	27,293	7,047	55,62	85,85	0	100
	4	36	85,22	19,538	3,256	78,61	91,83	37	100
	5	12	79,42	24,036	6,939	64,15	94,69	37	100
	6	14	79,93	22,210	5,936	67,10	92,75	37	100
	Totale	120	77,79	24,514	2,238	73,36	82,22	0	100
ADVERSE EFFECT CHECKLIST (10 - 40)	1	14	13,43	4,831	1,291	10,64	16,22	10	26
	2	29	12,24	3,147	,584	11,04	13,44	10	21
	3	15	11,53	4,068	1,050	9,28	13,79	10	26
	4	36	12,42	5,245	,874	10,64	14,19	10	36
	5	12	12,50	2,680	,774	10,80	14,20	10	19
	6	14	10,64	1,216	,325	9,94	11,34	10	14
	Totale	120	12,18	4,036	,368	11,45	12,91	10	36
Età	1	14	77,43	6,548	1,750	73,65	81,21	61	87
	2	29	75,69	9,320	1,731	72,14	79,23	51	91
	3	15	72,60	11,488	2,966	66,24	78,96	55	90
	4	36	76,42	10,095	1,682	73,00	79,83	54	96
	5	12	77,33	9,727	2,808	71,15	83,51	52	88
	6	14	77,57	7,861	2,101	73,03	82,11	58	89
	Totale	120	76,11	9,399	,858	74,41	77,81	51	96

Fig. 2 Statistical parameters for the six questionnaire parts within each of the six patient groups

questionnaire ≥ 1 year postoperatively; incomplete or lost-to-follow-up cases were excluded.

Among 189 contacted patients, 120 completed the questionnaire. Each was categorized based on the surgical technique: paramedian forehead flap ($n=14$), nasolabial flap ($n=29$), bilobed flap ($n=15$), Rieger/Marchac flap ($n=36$), frontoglabellar flap ($n=12$), and skin graft ($n=14$).

Surgical technique selection was based on predefined criteria, including defect location, size, complexity and skin characteristics. Specifically, the paramedian forehead flap was preferred for large defects involving the nasal tip or lesions > 2.5 cm affecting any aesthetic subunit. The nasolabial flap was used for simple or complex defects of the ala and sidewall. The bilobed flap was indicated for small, localized defects up to 1.5 cm. Rieger and Marchac flaps were considered suitable for dorsal or tip defects up to 2.5 cm. The frontoglabellar flap was employed for reconstruction of the nasal dorsum and sidewall at the level of the rhinion or nasion. Full-thickness skin grafts were reserved for dorsal defects or extensive but simple lesions without cartilage involvement, particularly in frail patients.

FACE-Q questionnaire

The FACE-Q, based on Rasch Measurement Theory [10, 11], evaluates unidimensional constructs across domains including Facial Appearance (appraisal of scars and satisfaction with general facial appearance), Quality of Life (appearance-related distress and cancer worry) and Experience of Care (satisfaction with information provided),

plus two checklist domains (sun protection and adverse effects). Scales were standardized to 0–100 (higher = better outcomes, except for distress, cancer worry, and adverse-effect checklists) (Fig. 1).

