

## DERMATOLOGIC SURGERY

# Aesthetic outcome and complications of simple interrupted versus running subcuticular sutures in facial surgery: A randomized controlled trial

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**Background:** The suturing technique and its associated complications could affect cosmetic outcome after facial surgery. Literature on this topic is limited.

**Objective:** To compare the cosmetic results 12 months after treatment and complications associated with simple interrupted sutures (SIS) versus running subcuticular sutures (RSS) in facial surgery.

**Methods:** A randomized, controlled multicenter trial was performed. Adults receiving dermatologic surgery on the face were randomized to receive SIS or RSS for wound closure. The primary outcome was the overall opinion score on the Patient and Observer Scar Assessment Scale (POSAS) 12 months after surgery. Secondary outcomes were the complication rates and scores according to alternative methods for assessment of cosmetic outcome. The observer of cosmetic outcome was blinded to treatment assignment.

**Results:** 142 patients were randomized to receive SIS (n = 73) or RSS (n = 69). Twelve months after surgery, the median score of the overall opinion on the POSAS was 2.0 (range 1-8) according to the patients and 3.0 (range 1-8) according to the observer in both groups. In the RSS group, hyper- or hypoesthesia was reported more often.

**Limitations:** The cosmetic result was assessed by 1 observer.

**Conclusion:** SIS and RSS in facial surgery resulted in comparable cosmetic outcomes. RSS was more often associated with hyper- or hypoesthesia. (J Am Acad Dermatol <http://dx.doi.org/10.1016/j.jaad.2017.04.1128>.)

**Key words:** aesthetic outcome; complications; cosmetic result; dermatologic surgery; POSAS; running subcuticular suture; simple interrupted suture; suturing technique; wound healing.

Due to the rise in the incidence of skin cancer, facial surgery is being performed with increasing frequency by dermatologists and plastic surgeons all over the world. Simple interrupted sutures (SIS) and running subcuticular sutures (RSS) are frequently used in dermatologic surgery. The suturing technique might influence the

final aesthetic outcome. Currently, because of a lack of evidence, the choice of suturing technique is largely dependent on the surgeon's preference. Two earlier original studies have looked into this subject and found no difference in cosmetic outcome of wounds closed by SIS or RSS.<sup>1,2</sup> However, long-term evaluation is lacking in both studies. In

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addition, the occurrence of postoperative complications should also be taken into account when comparing both techniques. Earlier research on wounds following cardiac surgery suggested that RSS was associated with more infections than SIS, although this was not the case in wound healing after appendectomies.<sup>3-5</sup> Literature addressing this topic in dermatologic surgery is not available.

The goal of this study was to compare the long-term aesthetic outcome and incidence of complications of facial wounds closed with SIS and RSS.

## METHODS

### Patients

This study was a randomized, controlled multicenter trial. Patients were recruited from the Department of Dermatology of the Maastricht University Medical Center, the Department of Dermatology of Catharina Hospital Eindhoven, and the Department of Plastic Surgery of Zuyderland Medical Center in The Netherlands.

Adult patients receiving conventional excision or Mohs micrographic surgery (MMS) on the face with an expected primary closure of a defect >4 mm were approached for participation. One lesion per patient was included. Excluded were patients with tumors located on the ears, nose, eyelids, or mucosal parts of the lips and patients with a history of hypertrophic or keloid scarring. The study protocol conformed to the guidelines of the Declaration of Helsinki and was approved by the Medical Ethical Committee of Maastricht University. All patients gave written informed consent before inclusion.

Patients were randomized into 2 groups: 1 receiving SIS and the other RSS. A computer-generated list, created using random permuted blocks of 6, that was stratified by hospital was used for randomization. The allocation configuration was generated and concealed until interventions were assigned by a secretary not involved in the trial.

