Cosmetic Outcomes of Three Skin Closure Techniques for Submandibular Surgical Incisions in a Nigerian Tertiary Hospital

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ABSTRACT

Objective: The face is an important part of the body used for identification, communicative, and adornment roles. Due to its prominence, injuries and scars on the face may have psychological impact on individuals living with them.

This study aimed at comparing cosmetic outcomes of submandibular incisions using subcuticular suturing, tissue adhesive, and percutaneous stapler, among maxillofacial surgical patients at the Oral and Maxillofacial Department of Aminu Kano Teaching Hospital, Kano. Complications and duration of wound closure for each of the three techniques were also assessed.

Materials and methods: The study was a prospective cross-sectional study with a calculated sample size of 60 subjects recruited and randomly allotted into three groups A, B, and C, at the Oral and Maxillofacial Department of Aminu Kano Teaching Hospital, Kano. Group A had subcuticular wound closure of submandibular incisions, while groups B and C had tissue adhesive and staples closures of submandibular incisions respectively. Intraoperatively, each wound's length (centimeters) and closure time (minutes) were recorded, and the closure time per unit length (min/cm) for each wound was calculated and recorded. The Patient and Observer Scar Assessment Scale (POSAS) was used to assess cosmetic outcomes of the incision scars on postoperative days 10, 30 and 90 and comparisons of the POSAS scores and closure times per unit lengths of the wounds were also done using Kruskal Wallis statistical test.

Results: Fifty-six subjects with ages 18 to 60 years (mean=35±12years) and a male: female ratio of 2.3:1. completed the study. Patient scale scores of POSAS showed a significant statistical difference ($p \leq 0.05$) in outcome scores on POD10 ($p<0.001$) and POD30 ($p=0.04$) with tissue adhesive scars having the best cosmetic rating on both days.

The Observer scale scores showed that wound closure with tissue adhesives had a significantly better outcome on POD10($p<0.001$). There was no significant difference in observer outcome scores between the 3 closure techniques on POD30 ($p=0.12$) and POD90 ($p=0.73$).

Analysis of the closure time per unit wound length showed that the subcuticular technique had the longest closure time per unit length, mean = 2.01±0.54min/cm. Tissue adhesive had a mean = 0.45±0.65min/cm, while staple had the shortest closure time per unit length, mean=0.18±0.03min/cm. There was a statistically significant difference in closure time across all wound closure techniques ($p < 0.001$)

Conclusion

Use of tissue adhesives yielded the best cosmetic outcome in the early post-operative period, even though all the wounds had the same cosmetic outcome after 3 months. The use of staples was the fastest of the three methods of closure.

INTRODUCTION

The face is an important part of the body, serving many social functions like personal identification, adornment, and expression of emotions.[1-3] It is frequently viewed by others, therefore, any facial disfigurement can have a great psychological effect on the individual.[1,2] The causes of facial disfigurement from scarifications include trauma, surgery, and traditional scarification. Excessive scaring with the formation of keloid or hypertrophic scars is a common problem seen in blacks.[4-6] Meanwhile, complex genetic mechanisms have been adduced to be responsible for keloid scars.[5]

Surgical incisions always heal with scars, therefore, maxillofacial surgeons strive to achieve cosmetic wound closure by paying attention to sound surgical principles to prevent unsightly scars.[7] The principle comprises, but is not limited to, placement of incision along skin crease, meticulous tissue handling, layered closure with underlying cavity obliteration, and tension-free closure, also employed to improve the cosmetic outcome of surgical scars.[8,9,10]

Suturing is the oldest and most common of the wound closure techniques.[11] Suturing is simple to learn and use. It is also cheap and affordable, however, it may be associated with presence of hatch signs, keloids and hypertrophic scars.[12] Transmission of blood borne diseases and needle pricks could also be its complication which may pose serious health hazards.[12,13]

A unique method of wound closure is the use of subcuticular suturing. Subcuticular wound closure is cosmetically pleasing since the sutures are buried in the tissue leaving no cross hatch marks as seen in conventional suturing.[14] It is, however, technique sensitive, and may be associated with impalement injuries.[14] These enumerated problems with conventional and subcuticular suturing techniques have led to the development of newer methods of wound closure.