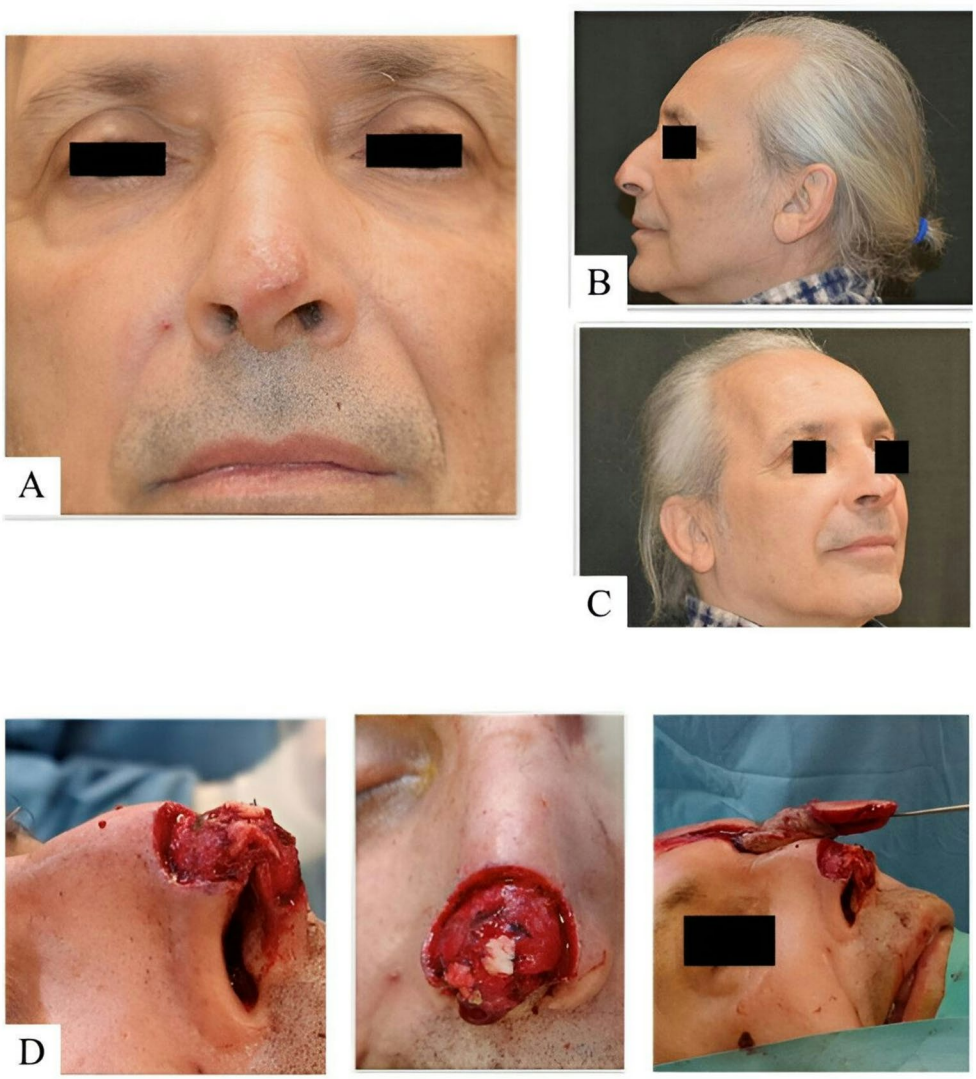


Fig. 3 **A**, **B**, **C**: Patient with sclerodermiform basal cell carcinoma localized on the tip of the nose. **D**: Complex reconstruction: internal lining with bipedunculated flaps and donor area grafting, framework reconstruction with cartilage grafts harvested from the auricolar bowl, cutaneous reconstruction with left paramedian forehead flap

Statistical analysis

Statistical analysis using one-way ANOVA assessed intergroup differences across FACE-Q domains. Significance was set at $p<0.05$. Analyses were performed using standard statistical software (SPSS Statistics). (Fig. 2)

Results

Favorable results were observed across all reconstruction techniques for scar appraisal, satisfaction, and low distress (Figs. 3 and 4).

Cancer Worry scores differed significantly among groups ($p=0.008$), with the highest mean observed in the skin graft group (58.0) compared to forehead flap (33.2), nasolabial flap (36.7), bilobed flap (22.4), Rieger/Marchac flap (25.3), and frontoglabellar flap (31.1).

