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Published in:
International Journal of Oral and Maxillofacial Surgery

DOI:
[10.1016/j.ijom.2022.02.007](https://doi.org/10.1016/j.ijom.2022.02.007)

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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2022

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Hollander, M. H. J., Delli, K., Vissink, A., Schepers, R. H., & Jansma, J. (2022). Patient-reported aesthetic outcomes of upper blepharoplasty: a randomized controlled trial comparing two surgical techniques. *International Journal of Oral and Maxillofacial Surgery*, 51(9), 1161-1169. <https://doi.org/10.1016/j.ijom.2022.02.007>

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Randomised Controlled Trial Cosmetic Surgery

Patient-reported aesthetic outcomes of upper blepharoplasty: a randomized controlled trial comparing two surgical techniques

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M. H. J. Hollander, K. Delli, A. Vissink, R. H. Schepers, J. Jansma: Patient-reported aesthetic outcomes of upper blepharoplasty: a randomized controlled trial comparing two surgical techniques. Int. J. Oral Maxillofac. Surg. 2022; 51: 1161–1169. © 2022 The Author(s). Published by Elsevier Inc. on behalf of International Association of Oral and Maxillofacial Surgeons. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Abstract. It is not yet established whether additional orbicularis oculi muscle excision leads to better patient-reported aesthetic outcomes (PRO) compared to a skin-only resection blepharoplasty. A double-blind randomized controlled trial of upper blepharoplasty, with or without muscle excision, was performed on 54 White European patients who assessed the procedure via PRO. FACE-Q questionnaires covering eyes in general, upper eyelids, forehead and eyebrows, overall face, age appearance appraisal, age appraisal, social functioning, satisfaction with the outcome, and adverse effects were completed preoperatively and at 6 and 12 months after upper blepharoplasty. The Patient and Observer Scar Assessment Scale was used to assess scarring. The FACE-Q scores for skin-only and skin/muscle upper blepharoplasty were similar regarding the upper eyelids, forehead and eyebrows, overall face, patient perceived aging and age, social functioning, and satisfaction with the results, and also increased for both procedures with time. The FACE-Q score regarding the eyes in general was higher in the skin-only group at the 12-month follow-up. Scarring and adverse effects did not differ between the groups. Additional muscle resection does not seem to influence patient satisfaction. Thus, when performing an upper blepharoplasty, there is no need for additional muscle resection as a routine procedure to improve patient satisfaction.

Key words: blepharoplasty; eyelid correction; patient satisfaction; patient reported outcome measures; esthetics; FACE-Q; scar.

Accepted for publication 14 February 2022
Available online 23 February 2022

Dermatochalasis is a major cause of aesthetic dissatisfaction with the peri-orbital area and an important reason for patients

to undergo an upper blepharoplasty. In the past, surgeons were inclined to perform a more invasive blepharoplasty with the

removal of excess skin together with a strip of orbicularis oculi muscle, sometimes combined with the excision or

redistribution of fat from the medial and central fat compartments. Nowadays, surgeons tend to be more conservative by sparing the orbicularis oculi muscle and orbital fat, because this might preserve the fullness of the upper eyelid region, thus preventing an aged hollow orbit appearance¹⁻⁴. Whether the latter effect is also noticed by patients and regarded as a less appealing aesthetic outcome after blepharoplasty is currently unknown.

Many upper blepharoplasty studies have based their aesthetic outcome conclusions mainly on expert evaluations and technical aspects^{5,6}. Infrequently, the treatment outcomes have been based on patient-reported outcomes assessed using validated questionnaires^{3,7,8}. Also, the details of the surgical technique used have often not been reported^{6,9}.

Although an upper blepharoplasty is a common cosmetic surgical intervention, it is still unknown which surgical technique is preferred by patients for the best aesthetic results. The aim of this randomized controlled trial was to assess the patient-reported outcomes (PROs) of two different surgical upper blepharoplasty techniques.

Methods

Study population

All consecutive healthy White European patients between the ages of 30 and 70 years, who consulted the Department of Oral and Maxillofacial Surgery at the University Medical Center Groningen for an upper blepharoplasty between February 2018 and October 2019, were invited to participate. Patients were included if they showed dermatochalasis of both upper eyelids and an upper eyelid blepharoplasty was indicated. Consultations were performed by two maxillofacial surgeons (J.J., R.H.S.) with extensive experience in upper blepharoplasties. The patients had to be fluent in Dutch in order to understand the Dutch questionnaires fully. Patients were excluded if they suffered from severe hollowing of the upper eyelid area (including A-frame deformity), had a history of ocular or orbital trauma, a history of eyelid or eyebrow region surgery, had been subjected to other cosmetic surgical or non-surgical procedures, had ophthalmic disease, or suffered from blepharoptosis.

Study design

A prospective, single-centre, double-blind randomized controlled trial investigating PROs of upper blepharoplasties was

designed. The study protocol was approved by the Institutional Review Board of the University Medical Center Groningen (METc2017/451) and registered in the Netherlands Trial Register (ID NL7886). Written informed consent was obtained from all study participants. The 2010 CONSORT statement was applied in the reporting of this study.