Staple is one of the newer wound closure techniques which was invented as early as 1908.[15] Its use has not been popular as a result of its unavailability in resource limited settings, high cost, and technique sensitivity.[16]

Surgical glues like cyanoacrylate skin glue are one of the newer wound closure techniques which was invented in the past four decades to solve some of the problems associated with the conventional methods. It eliminates problems of hatch marks, impalement injuries, and the risk of transmission of blood borne diseases.[17] Cyanoacrylate skin glue has antibacterial property which lowers rate of wound infection and dehiscence. The main challenge with their use in maxillofacial wound closure is their high cost, as this limits their utilization especially in resource limited settings.[18]

The impact of complicated scars is enormous and may affect psychosocial interactions of affected patients.[19,20] The aim of this study was to compare the cosmetic outcomes of submandibular incisions following closure with subcuticular suturing, staples and cyanoacrylate glue in major maxillofacial surgeries at the Oral and Maxillofacial Department in Aminu Kano Teaching Hospital, Kano to improve scar cosmetic outcomes.

METHODS

The study was conducted at the Oral and Maxillofacial Surgery department of Aminu Kano Teaching Hospital, Kano among patients who required submandibular incision for surgical access in elective major maxillofacial surgeries. The study protocol was approved by the Aminu Kano Teaching Hospital, Kano research and Ethics committee (NHREC/21/08/AKTH/EC/2112) and was conducted over a period of one year from November 2018 to October 2019.

The study was a cross-sectional prospective study which involved randomization of subjects into three groups based on the method of closure of the submandibular incisions: A – the subcuticular suturing closure group, B – the percutaneous staples closure group and C – the cyanoacrylate glue (N butyl 2 cyanoacrylate) closure group. A calculated sample size of 60 was derived using a standard formula, including adjustment for 10% attrition among the

subject who were serially recruited as they were admitted for their surgeries. Only patients aged 18 to 60 years who signed an informed consent and required submandibular access incisions for elective surgeries under general anaesthesia were included in the study.

After admission for surgery, informed consent for the study was signed and the subjects were randomized into three groups using an online randomization chart created at www.randomization.com. Necessary socio-demographic variables and the diagnoses for each subject were obtained and recorded in data extraction forms (appendix III) assigned for each subject.

Intraoperatively, following the completion of the main surgical procedures, closure of the access incisions was carried out up to the subcutaneous layers. The wound lengths were then measured after apposition of the subcutaneous layers by adapting Vicryl® sutures along the wound's length from one end to the other and transferring the length of the suture corresponding to the wound length, to metal rulers for measurement. The obtained length of the wound was then recorded. All the wound closures were performed by a single consultant surgeon. Time of closure for each wound was measured by a calibrated timekeeper using stopwatch. Timing commenced either when the needle first penetrated tissue to perform subcuticular closure, at the beginning of the first application of adhesive on the wound edges for adhesive wound closure, or when the stapler was placed on the wound edge to apply the first staple in staple wound closure. Timing ended either when the last suture was cut, at the end of the last application of tissue adhesive or when the last percutaneous staple was applied. Subsequently, time (for closure) per unit wound length was calculated and recorded.

Staples application

Emzor metal staplers from Emzor® Pharmaceuticals of Nigeria were used for all subjects. The skin edges were gently everted and approximated together by a trained surgical assistant. The surgical staples were subsequently applied across the entire length of the incision with gentle pressure so as not to overdrive the staples deep into the dermis. The inter-staple distances were 5mm.

Subcuticular suturing

All the subcuticular sutures were continuous non locking sutures placed at the skin dermis using Ethicon Vicryl 3.0. Wound edges were gently everted, then the sutures were passed through the dermis at the wound edge to connect and pass through the contralateral dermis repeatedly until the entire wound was closed.