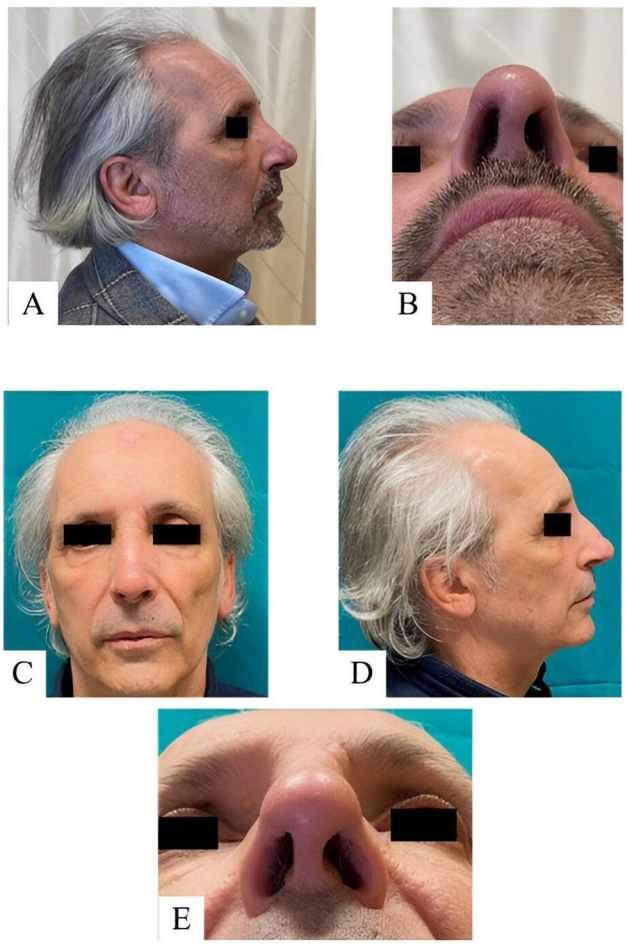


Fig. 4 **A**, **B**: Patient at 1 month post operative. **C**, **D**, **E**: Patient at 9 months post operative

Appearance-related distress was generally low across all techniques, with no statistically significant differences ($p=0.465$).

Appraisal of scars was high overall (69.7–91.4), with bilobed and skin-graft groups achieving the best scores ($p=0.494$).

Satisfaction with facial appearance and information provided was consistently high, without significant intergroup differences ($p=0.254$–0.379).

Similarly, adverse-effect checklist scores were low across all groups ($p=0.562$), and no significant variation in mean patient age was detected ($p=0.707$).

Discussion

Nasal reconstruction plays a fundamental role in restoring identity and self-perception after oncologic surgery [1–6]. Although surgical outcomes may be objectively satisfactory, patient-reported experiences provide critical insight into the psychological and emotional impact of reconstruction.

In our study, the FACE-Q Skin Cancer module effectively captured these patient-centered dimensions. The significantly higher scores observed in the Cancer Worry domain among patients reconstructed with skin grafts are consistent with findings from previous psychosocial investigations [1, 5, 6, 8, 9]. One possible explanation is that graft reconstruction, which does not replace the defect with adjacent similar tissue, may create a patch-like appearance that patients perceive as less "reconstructive" than local flaps. This visual difference may act as a persistent reminder of the previous lesion, potentially contributing to increased concern about recurrence or aesthetic outcome.

While previous studies using the FACE-Q Skin Cancer questionnaire have primarily evaluated individual reconstructive techniques [7–9], this broader comparison across six reconstructive methods demonstrated consistently high levels of satisfaction and low complication rates [1–6]. These findings further support the reliability and effectiveness of local and locoregional flaps as established reconstructive options in nasal reconstruction.

This study has several limitations, including its retrospective design, the single-center setting, the relatively limited sample size, and the absence of preoperative FACE-Q measurements, which may limit the ability to fully assess changes over time. Additionally, differences in defect characteristics and reconstructive indications among techniques may represent potential confounders.

Nevertheless, incorporating patient-reported outcome measures into postoperative evaluation provides a more comprehensive understanding of reconstructive success. The FACE-Q PROM framework has demonstrated strong

psychometric properties and cross-cultural validity [10–14], supporting its role as a valuable tool for longitudinal patient monitoring and quality-improvement initiatives. From a clinical perspective, these findings highlight the importance of integrating patient perceptions into reconstructive decision-making and underscore the need for thorough preoperative counseling, particularly when skin grafting is considered.

Conclusions

Nasal reconstruction following skin cancer excision achieves high levels of patient satisfaction across different reconstructive techniques. However, patients treated with skin grafts reported significantly higher levels of cancer-related worry, possibly related to the patch-like appearance which may act as a visual reminder of the previous lesion. These findings highlight the importance of considering patient perceptions during reconstructive planning and of providing thorough preoperative counselling. Incorporating patient-reported outcome measures such as the FACE-Q offers a valuable patient-centered perspective for evaluating reconstructive success and guiding clinical decision-making.

Author contributions L. Brambilla: Supervision, Methodology, Writing – review & editing.A. Lauria: Conceptualization, Data curation, Formal analysis, Writing – original draft.All authors reviewed the manuscript.

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Data availability The datasets generated and analyzed during the current study are not publicly available due to patient privacy and confidentiality agreements.

Declarations

Ethical approval According to local institutional policies for retrospective studies using fully anonymized data, formal approval by an Ethics Committee was not required. The study was conducted in accordance with the ethical standards of the institutional and national research committee and with the Declaration of Helsinki.

Consent to participate All participants voluntarily completed the questionnaire and consented to the use of their anonymized data and images for research purposes.

Human ethics and consent to participate Not applicable.

Clinical trial number Not applicable.

Competing interests The authors declare no competing interests.

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