### Interventions

In all procedures, local anesthesia was achieved with lidocaine hydrochloride 1% and epinephrine 1:100,000. In MMS, additional long-lasting, local anesthesia was achieved with bupivacaine 0.5%. All wounds were sutured in layers; for tension-relieving deep sutures, absorbable, synthetic braided

or monofilament material was used. The skin was closed with nonabsorbable monofilament sutures. The brand of suturing material was dependent upon availability at the department. Sutured wounds were supported by adhesive closure strips and a clean pressure dressing. No occlusive dressing was used. Patients were advised to keep the wound dry until suture removal. No antibiotic prophylaxis was prescribed in the studied population.

Both SIS and RSS were removed 1 week after surgery. A high sun protection factor sunscreen (Daylong Actinica, Galderma SA, Lausanne, Switzerland) was offered to all patients that needed to be applied onto the scar daily for 3 months after suture removal to standardize postsurgical cosmetics usage. Patients were advised not to apply any other medication or cosmetics onto the scar. None

of the scars received any revision during the 12-month study period.

### Outcome measures

The primary outcome in this study was the aesthetic outcome 12 months after surgery as assessed by the overall impression on the Dutch Patient and Observer Scar Assessment Scale (POSAS) version 2.0.<sup>6</sup> Secondary outcome measures were the incidence of complications and scores according to alternative methods for assessment of cosmetic outcome, including the 4-point scale (excellent, good, fair, bad) and measurement with a colorimeter.

The cosmetic result was evaluated at 3 and 12 months after surgery. The patient completed the assessment according to the Patient Scar Assessment Scale (PSAS) and the 4-point scale. A researcher, blinded to the suturing technique, assessed the scars in person by using the Observer Scar Assessment Scale (OSAS) and the 4-point scale.

The PSAS score grades 6 aspects (color, pliability, thickness, relief, itching, and pain) each with a 10-point scale. Assessments with the OSAS were also based on 6 items (vascularity, pigmentation, pliability, thickness, relief, and surface area). Each variable was scored 1-10 with 1 resembling normal skin and 10 the worst scar imaginable. The total PSAS and OSAS scores were calculated by summing the scores for all 6 items. The total score can vary from 6 to 60 with a higher score indicating a worse scar. In

## CAPSULE SUMMARY

- Simple interrupted and running subcuticular sutures are frequently applied in facial surgery.
- Both methods yield similar cosmetic results at 12 months after surgery. Dysesthesia was more frequent with running subcuticular sutures, although the risk of other postoperative complications was comparable.
- Simple interrupted sutures might be preferred in facial surgery.

*Abbreviations used:*

ITT:	intention to treat
MMS:	Mohs micrographic surgery
OSAS:	Observer Scar Assessment Scale
POSAS:	Patient and Observer Scar Assessment Scale
PP:	per protocol
PSAS:	Patient Scar Assessment Scale
RSS:	running subcuticular suture
SD:	standard deviation
SIS:	simple interrupted suture

addition, both patients and observers gave an overall opinion of the scar on a scale of 1 to 10, with 10 indicating the worst scar imaginable.

The 4-point scale was used to classify scars as

- excellent (defined as no obvious scarring, atrophy, or induration and slight or no redness or change in pigmentation compared with adjacent skin),
- good (defined as no obvious scarring, atrophy, or induration or moderate redness or increase in pigmentation compared with adjacent skin),
- fair (defined as slight-to-moderate scarring, atrophy, or induration or significant redness or increase in pigmentation compared with adjacent skin) or
- poor (defined as extensive occurrence of scarring, atrophy, or induration or redness or increase in pigmentation compared with adjacent skin).

In addition to the 2 scales, the observer marked whether suture marks were present or absent.<sup>7</sup> Furthermore, at 12 months after surgery, an objective assessment of the scar was made with a colorimeter (Minolta Chromameter CR-400, Minolta Camera co, Ltd, Chiyoda, Japan) that measured color on the basis of principles established by the International Commission on Illumination.<sup>8,9</sup> The outcome was expressed in 3 parameters: L\*, which expressed the lightness of the scar (0 being black and 100 being perfectly white); a\*, which indicated the erythema of the scar (positive values indicated red and negative green); and b\*, which indicated the pigmentation of the scar (positive values indicated yellow and negative blue). Two measurements were made consecutively and the average was reported. To compare the color of the scar with the patient's own skin color, normal skin adjacent to the scar was measured. Before the measurements, the colorimeter was calibrated to a standard white plate (Minolta Camera co, Ltd).