Application of the tissue adhesive

After subcutaneous closure, the skin edges were dried; they were approximated with non-tooth forceps. Adhesive glues (Histoacryl® by Emzor Pharmaceuticals Company) were applied gently to the wound, care was taken not to allow the adhesive to go below skin edges which could delay wound healing. When the adhesives were dry, the wounds were dressed using gauze and plaster.

All the three groups of wounds were dressed immediately after the completion of wound closure. All the subjects were prescribed analgesics and antibiotics according to departmental protocol: the antibiotics-intravenous Cefuroxime 750mg twice daily for 3 days to be changed to tablet Cefuroxime 500mg twice daily for 4 days after completion of intravenous dose Intravenous Metronidazole 500mg thrice daily for 3 days then changed to tablets metronidazole 400mg thrice daily for 4 days and intramuscular paracetamol 300mg twice daily for 3 days. All wound dressings in the 3 groups of subjects were removed on POD3. The wounds were inspected for wound breakdown and infection on (POD7). Daily dressings of all wounds found to have dehiscence or infection were done with gauze and EUSOL and the wounds were left to heal by secondary intention, and the affected subjects were prescribed analgesic (Paracetamol tablets 1gram 8 hourly daily for three days with their antibiotic extended for next five days.

Cosmetic outcome data collection

The patient and observer scar assessment scale (POSAS) was used to assess cosmetic outcomes on postoperative days (POD)10, 30 and 90 in this study. The POSAS comprises a patient scale (Appendix I) to be rated by patients and an observer scale (Appendix II) to be rated by a trained independent observer. The patient form was made of 7 questions with 6 questions

directed at the scar qualities with 6 being the lowest score obtainable and 60 being the highest. The 7th question gives the subject's overall scar assessment. Observer Scale (Appendix II) consists of 7 questions, 6 questions assess scar related parameters. The seventh question gives overall rating of the scar. Minimum score obtainable is 6 while the maximum score obtainable is 60.

In this study, a modified observer scale was used. The question concerning vascularity of the scar was removed due to expected difficulty and inconsistency of visually assessing skin vascularity in dark skinned individuals. As a result, the maximum POSAS observer scale score obtainable became 50 while the least obtainable was 5.

Data analysis was performed using IBM SPSS Software (I.B.M. Statistical Package for Social Sciences) for Windows version 26. Descriptive statistics were carried out for socio-demographic variables. Quantitative data were summarized using mean and standard deviation or median and range depending on normality of the data. Qualitative parameters were presented in frequencies and percentages. Comparisons of cosmetic outcome scores and closure times per unit length of wounds between the three groups were done using Kruskal Wallis tests. All values of $p \leq 0.05$ were considered as being statistically significant.

RESULTS

The study lasted 12 months from November 2018 to October 2019 and a total of 60 subjects were recruited. Four subjects were lost to follow up, thus, 56 subjects comprising 39 males and 17 females with age range and mean age of 18-59 years and 35±12 years, respectively, completed the study. The distribution of the subjects according to other sociodemographic variables and the study groups is presented in table 1.

Table I: Patient demographic distributions

Variables		Subcuticular	Tissue adhesive	Staple	Total	χ^2	p-value
		N (%)	N (%)	N (%)	N (%)		
Gender:	**Male**	15(26.8)	12(21.4)	12(21.4)	39(69.6)	1.23	0.54
	Female	4(7.1)	7(12.5)	6(10.7)	17(30.4)		
Age:	**≤25**	3(5.4)	4(7.1)	5(8.9)	12(21.4)	8.67	0.37
	26-30	8(14.3)	2(3.6)	2(3.6)	12(21.4)		
	31-35	1(1.8)	2(3.6)	3(5.4)	6(10.7)		
	36-40	2(3.6)	3(5.4)	3(5.4)	8(14.4)		
	41-59	5(8.9)	8(14.3)	5(8.9)	18(32.1)		
Education:	**Islamic**	2(3.6)	2(3.6)	0(0)	4(7.1)	19.13	0.001*
	Primary	7(12.5)	2(3.6)	13(23.2)	22(39.3)		
	Secondary	7(12.5)	14(25)	3(5.4)	24(42.9)		
	Tertiary	3(5.4)	1(1.8)	2(3.6)	6(10.7)		
Occupation:	**None**	2(3.6)	2(3.6)	0(1.7)	4(7.1)	7.80	0.80
	Civil Servant	3(5.4)	1(1.8)	1(1.8)	5(8.9)		
	Artisan	3(5.4)	5(8.9)	4(7.1)	12(21.4)		
	Trading	7(12.5)	6(10.7)	7(12.5)	20(35.7)		
	Housewives	2(3.6)	1(1.8)	4(7.1)	7(12.5)		
	Students	1(1.8)	3(5.4)	1(1.8)	5(8.9)		
	Retired	1(1.8)	1(1.8)	1(1.8)	3(5.4)		