Blinding and randomization (Fig. 1)

Eligible participants were assigned randomly to either treatment group A (resection of skin only) or group B (resection of skin and a strip of underlying orbicularis oculi muscle). Block randomization (blocks of four) was used by an independent investigator (M.H.J.H.) according to the list created prior to the start of the study by a randomization computer tool (Sealed Envelope, 2017; Sealed Envelope Ltd, London, UK). Participants received a unique code in consecutive order, i.e. the first included participant received the first code on the list. The investigators and participants were blinded to the group allocation. Only the surgeons knew which treatment group the patient had been assigned to until the completion of the trial. Participants were informed about both surgical procedures, but did not know which treatment they had undergone, and received identical information about the postoperative course of events.

Outcomes

Demographic data were recorded including age, sex, medical history, and use of medication. The severity of the dermatochalasis was assessed before upper blepharoplasty and categorized according to a four-level photo-numerical severity scale using anatomical cut-off points: normal if the upper eyelid skin was not touching the eyelashes, mild if the upper eyelid skin was touching the eyelashes, moderate if the upper eyelid skin was hanging over the eyelashes, and severe if the upper eyelid skin was hanging over the eye¹⁰. The tissue removed was weighed per eye and the weight recorded in grams.

PROs were obtained at baseline and at 6 and 12 months after the surgical upper blepharoplasty by means of validated FACE-Q questionnaires¹¹⁻¹⁴. The questions refer to the eyes in general, but also to the upper eyelids, forehead and eyebrows, overall face, age appearance appraisal, age appraisal, social functioning, and satisfaction with the outcome. Scale scores range from 0 (worst) to 100 (best), except for the age appraisal scale.

The latter scale score ranges from -15 (best) to +15 (worst). Additionally, a checklist measuring post-blepharoplasty adverse effects was completed.

Scarring was assessed at 12 months after surgery with the Patient and Observer Scar Assessment Scale (POSAS, version 2.0/NL)¹⁵. The POSAS was developed and validated to capture the patient's perceptions of a discrete scar site and consists of two separate domains: a patient domain and an observer domain¹⁴. The patient scale consists of seven questions, six of which are completed by the patient to rate specific characteristics of their scar (pain, itch, colour, stiffness, thickness, regularity). The seventh question rates their overall opinion of the scar site. The observer also rates six scar aspects (vascularity, pigmentation, pliability, thickness, relief, and surface area (i.e., contraction/expansion)) and calculates a total score. Additionally, the seventh question rates the observer's overall opinion of the scar site. All questions are answered on a Likert scale from 1 to 10, with 1 being no difference between the scar and non-injured skin, and 10 representing the most difference. The total score of both scales is the sum of the scores of each of the six POSAS items (range: 6 (normal skin) to 60 (worst scar imaginable)).

Surgical procedure

The upper blepharoplasties were performed by two surgeons (J.J., R.H.S.). The surgical procedure was standardized prior to the study and took place in an outpatient setting, and at random. The performance of the upper blepharoplasties was divided equally between the two surgeons. The procedures in the two groups were completed as outlined below.

Preoperatively, with the patient in an upright position, the surgeon used a marking pen to draw the incision lines on the skin of the eyelids. The lid crease incision was marked first, by generally following the eyelid crease of the upper eyelid. A pinch technique was used to assess the maximum amount of skin to be removed. The patients were asked to close their eyelids gently. A pair of smooth forceps was used to grasp the excess skin above the eyelid crease incision until the eyelashes began to rotate upwards. This was considered to be the maximum amount of skin that could be removed safely. The surgical markings were made within these boundaries (Fig. 2a). Approximately 1.7 ml of Ultracaine DS Forte (40 mg articaine, 10 µg epinephrine per millilitre)

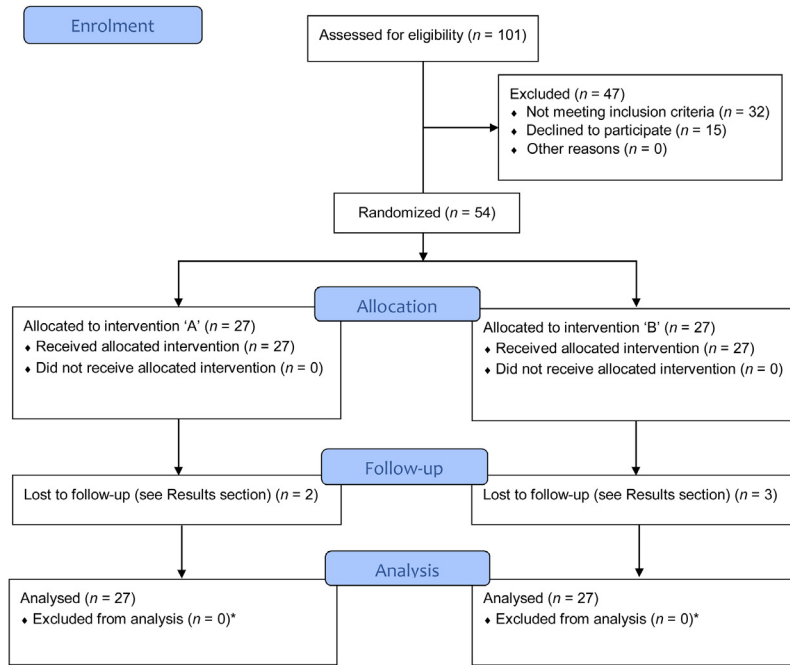


Fig. 1. Flowchart of participant enrolment.