The following complications were recorded: hemorrhage, surgical site infection, wound dehiscence, and hyper- or hypoesthesia. At 1 week, 3 months, and 12 months after surgery, patients were questioned about complications and their files

were checked for verification. Hemorrhage had to occur within 7 days after the surgery and required pressure dressing, coagulation, or suturing. Surgical site infection had to occur within 30 days and required incision and drainage or antibiotics. Dehiscence of the wound was recorded by the research assistant at suture removal.

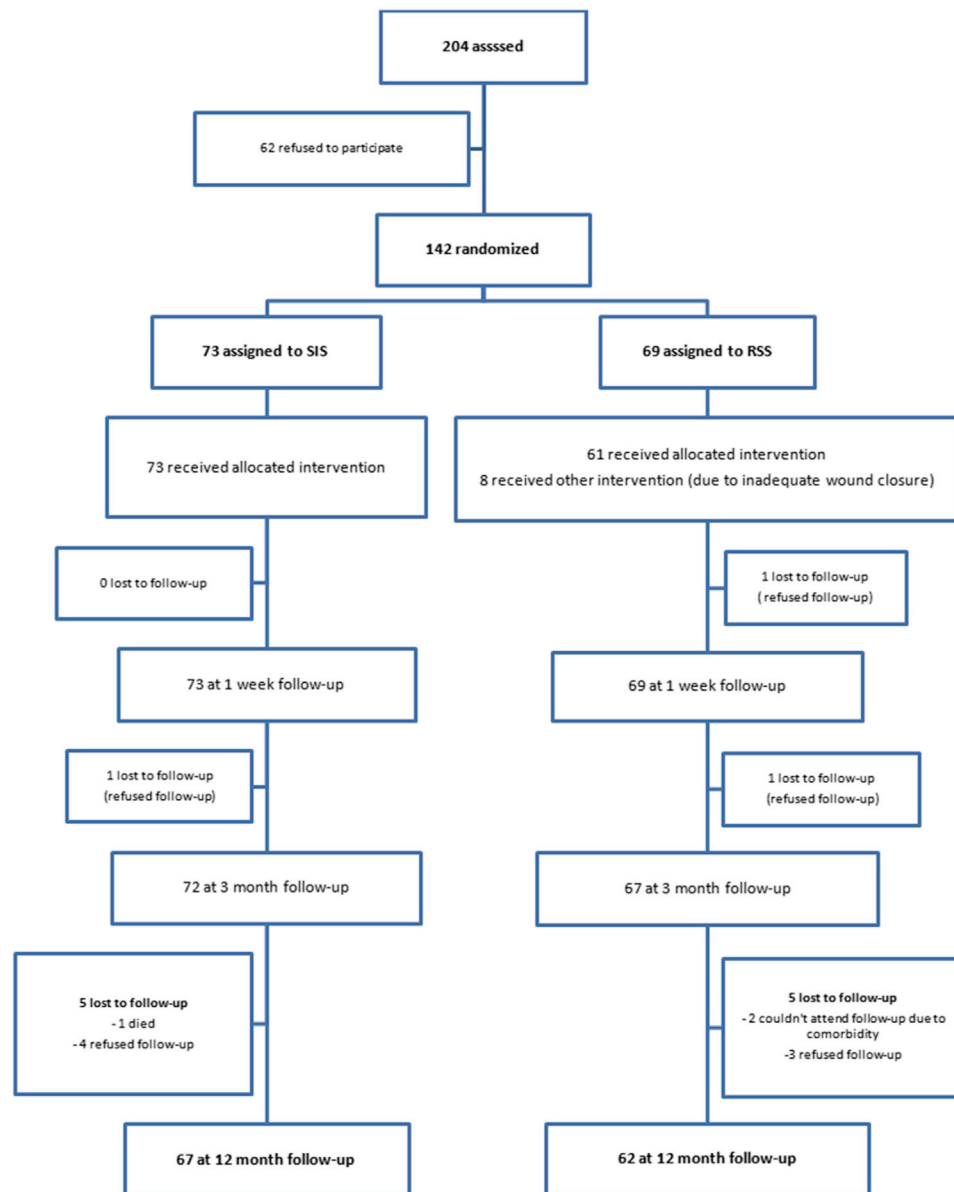
### Statistical analysis

In our earlier study, a mean score of 3.7 with a standard deviation (SD) of 1.6 was observed on the overall opinion of the OSAS.<sup>7</sup> To enable detection of a clinically relevant difference of 1 point with a power of 90% and a significance level of 5% (2-sided), a total of 108 patients were required. An allocation ratio of 1:1 indicated recruitment of 54 per group. Inclusion of a minimum of 120 patients (60 per group) was planned to account for a loss to follow-up of 10%.

Differences between the randomized groups were tested for statistical significance using the chi-square test for categorical variables. For continuous variables the t-test for independent samples was used for normally distributed variables or the Mann-Whitney U test for not normally distributed variables. Both intention-to-treat (ITT) and per-protocol (PP) analyses were performed. *P* values  $\leq .05$  were considered to indicate statistical significance. Analysis was performed using IBM SPSS Statistics version 20.0.0.1.

### RESULTS

From April 1, 2014, to April 1, 2015, a total of 204 patients met the inclusion criteria (Fig 1), and 142 consented to participate. Sixty-two patients did not want to participate, mainly because of a preference for 1 of the suturing techniques or refusal to make the extra visits to the hospital at 3 and 12 months as required by the study. Of the 142 randomized patients, 73 were assigned to SIS and 69 RSS. Baseline characteristics