**: statistically significant difference*

The wounds' lengths across all the three groups ranged from 4.50 to 12.00 cm, with a mean wound length of 8.45±2.024cm, and median length 8.00cm respectively.

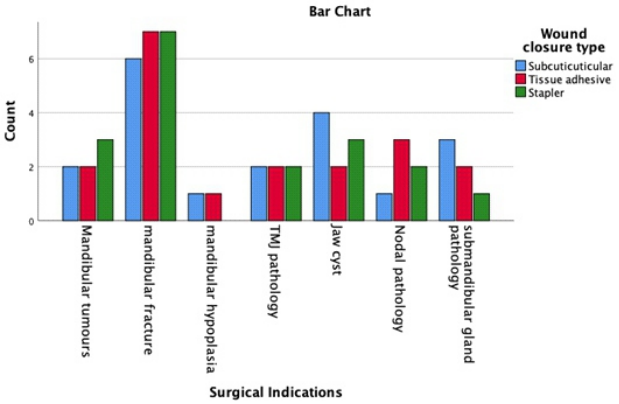

Figure 1: Surgical indication for each wound closure technique

For the patient scores, the comparative analysis showed that there was statistical significance difference (*p< 0.001* and *p=0.04*) in total scores between the wound closure techniques on POD10 and POD30, respectively. There was, however, no significant statistical difference between the patient rated outcomes of the three closure techniques on day 90.

Post-hoc analysis revealed that the significant statistical difference in total scores on POD10 was between tissue adhesive and staple groups *(p< 0.001)*, and between tissue adhesive and subcuticular suturing groups *(p=<0.001)*. On POD30, the significant statistical difference was between tissue adhesive and staple groups only *(p<0.04)*. This is shown in table II below.

Table II: Analysis of total scores of Patient scales for days 10, 30 and 90.

Days	Mean±S.D)	P value
10 days		<0.001Ж
Subcuticular	15.57±1.83	
Tissue adhesive	14.11±1.52	
Staple	16.56±1.65	
30 days		0.04Ж
Subcuticular	13.74±0.99	
Tissue adhesive	13.63±1.92	
Staple	14.72±1.45	
90 Days		0.47
Subcuticular	13.37±1.64	
Tissue adhesive	13.47±1.81	
Staple	13.89±1.53	

Ж: statistically significant difference

Regarding the observer rated outcomes, comparative analysis of the observer scores showed that there was statistically significant difference in total scores of the modified Observer scale used in this study only on POD10 ($p < 0.001$).

Post-hoc analysis showed that the statistical difference in total scores was between the tissue adhesive and staple groups*(p<0.001)* and, also, between tissue adhesive and subcuticular closure*(p<0.001)*. This is shown in table III below.

Table III: Analysis of total scores of modified Observer scale for day 10, 30 and 90

Days	Mean±SD	P value
10 day		
Subcuticular	13.95±1.72	< 0.001Ж
Tissue adhesive	12.74±0.87	
Staple	14.33±1.50	
30 days		
Subcuticular	13.73±0.99	0.12
Tissue adhesive	13.63±1.92	
Staple	14.75±1.45	
90 days		
Subcuticular	13.58±1.57	0.73
Tissue adhesive	14.05±2.09	
Staple	14.06±1.86	

Ж: statistically significant difference

Determination of Average Skin Closure Time Per Unit Wound Length

Among all the three wound closure techniques, the mean closure time per unit length (min/cm) for subcuticular suturing was the highest at 2.01±0.54min/cm, while that of tissue adhesive use was 0.45±0.65min/cm, with the least being that of stapler use at 0.18±0.03min/cm. The difference observed in skin closure time per unit length of wound across all the wound closure techniques was statistically significant ($p < 0.001$). The post-hoc analysis revealed that there was significant statistical difference among all the three techniques of closure ($p \leq 0.001$).