*Only the lost-to-follow-up values were excluded from the analysis.

local anaesthetic was injected subcutaneously per eye.

After incising the skin with a scalpel, the excess skin was removed (Fig. 2b). Cauterization was used to achieve haemostasis. The group B participants then underwent subsequent removal of an additional strip of the underlying orbicularis oculi muscle (Fig. 2c, d). The tissue removed was weighed per eye. The orbital septum was coagulated in order to create scarring and thereby to accentuate the eyelid crease better³ (Fig. 2e). The muscle edges were approximated with two to three small bipolar coagulation spots (Fig. 2f). The skin was sutured with Ethilon 6-0 (Ethicon, Cornelia, GA, USA) intracutaneously in a running fashion (Fig. 2g) and adhesive suture strips were placed. Photographs of the surgical technique are shown in Fig. 3a-d.

The participants were asked to avoid heavy lifting, sudden bending, and strenuous sporting activities for 7 days following the procedure. The patients were seen 7 days postoperatively to remove the

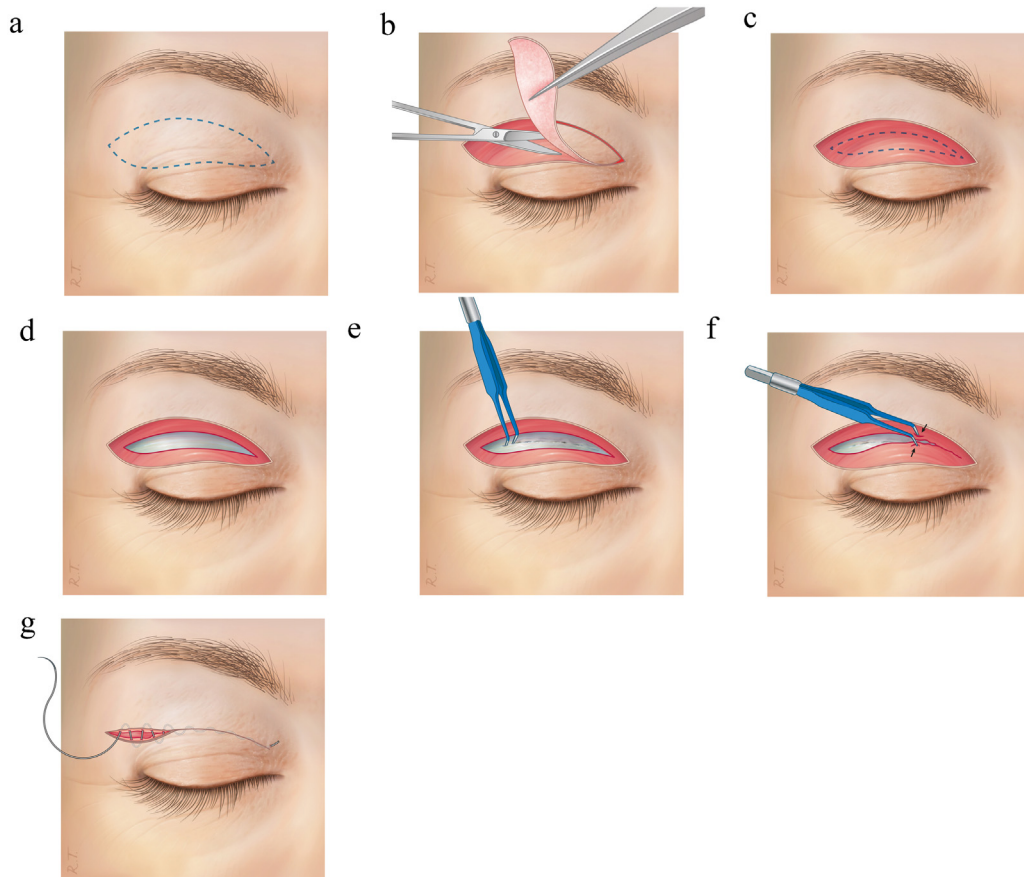


Fig. 2. (A) Shape of the surgical markings and skin excision. (B) Removal of excess skin. (C) Shape and amount of orbicularis oculi muscle removed (only in treatment group B). (D) A strip of 2–3 mm of orbicularis oculi muscle is removed (only in treatment group B). It is smaller than the initial strip of removed skin. (E) Coagulation of the orbital septum (only in treatment group B). (F) Approximation of the muscle edges with bipolar coagulation on two to three small spots (only in treatment group B). (G) Intracutaneous sutures running from the medial to the lateral side.