are shown in Table 1. All patients assigned to the SIS group received SIS. Three of them received a re-excision, and those wounds were closed again with SIS. Of the 69 patients assigned to the RSS group, 61 received RSS. The other 8 patients received SIS because adequate wound approximation could not be achieved with RSS. Five of these patients had a tumor located on the cheek, 2 had a tumor located on the chin, and 1 had a tumor on the forehead. In addition, 2 of the 61 patients who received RSS initially, received SIS sutures later due to wound dehiscence and re-excision. Thirteen patients were lost to follow-up in the studied period.



**Fig 1.** Flow chart of inclusion and randomization. SIS, Simple interrupted suture; RSS, running subcuticular suture.

Few examples of the scars with their corresponding POSAS scores are shown in Fig 2. The cosmetic results at 12 months after surgery are shown in Table II. The median scores on the overall opinion of the OSAS (3.0) and PSAS (2.0) were identical in both groups. Total OSAS (9.0 for SIS and 10.0 for RSS) and PSAS scores (8.0 for both groups) were also similar. According to the 4-point scale, the distribution of the scores showed no significant differences between SIS and RSS, although a slightly greater proportion of patients and observers rated the scar as excellent or good in the SIS group. The results of the ITT analyses were analogous to those of the PP

analyses. In a subgroup of patients who received SIS (16.4% ITT and 16.0% PP), a permanent suture mark was left. Permanent suture marks were more frequently observed in patients with Fitzpatrick skin type I (23.1% ITT vs 5.3% PP) and in patients with operations done in the frontal area (30.8% ITT vs 16.4% PP). When comparing the patients with and without suture marks resulting from SIS, patients with suture markers were scored higher when using the observer's overall impression (median, 4.0 vs 2.0) and total OSAS (median, 12.0 vs 8.0). In contrast, patients did not score their scars differently whether or not suture marks were present. In the SIS group,