Complication of Wound Closure Techniques

Six subjects had wound dehiscence: all within the range of 1-3cm. Two of the subjects were from tissue adhesive group while four subjects were from the staple group.

The incidence of dehiscence among the 3 groups of subjects was analyzed using chi-square, it was not statistically significant with $p = 0.19$ and the χ^2 value of 3.21.

DISCUSSION

Scars in different location of the body are influenced by local factors ,which include mechanical forces such as skin tension that is induced by stretching, wound depth, and orientation to RSTL.[22]

Wound closure techniques have been investigated by many authors with different objectives like cosmetic outcome, cost of wound closure, incidence of complication, and speed of closure.[23-26,] The results of our final comparisons on POD90 align with the findings of Mackeen *et al,* who conducted a systematic review involving twelve publications,[27] and found no statistically significant difference in cosmetic outcomes between use of sutures and percutaneous staples. Though, some statistically significant differences were observed on comparisons of outcomes between sutures and staples in this study on POD10 and POD30, these differences disappeared as the wound matured.

According to Dowson *et al*,[28] there was no statistical significance in wound cosmesis at both 6 weeks and three months when they compared tissue adhesives with non-resorbable suture. Similar study by Brown *et al*[29] comparing tissue adhesive and suture in paediatric herniorrhaphy surgery reported no statistical significance at 6 weeks. Alicandri-Ciufelli[30] reported better scar cosmesis with subcuticular group when compared with tissue adhesive group at POD10, however, no statistical significance was seen between the groups at POD90. In our study, the subcuticular suture group had a better cosmesis in the initial POD10 when compared with tissue adhesive and staple. This disappeared at POD90 with similarity in the cosmesis between the staple, subcuticular and tissue adhesive groups like the results of Alicandri-Ciufelli.

Time per unit length is an inverse measure of speed of closure. In the present study, use of staples provided the fastest means of wound closure among the three closure techniques studied. The time per unit wound length in the study was highest with subcuticular suturing (Table III). This was followed by tissue adhesive closure, while the percutaneous staple group had the least time per unit wound length. There was statistically significant difference in time spent in wound closure per unit length across all the three types of closure ($p < 0.001$). This finding was similar to the results of Ridgway *et al*,[31] who also observed percutaneous staple closure to be faster during application when compared with tissue adhesive closure in neck wounds following thyroid surgery.

It was observed in this study that tissue adhesive closure took one-fifth of the time it took to do subcuticular suturing. This aligns with the findings of Martin,[32] who found out that the time taken to place tissue adhesive was one-third of the time it took for subcuticular suturing. The statistically significant difference in closure time between the three wound closure techniques could translate to significant difference in operating time. According to Cromi *et al*,[33] a faster closure method will generally be preferred by anaesthetists and surgeons, especially if the speed of application of the technique can be combined with safety because of much lowered incidence of needle stick injury in the staple application. Ikeako et al,[34] also confirmed that staple closure technique consumed less time than subcuticular suturing. Additionally, they showed that the increased time expended in meticulous closure of subcuticular suturing did not reflect in scars with superior cosmetic qualities.[35]

It is generally accepted that staples required less dexterity than tissue adhesive closure, while a subcuticular suturing requires meticulous attention to detail. Experience and dexterity of the surgeon with subcuticular closure technique did not reflect in faster closure time as seen in this study. This was similar to finding of Abdus-salam who used a highly experienced surgeon in the use of subcuticular closure technique.[17] A wound closure method that needs meticulousness will always take longer time irrespective of surgeons' experience.