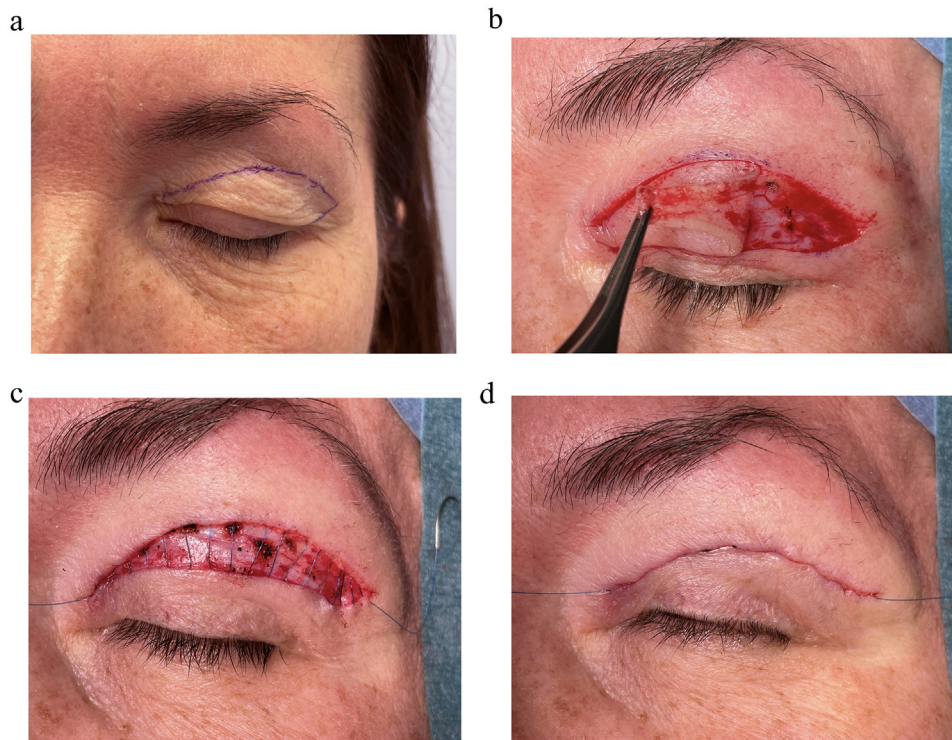


Fig. 3. (A) Shape of the surgical markings and skin excision. (B) Removal of excess skin. (C) Placement of intracutaneous sutures running from the medial to the lateral side. (D) Skin approximation after intracutaneous suturing.

suture strips and sutures, and after 2, 6, and 12 months to be examined and evaluated for potential complications.

When indicated, i.e. when a significant amount of protruding medial fat was present, the patients underwent removal of the protruding medial fat whereby the orbital septum was only opened medially to expose the fat. Pressing the globe gently made the fat protrude through the open septum. The capsules were opened and the pads were trimmed with bipolar coagulation to create the desired contour of the eyelid. All other treatment procedure steps were identical in groups A and B.

Statistical analysis

Twenty-seven patients were needed per treatment group to detect a difference of 7.0 in FACE-Q score (based on minimally important differences derived from results in the literature¹⁶) between group A and group B at 6 and 12 months, with a two-sided 5% significance level and a power of 90%, allowing for a 10% attrition rate and 10% for possible non-parametric testing (G*Power version 3.1.9.6, University of Kiel, Germany). Data were analysed using IBM SPSS Statistics version 23.0 (IBM Corp., Armonk, NY, USA). The Shapiro–Wilk test, Kolmogorov–Smirnov test, and graphical interpretation of normal Q–Q

plots were used to determine the distribution of the data.

The independent samples *t*-test was used to assess differences in age and amount of tissue removed between the groups at baseline. Similarly, the χ^2 test of homogeneity was used to evaluate differences in sex, dermatochalasis severity score, and medial fat removal between the groups at baseline.

FACE-Q score differences between group A and group B were evaluated using generalized estimating equations (GEE). The GEE model included FACE-Q scores, baseline FACE-Q scores, sex, age, dermatochalasis severity score, and tissue removed during surgery. *P*-values <0.05 were considered statistically significant. Missing data were not imputed. Baseline FACE-Q ‘Satisfaction with the result’ scores were not part of the GEE model because there is no baseline ‘Satisfaction with the result’ present before surgery. All residuals showed a Gaussian distribution. Different correlation structures (exchangeable, M-dependent, unstructured) were tested and the model with the lowest information criterion was used, which was the exchangeable correlation structure for all variables.

Pre- and post-blepharoplasty differences were analysed using the Friedman test and pairwise comparisons were performed. The Wilcoxon signed rank test

was used to evaluate possible differences between the 6- and 12-month postoperative FACE-Q ‘Satisfaction with the results’ questionnaires.

POSAS scores showed a non-normal distribution, and differences between group A and group B were analysed using the Mann–Whitney *U*-test.

Fisher’s exact test was used (>20% of the expected cell counts being <5) to evaluate the differences in the adverse effects (FACE-Q) scores between group A and group B.

Results

The characteristics of the patients included in groups A and B, depicted in Table 1, were comparable at baseline. Five female patients were excluded: two patients in group B were lost to the 2-month and 12-month follow-ups, two patients in group A were excluded after the 6-month follow-up visit due to burn-out and to multiple health problems related to dysregulated diabetes mellitus, and one patient in group B was excluded from the 12-month analysis because of her wish to correct the scarred tissue of one eyelid shortly after the initial procedure. In the latter patient, the sutures came loose, which resulted in a widened scar that was corrected after the 6-month follow--

Table 1. Patient characteristics after randomization.