**Table I.** Baseline characteristics according to randomization

Characteristic	Category	SIS group		RSS group	
		N	%	N	%
Sex	Male	45	61.6	47	68.1
	Female	28	38.4	22	31.9
Age, mean ( $\pm$ SD)		67 ( $\pm$ 12.5)		67 ( $\pm$ 15.0)	
Skin type	I	7	9.6	3	4.3
	II	60	82.2	59	85.5
	III	6	8.2	4	5.8
	IV	0	0	2	2.9
Immunosuppression	Yes	4	5.5	3	4.3
	No	69	94.5	65	94.2
Anticoagulants	Yes	27	37.0	28	40.6
	No	46	63.0	40	58.0
Sun exposure*	Chronic	27	37.0	28	40.6
	Intermittent	33	45.2	28	40.6
	Seldom	13	17.8	11	15.9
Smoking	Active	12	16.4	13	18.8
	Quit	42	57.5	38	55.1
	Never	19	26.0	17	24.6
Alcohol	Regularly	51	69.9	45	65.2
	Occasionally	7	9.6	10	14.5
	Never	15	20.5	13	18.8
Tumor size, mean ( $\pm$ SD)	Length, mm	7.2 ( $\pm$ 3.9)		8.0 ( $\pm$ 3.8)	
	Width, mm	6.6 ( $\pm$ 3.5)		7.4 ( $\pm$ 3.5)	
Type of tumor	Malignant	53	72.6	53	76.8
	Benign/Premalignant	20	27.4	16	23.2
Location	Frontal	18	24.7	9	13.0
	Temporal	20	27.4	18	26.1
	Cheek	30	41.1	30	43.5
	Periocular	1	1.4	4	5.8
	Perioral	4	5.5	8	11.6
Specialty	Dermatology	55	75.3	52	75.4
	Plastic surgery	18	24.7	17	24.6
Total		73		69	

RSS, Running subcuticular suture; SD, standard deviation; SIS, simple interrupted suture.

\*Sun exposure was defined as chronic if one had outdoor work or had lived in tropical area's for  $\geq 5$  years, as intermittent if one had indoor work but spend vacations out in the sun, and as seldom if one rarely sunbathed.

the color difference between normal skin and scarred skin measured by the colorimeter had a mean value of  $-0.4$  (SD 5.3) on the  $L^*$  parameter (black/whiteness),  $1.4$  (SD 2.9) on the  $a^*$  parameter (erythema), and  $-4.0$  (SD 2.9) on the  $b^*$  parameter (pigmentation). The  $L^*$ ,  $a^*$ , and  $b^*$  values were  $-1.3$  (SD 3.4),  $1.1$  (SD 2.9), and  $-3.8$  (SD 2.5), respectively, in the RSS group.

Table III shows the scores at 3 months after surgery. No statistically significant differences between the SIS and RSS group were observed. The scores on cosmetic outcome at 12 months were slightly better than the ones found at 3 months after surgery, indicating improvements of the scars over time.

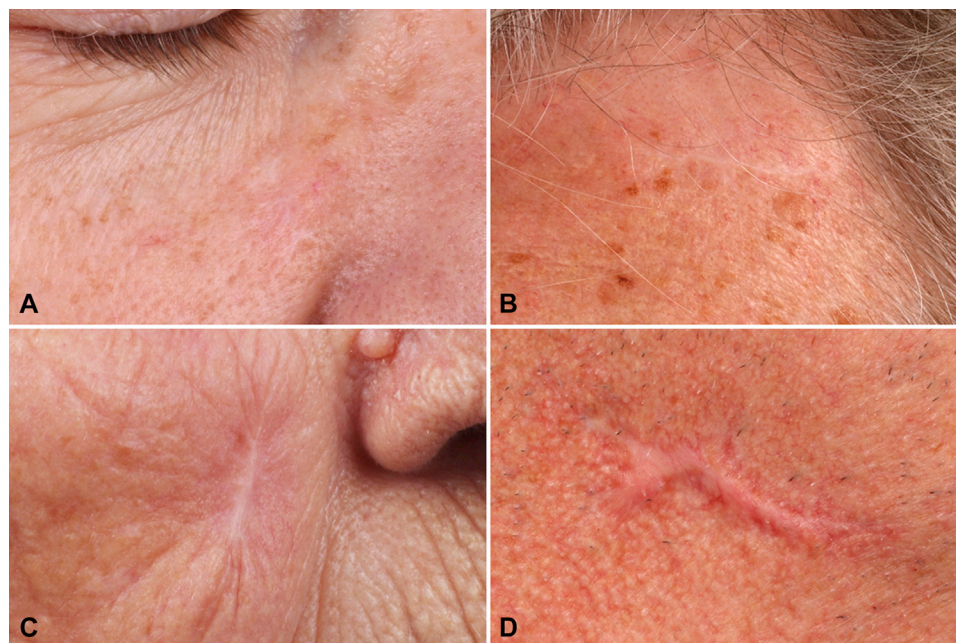
Complications of both suturing techniques are presented in Table IV. The frequency of hemorrhage,