	Total (n = 54)		Group A (n = 27)		Group B (n = 27)		P-value
Sex, n (%)	Female: 44 (82%) Male: 10 (18%)		Female: 21 (78%) Male: 6 (22%)		Female: 23 (85%) Male: 4 (15%)		0.484
Age (years) ^a	57 ± 8.9 (39–70)		58 ± 8.6 (43–70)		55 ± 9.1 (39–70)		0.241
Dermatochalasis severity score (number of patients)	Right eye	Left eye	Right eye	Left eye	Right eye	Left eye	R: 0.771 L: 0.523
	Normal: 0	Normal: 0	Normal: 0	Normal: 0	Normal: 0	Normal: 0	
	Mild: 23	Mild: 23	Mild: 11	Mild: 10	Mild: 12	Mild: 13	
	Moderate: 28	Moderate: 28	Moderate: 15	Moderate: 16	Moderate: 13	Moderate: 12	
	Severe: 3	Severe: 3	Severe: 1	Severe: 1	Severe: 2	Severe: 2	
Removed skin (g) ^a	0.31 ± 0.09 (0.18–0.61)		0.30 ± 0.08 (0.18–0.42)		0.32 ± 0.11 (0.18–0.61)		R: 0.563 L: 0.703
Removed muscle (g) ^a	-	-	-	-	0.11 ± 0.07 (0.05–0.40)	0.11 ± 0.07 (0.05–0.40)	-
Medial fat removal (number of patients)	2		2 ^b		0		0.552

Group A: resection of skin only. Group B: resection of skin and a strip of underlying orbicularis oculi muscle.

^aMean ± standard deviation (range) values.

^bRemoval of medial fat from both eyes.

up visit. The procedures were divided equally and the outcomes did not differ between the surgeons. Figures 4 and 5 show example results for both procedures.

Pre- and postoperative FACE-Q scores (Fig. 6)

In both groups, postoperative FACE-Q scores improved compared to baseline values and the majority of patients showed significant improvements (Table 2). There

were no significant differences between the 6-month and 12-month follow-up scores.

Comparison of FACE-Q outcomes between the two groups

Although there were no significant differences in the 6-month postoperative scores for 'Satisfaction with the eyes', the GEE showed a significant difference in the final 'Satisfaction with the eyes' FACE-Q scores between group A and group B:

the score in group A (skin-only) was 17.5 points higher at 12 months postoperatively than the score in group B (regression coefficient $\beta = 17.5$, $P = 0.012$). However, the GEE showed no significant differences between groups A and B regarding the other FACE-Q scores after upper blepharoplasty (Table 3). Possible confounding variables were included in the model (sex, age, dermatochalasis severity score, and amount of tissue removed during surgery), as well as correction for the baseline FACE-Q scores.

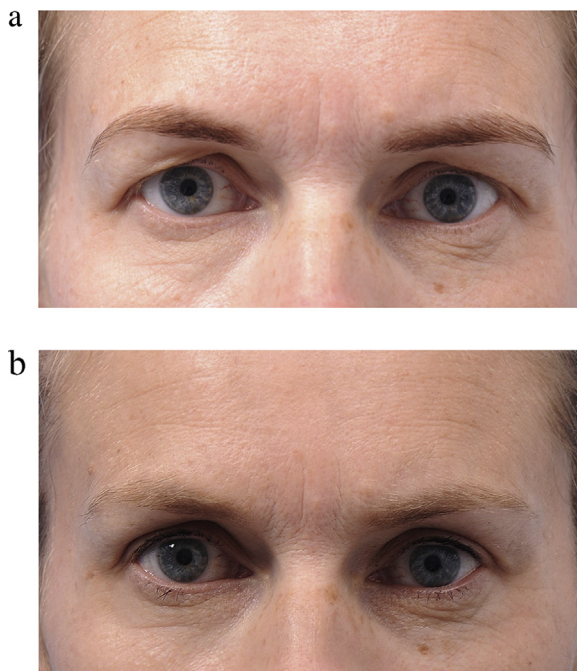


Fig. 4. (A) Preoperative photograph of a participant from group A (skin-only). (B) Photograph 12 months after upper eyelid blepharoplasty (group A; skin-only).

Satisfaction with the results

There was no significant difference in 'Satisfaction with the results' score between the two groups at the 6-month follow-up (median (Q1; Q3): 73 (59; 79) in group A and 71 (51; 100) in group B; $P = 0.433$) or the 12-month follow-up (73 (59; 100) in group A and 73 (51; 87) in group B; $P = 0.602$).

POSAS

The median (Q1; Q3) patient POSAS scores did not differ significantly between group A and group B: 6 (6; 9) in group A and 7 (6; 10) in group B ($P = 0.152$). The overall patient opinion of the scar site was 1 (1; 1) in group A and 1 (1; 2) in group B ($P = 0.468$). Median observer-reported POSAS scores were 7 (7; 8) for group A and 7 (6; 9) for group B ($P = 0.345$). The overall observer (physician) opinion of the scar site was 1 (1; 2) for group A and 1 (1; 2) for group B ($P = 0.897$).

Table 2. Comparison of median (Q1; Q3) pre- and postoperative FACE-Q scores.

	Satisfaction with forehead and eyebrows	Satisfaction with eyes	Appraisal of upper eyelids	Satisfaction with facial appearance	Aging appraisal	Patient- perceived age (VAS)	Social functioning
Group A							
Preoperative	78 (64; 85)	43 (24; 63)	21 (8; 38)	48 (42; 58)	53 (42; 83)	0 (-5; 5)	70 (55; 86)
6 months postoperative	88 (72; 100)	86 (75; 100)*	90 (81; 100)*	79 (60; 94)*	100 (72; 100)*	-3 (-7; 0)	89 (70; 100)*
	(<i>P</i> = 0.247)	(<i>P</i> < 0.001)	(<i>P</i> < 0.001)	(<i>P</i> < 0.001)	(<i>P</i> < 0.001)	(<i>P</i> = 0.083)	(<i>P</i> = 0.003)
12 months postoperative	88 (68; 100)	81 (66; 96)*	90 (70; 100)*	64 (53; 78)*	83 (66; 100)*	-2 (-5; 0)*	81 (70; 100)*
	(<i>P</i> = 0.247)	(<i>P</i> < 0.001)	(<i>P</i> < 0.001)	(<i>P</i> = 0.001)	(<i>P</i> = 0.001)	(<i>P</i> = 0.017)	(<i>P</i> = 0.013)
Group B							
Preoperative	72 (55; 84)	28 (20; 43)	15 (0; 46)	44 (38; 53)	60 (42; 73)	0 (0; 3)	55 (46; 81)
6 months postoperative	80 (70; 94)*	77 (63; 100)*	100 (81; 100)*	61 (51; 92)*	73 (58; 100)*	0 (-5; 3)	77 (59; 98)*
	(<i>P</i> = 0.018)	(<i>P</i> < 0.001)	(<i>P</i> < 0.001)	(<i>P</i> < 0.001)	(<i>P</i> = 0.001)	(<i>P</i> = 0.132)	(<i>P</i> = 0.003)
12 months postoperative	78 (72; 93)*	86 (67; 98)*	90 (75; 100)*	60 (51; 81)*	74 (60; 100)*	0 (-4; 0)	81 (72; 92)*
	(<i>P</i> = 0.006)	(<i>P</i> < 0.001)	(<i>P</i> < 0.001)	(<i>P</i> < 0.001)	(<i>P</i> = 0.002)	(<i>P</i> = 0.060)	(<i>P</i> = 0.007)

Group A: resection of skin only. Group B: resection of skin and a strip of underlying orbicularis oculi muscle.

*Statistically significant improvement in FACE-Q score compared to the baseline FACE-Q score.

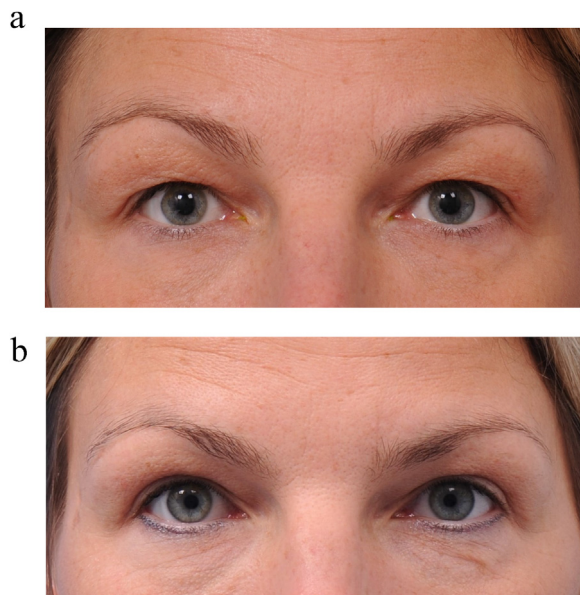


Fig. 5. (A) Preoperative photograph of a participant from group B (skin/muscle). (B) Photograph 12 months after upper eyelid blepharoplasty (group B; skin/muscle).

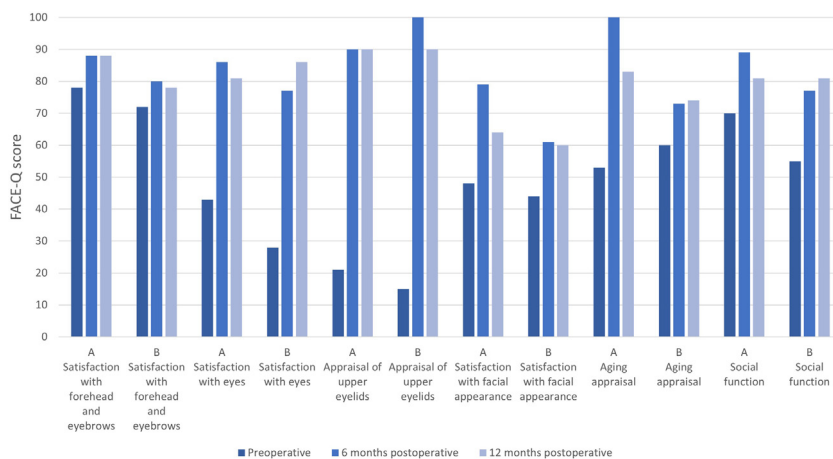


Fig. 6. Median FACE-Q scores.