infection, or wound dehiscence was similar in both groups. The RSS group did tend to have more patients with hyper- or hypoesthesia of their scars at 12 months (12.9% ITT, 11.1% PP) compared with the SIS group (4.5% ITT, 6.7% PP), although this difference was not statistically significant. A hypertrophic scar developed on 2 patients, 1 in each group.

## DISCUSSION

This randomized controlled trial showed that 12 months after surgery, both the observer and the patient rated the aesthetic outcome of SIS and RSS equally. RSS was associated with a slight higher rate of hyper- or hypoesthesia, while other postoperative complications occurred at a similar frequency in both groups.





**Fig 2.** Examples of scars at 12 months and their corresponding POSAS (Patient and Observer Scar Assessment Scale) scores. **A**, Right cheek of 55-year-old woman. OSAS: overall opinion 1; total score 7. PSAS: overall opinion 2; total score 9. **B**, Left frontal area of 72-year-old man. OSAS: overall opinion 3; total score 10. PSAS: overall opinion 1; total score 6. **C**, Right cheek of 79-year-old woman. OSAS: overall opinion 4; total score 11. PSAS: overall opinion 3; total score 12. **D**, Chin of 46-year-old man. OSAS: overall opinion 8; total score 20. PSAS: overall opinion 8; total score 35.

Our study confirmed the results of 2 earlier studies, finding a similar aesthetic outcome of both suturing techniques.<sup>1,2</sup> Orozco-Covarrubias et al compared the cosmetic results of facial linear scars using a self-developed 3-point scale (excellent, good, or poor), and Blouin et al applied the 100-point visual analog scale, 5-point Stony Brook Scar evaluation scale, and 6-point wound evaluation scale. Follow-up in the Orozco-Covarrubias et al and the Blouin et al studies was limited to 3 months and 6 months, respectively. In addition to the evidence already available, we have shown that this finding is still persistent at long-term follow-up assessed by POSAS, the 4-point scale, and the colorimeter. Although in our study a slightly larger proportion of the scars were rated as excellent or good on the 4-point scale in the SIS group by both the observer and the patient, this difference was not statistically significant.

The evaluation of aesthetic outcome has always been challenging because no gold standard exists. Patients tended to evaluate their scars as better than the observers in this study, indicated by the patients lower median scores on overall opinion and a lower total score of the PSAS compared with the total score of the OSAS. In addition, several earlier studies have

shown that patients weight various aspects of the scar quite differently than the observers.<sup>6,7,10,11</sup> For example, itch and pain can negatively contribute to the overall opinion of the patient, while these factors are not perceivable to the observer. Although most assessment scales are designed for an objective appraisal of the aesthetic appearance of the scar by the observer, the patient's perspective (including aspects that are not strictly aesthetic) is also of great importance.<sup>12</sup>

Color is 1 of the important characteristics of scars.<sup>7,10,11</sup> According to the POSAS, color is assessed as a whole by the patient and as pigmentation and vascularity by the observer. A more objective method to assess the different aspects of color is the Minolta Chromameter as shown in an earlier study.<sup>13</sup> No color differences were observed between either suturing techniques as measured with the colorimeter at 12 months after surgery.