FACE-Q adverse effects

Table 4 shows the number of patients who reported experiencing certain adverse effects at 6 and 12 months postoperatively. Also, the scoring of any pre-existing eyelid-related problems at baseline was based on the FACE-Q adverse effect questionnaire. According to Table 4, the patients reported a variety of, usually minor, adverse effects. One participant complained strongly about excessive tearing, but she had also reported this in the preoperative questionnaire and this was therefore considered unchanged. The participants were less bothered by each item postoperatively compared to baseline. There were no significant differences in adverse effects between group A and group B.

Discussion

Satisfaction with appearance and improved quality of life are important outcomes for patients undergoing facial aesthetic procedures. Although patient satisfaction is generally high after an upper blepharoplasty, the possible differences in PROs between surgical techniques have scarcely been studied⁶. Nowadays, surgeons tend to be more conservative regarding the removal of orbicularis oculi muscle and orbital fat in order to preserve the volume of the peri-orbital region, which might result in a more youthful appearance.

No significant differences when comparing the skin-only excision technique with the skin/muscle excision were observed, except in the ‘satisfaction with the eyes’ questionnaire, which favoured the skin-only group. This entailed questions

Table 3. Differences in FACE-Q scores between group A and group B.

FACE-Q	Baseline		6 months postoperatively		12 months postoperatively	
	Group A Median (Q1; Q3)	Group B Median (Q1; Q3)	Adjusted difference ^a (95% CI)	P-value	Adjusted difference ^a (95% CI)	P-value
Satisfaction with forehead and eyebrows	78 (64; 85)	72 (55; 84)	0.8 (-12.1 to 13.8)	0.895	0.7 (-13.2 to 14.7)	0.918
Satisfaction with eyes	43 (24; 63)	28 (20; 43)	6.4 (-9.2 to 22.0)	0.100	17.5 (3.8 to 31.1)	0.012*
Appraisal of upper eyelids	21 (8; 38)	15 (0; 46)	2.2 (-11.5 to 15.9)	0.755	8.4 (-7.3 to 24.0)	0.294
Satisfaction with facial appearance	48 (42; 58)	44 (38; 53)	1.7 (-8.8 to 12.3)	0.745	7.5 (-3.5 to 18.6)	0.179
Aging appraisal	53 (42; 83)	60 (42; -73)	-10.0 (-20.7 to 0.7)	0.068	-2.0 (-11.8 to 7.8)	0.689
Patient-perceived age (VAS)	0 (-5; 5)	0 (0; 3)	-0.8 (-1.3 to 3.0)	0.440	0.3 (-1.8 to 2.4)	0.799
Social functioning	70 (55; 86)	55 (46; 81)	-4.5 (-12.5 to 3.5)	0.272	3.7 (-5.6 to 13.0)	0.437
Satisfaction with the result	NA	NA	-7.3 (-5.6 to 20.3)	0.269	-0.4 (-13.5 to 12.7)	0.945

NA, not applicable; VAS, visual analogue scale. Group A: resection of skin only. Group B: resection of skin and a strip of underlying orbicularis oculi muscle.

*Statistically significant.

^aAdjusted difference is the regression coefficient from the generalized estimating equation models, which represents the difference between the treatment groups (group A–group B), adjusted for the baseline values, sex, age, dermatochalasis severity score, and amount of tissue removed.

Table 4. Descriptive statistics of the FACE-Q questionnaire regarding adverse effects after upper blepharoplasty compared to baseline. The numbers indicate the number of patients reporting a particular problem.

Preoperatively		Not at all	A little	Moderately	Extremely	Missing	P-value ^a
Difficulty closing eyes	Group A	26	-	1	-	-	1.000
	Group B	26	1	-	-	-	
Eye dryness	Group A	14	6	7	-	-	0.063
	Group B	11	13	2	1	-	
Tearing excessively	Group A	12	6	7	2	-	0.356
	Group B	14	8	2	3	-	
Irritation of the eye	Group A	7	15	4	1	-	0.278
	Group B	9	10	3	5	-	
Hollowing	Group A	16	8	3	-	-	1.000
	Group B	17	7	2	1	-	
6 months postoperatively		Not at all	A little	Moderately	Extremely	Missing	P-value ^a
Difficulty closing eyes	Group A	25	1	-	-	1	0.610
	Group B	23	3	-	-	1	
Eye dryness	Group A	19	5	2	-	1	0.414
	Group B	19	7	-	-	1	
Tearing excessively	Group A	14	8	4	-	1	0.063
	Group B	20	5	-	1	1	
Irritation of the eye	Group A	16	9	1	-	1	0.499
	Group B	19	5	2	-	1	
Hollowing	Group A	23	2	1	-	1	0.668
	Group B	22	4	-	-	1	
Eyelid scars	Group A	21	4	1	-	1	0.502
	Group B	23	1	2	-	1	
12 months postoperatively		Not at all	A little	Moderately	Extremely	Missing	P-value ^a
Difficulty closing eyes	Group A	25	-	-	-	2	0.490
	Group B	23	1	-	-	3	
Eye dryness	Group A	19	5	1	-	2	0.428
	Group B	16	8	-	-	3	
Tearing excessively	Group A	15	10	-	-	2	0.401
	Group B	16	6	1	1	3	
Irritation of the eye	Group A	16	9	-	-	2	1.000
	Group B	16	8	-	-	3	
Hollowing	Group A	21	4	-	-	2	0.110
	Group B	24	-	-	-	3	
Eyelid scars	Group A	21	2	2	-	2	0.546
	Group B	22	-	2	-	3	

Group A: resection of skin only. Group B: resection of skin and a strip of underlying orbicularis oculi muscle.