Permanent suture marks are 1 of the reasons some surgeons prefer RSS in facial surgery.<sup>14</sup> We observed the persistence of suture marks in 16% of the patients in the SIS group. While observers consider scars with suture marks less cosmetically acceptable than those without, patients did not score their scar differently whether or not suture marks were present.

**Table II.** Cosmetic results at 12 months

Scale	Intention to treat			Per protocol		
	SIS	RSS	P	SIS	RSS	P
<b>Observer</b>						
Overall opinion, median (range)	3.0 (1-8)	3.0 (1-8)	.19	3.0 (1-8)	3.0 (1-8)	.41
Total OSAS, median (range)	9.0 (6-30)	10.0 (6-23)	.12	9.0 (6-23)	10.0 (6-22)	.55
4-point scale, n/total (%)			.58			.99
Excellent	25/67 (37.3)	19/62 (30.6)		26/75 (34.7)	18/54 (33.3)	
Good	32/67 (47.8)	28/62 (45.2)		35/75 (46.7)	25/54 (46.3)	
Average	9/67 (13.4)	14/62 (22.6)		13/75 (17.3)	10/54 (18.5)	
Poor	1/67 (1.5)	1/62 (1.6)		1/75 (1.3)	1/54 (1.9)	
<b>Patient</b>						
Overall opinion, median (range)	2.0 (1-7)	2.0 (1-8)	.65	2.0 (1-7)	2.0 (1-8)	.73
Total PSAS, median (range)	8.0 (6-34)	8.0 (6-47)	.13	9.0 (6-38)	8.0 (6-47)	.77
4-point scale, n/total (%) <sup>†</sup>			.15			.12
Excellent	17/66 (25.8)	19/61 (31.1)		17/74 (23.0)	19/53 (35.8)	
Good	46/66 (69.7)	33/61 (54.1)		52/74 (70.3)	27/53 (50.9)	
Average	3/66 (4.5)	8/61 (13.1)		5/74 (6.8)	6/53 (11.3)	
Poor	0/66 (0)	1/61 (1.6)		0/74 (0)	1/53 (1.9)	
Difference between scar and normal skin measured by the colorimeter, mean (SD)						
L*	−0.4 (5.3)	−1.3 (3.4)	.24	−0.6 (5.2)	−1.1 (3.4)	.25
A*	1.4 (2.9)	1.1 (2.9)	.83	1.4 (2.8)	1.1 (3.0)	.68
B*	−4.0 (2.9)	−3.8 (2.5)	.63	−4.0 (2.9)	−3.8 (2.6)	.84

OSAS, Observer Scar Assessment Scale; PSAS, Patient Scar Assessment Scale; SD, standard deviation; SIS, simple interrupted suture; RSS, running subcuticular suture.

<sup>†</sup>For 2 patients, the assessment of the scar was only made by the researcher and not the patient. One patient in the SIS group was diagnosed with progressive dementia and could not make the assessment adequately; 1 patient in the RSS group was admitted to the hospital at the time of assessment and was not willing to fill in the questionnaire.

**Table III.** Cosmetic results at 3 months

Scale	Intention to treat			Per protocol		
	SIS	RSS	P	SIS	RSS	P
<b>Observer</b>						
Overall opinion, median (range)	3.5 (1-8)	4.0 (1-8)	.60	4.0 (1-8)	3.0 (1-8)	.64
Total OSAS, median (range)	11.0 (6-23)	12.0 (6-22)	.29	11.0 (6-30)	11.5 (6-23)	.56
4-point scale, n/total (%)			.78			.55
Excellent	17/72 (23.6)	12/67 (17.9)		18/81 (22.2)	11/58 (19.0)	
Good	30/72 (41.7)	32/67 (47.8)		32/81 (39.5)	30/58 (51.7)	
Average	23/72 (31.9)	22/67 (32.8)		29/81 (35.8)	16/58 (27.6)	
Poor	2/72 (2.8)	1/67 (1.5)		2/81 (2.5)	1/58 (1.7)	
<b>Patient</b>						
Overall opinion, median (range)	2.0 (1-8)	2.0 (1-8)	.52	2.0 (1-8)	2.0 (1-8)	.08
Total PSAS, median (range)	10.0 (6-32)	12.0 (6-47)	.51	12.0 (6-35)	11.5 (6-47)	.69
4-point scale, n/total (%)			.78			.68
Excellent	16/72 (22.2)	15/67 (22.4)		16/81 (19.8)	15/58 (25.9)	
Good	49/72 (68.1)	43/67 (64.2)		55/81 (67.9)	37/58 (63.8)	
Average	7/72 (9.7)	9/67 (13.4)		10/81 (12.3)	6/58 (10.3)	
Poor	0/72 (0)	0/67 (0)		0/81 (0)	0/58 (0)	