^aP-value of difference between group A and group B.

about shape, attractiveness, alert (not tired), open, bright-eyed, nice and youthful eyes, and the skin-only group score was, markedly, 17.5 points higher than the skin/muscle group score, indicating that, for those aspects, the skin-only approach is preferable to skin/muscle resections.

‘Appraisal of the upper eyelids’ was not significantly different between the groups. This FACE-Q item asks about more negative aspects of the upper eyelid (bothered by skin on the eyelashes, saggy upper eyelids, droopy upper eyelids, appearance of eyelid folds, heavy upper eyelids, how tired your upper eyelids make you look, how old your upper eyelids make you look). Therefore, it seems that both surgical techniques provide relief from the negative sequelae such as saggy eyelids (appraisal of the upper eyelids), but the skin-only technique results in higher satisfaction with the eyes.

When the patients were asked if they thought their eyes appeared more ‘hollowed’, the answers following both techniques were comparable. Apparently, the potential volume reduction of the eyelids by removing additional orbicularis oculi muscle was not really noticed by the patients and was not regarded as less appealing within 12 months after the blepharoplasty. These findings are in line with those of previous studies. LoPiccolo et al.¹⁷ described a split-face study ($n = 10$) whereby only skin was removed from one side and skin and orbicularis muscle was removed from the other side, with no significant difference in cosmetic appearance of the eyelids.

In the present study, no significant difference in scarring was observed between the surgical techniques as assessed by both the patients and the observers. This is in line with Saalabian et al.¹⁸ who compared the satisfaction levels of patients according to tissue resection categories (skin, skin/muscle, skin/muscle/fat) and concluded that there were no differences in relation to scar aspects, recovery period, or complication rates.

It is concluded from this study that the upper blepharoplasty patients in both groups reported significant improvements postoperatively regarding the eyes and eyelids, and also in satisfaction with their facial appearance and the aging appraisal. Also, the patient-perceived age decreased, which infers that the patients perceived themselves as looking more youthful than before surgery. The patients also considered themselves to be more social and confident after the upper blepharoplasty. This is in line with the literature¹⁹.

A remarkable result of the study was the more positive appraisal of the forehead and eyebrows after the upper blepharoplasty by both groups. The eyebrows tend to move down after a blepharoplasty, which can have an impact on the aesthetic unit of the eye⁶. However, the extent and influence is not clear in the literature⁶. Satisfaction with the forehead and eyebrows increased by a median of 6 to 10 points, which indicates a 6–10% improvement. However, whether the patients were more satisfied with their eyebrows or their forehead remains unclear. It is hypothesized that a downward movement of the eyebrows tends to smoothen out the wrinkles on the forehead. This theory is supported in part by the study of Huijing et al.²⁰, which showed that forehead lines diminish significantly after an upper blepharoplasty, but they did not show a significant lowering of the eyebrows. Another explanation might be that patients regard themselves as more appealing after an upper blepharoplasty and therefore appraise their general appearance (including eyebrows and forehead) more positively. Nevertheless, the use of a questionnaire that did not discriminate between eyebrows and forehead lines is a limitation of this study. More research has to be done to elucidate this issue further.

In summary, a skin-only or skin/muscle upper blepharoplasty resulted in similar FACE-Q scores regarding the upper eyelids, forehead and eyebrows, overall face, patient-perceived aging and age, social functioning, and satisfaction with the post-operative results, while the FACE-Q score regarding eyes in general was more positive in the skin-only group at the 12-month follow-up. Scarring and other adverse effects did not differ between the two techniques.

Thus, an upper blepharoplasty results in increased satisfaction with appearance, regardless of the conservation of the orbicularis oculi muscle. In the authors’ opinion, since the results are comparable, the least invasive method should be used. Additionally, when considering the eyes in general, the skin-only technique is preferable. The surgical technique may be tailored to the needs of the individual patient. The authors consider that the removal of a strip of orbicularis oculi muscle should not be a standard procedure but only performed on indication. Also, there is still a need for more knowledge about other aspects of the surgical technique, such as the desired shape of the skin excision and whether the techniques have different objective functional outcomes.

Funding

None.

Competing interests

None.

Ethical approval

Obtained from the Medisch Ethische Toetsingscommissie (METC) of the University Medical Center Groningen (METC2017/451).

Patient consent

Patient consent was obtained.

Acknowledgements. We would like to thank Rogier Trompert for his artistic contribution.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ijom.2022.02.007>.

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