OSAS, Observer Scar Assessment Scale; PSAS, Patient Scar Assessment Scale; SD, standard deviation; SIS, simple interrupted suture; RSS, running subcuticular suture.

Apparently, patients regard other aspects of the scar as far more important than the presence of suture marks. This could be subjective and dependent upon the personal background and culture of the patient.

Although incorporated in different scar assessment scales such as the SBSES<sup>15</sup> and SCAR scale,<sup>16</sup> the clinical relevance of suture marks for patients remains debatable. It has to be said, that despite the

**Table IV.** Complications in both groups

Complication	Intention to treat			Per protocol		
	SIS	RSS	P	SIS	RSS	P
Hemorrhage, n/total (%)	4/73 (5.5)	3/68 (4.4)	.77	4/80 (5.0)	3/61 (4.9)	.98
Infection, n/total (%)	1/73 (1.4)	2/68 (2.9)	.52	1/80 (1.3)	2/61 (3.3)	.41
Wound dehiscence, n/total (%)	4/73 (5.5)	4/68 (4.4)	.77	4/80 (5.0)	3/61 (4.9)	.98
Hyper- or hypoesthesia at 3 months, n/total (%)	6/72 (8.3)	5/67 (7.5)	.85	8/81 (9.9)	3/58 (5.2)	.31
Hyper- or hypoesthesia at 12 months, n/total (%)	3/67 (4.5)	8/62 (12.9)	.09	5/75 (6.7)	6/54 (11.1)	.37

RSS, Running subcuticular suture; SIS, simple interrupted suture.

persistence of suture marks in a certain subgroup of patients receiving SIS, the overall cosmetic appearance of SIS and RSS were equally rated. This could indicate that SIS might have even resulted in better cosmesis if suture marks were totally absent.

This study is the first randomized controlled trial evaluating postoperative complications of RSS and SIS in facial surgery. A recent Cochrane review concluded that superficial wound dehiscence might be reduced by RSS, although this was based on limited evidence and studies of nondermatologic surgeries, such as abdominal and open-heart surgery.<sup>17</sup> We have found similar proportions of patients who have experienced wound dehiscence, infection, or hemorrhage in both groups and more dysesthesia occurred in the RSS group. According to the literature, the use of occlusive dressing could promote wound healing and reduce complications.<sup>18</sup> We did not apply an occlusive dressing in the current study.

Several limitations of this study need to be mentioned. First, a single observer did all the assessments of cosmetic outcome. Although the same observer evaluated all scars in both groups at 12 months, the adoption of multiple observers would have increased the reliability of the assessment and might have increased the potential to detect subtle differences between the suturing techniques. However, objective measurements on the color aspect of the scars with a colorimeter did not reveal differences. Second, treatment crossover occurred in 8 of the patients from the RSS group. To assess the impact of these crossovers, PP analysis was performed and showed similar results as the ITT analysis. Finally, due to availability in different hospitals, various brands of suture materials were used. Ideally, this study would have been comparing surgeries in which the same suture material was applied, but this was not feasible. Therefore, stratification by hospital was used to ensure an even distribution of types of suture material in both groups.

In conclusion, this randomized controlled trial showed similar aesthetic outcomes of simple interrupted and running subcuticular sutures in facial dermatologic surgery. Hyper- or hypoesthesia occurred more frequently in running subcuticular sutures, possibly favoring the choice for simple interrupted sutures.

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