Complication observed during the present

study was limited to wound dehiscence. Earlier studies by Abdus-salam *et al* and Figueroa *et al* also showed more wound dehiscence with staples, though with no statistical significance in incidence ($p \geq 0.05$).[17,35] Hiremath *et al*,[36] however, reported a contrary finding with higher incidence of wound dehiscence in the simple interrupted suture group when compared with the percutaneous staple group. In the same study, lower infection rate was observed in the percutaneous staple group when compared with wound closure using sutures. They argued that percutaneous staples exhibited superior resistance to infection citing an earlier experimental animal study as evidence.[36] The result of Hiremath's study differed from the findings of the present study, probably because buried subcuticular sutures were used in this study unlike the simple interrupted sutures used by Hiremath *et al*,[36] The main morbidity of the use of staple according to Mackeen *et al*,[27] is an increased likelihood of wound dehiscence which could be up to 74 percent.

The antibacterial property of tissue adhesive against gram positive bacteria like *Staphylococcus aureus* seen on skin has been documented in literature.[37,38] This antibacterial property has been demonstrated to prevent wound infection.[37] However, the absence of wound infection in the tissue adhesive group in this study could be attributed to other reasons apart from this inherent antibacterial property. This is because of a similar absence of wound infection observed in the other two study groups. The reasons for absence of wound infection in this study may, therefore, be due to adherence to standard surgical principles which include good intra-operative infection control, gentle tissue handling and aseptic post-operative wound care.

In the present study, the Observer scale was modified by excluding the vascularity item in this scale. Similar modification was done by Abdus-salam *et al*,[17] who stated that the difficulty in measuring vascularity in blacks necessitated this modification. The modification was necessary because the dark color of African subjects makes it difficult to visualize capillary refill after blanching with plexiglass.[17] However, the modification did not appear to affect the outcome of their study.

This study concludes that while percutaneous staples' use was the fastest and, hence, the most time saving among the three techniques studied, in settings with limited operation times and situations where patients are concerned about the immediate postoperative cosmesis, percutaneous staples and tissue adhesives may be respectively employed for surgical wound closures with similarly good cosmetic outcomes.

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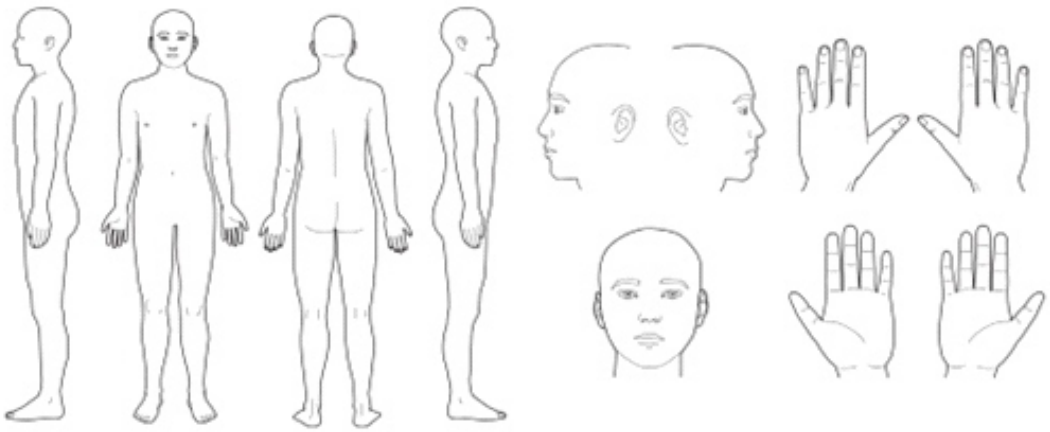
APPENDIX I: PATIENT SCALE

POSAS Patient scale

The Patient and Observer Scar Assessment Scale v2.0 / EN

Date of examination:	**Name of patient:**
Observer:	
Location:	**Date of birth:**
Research / study:	**Identification number:**



	1 = no, not at all … yes, very much = 10
HAS THE SCAR BEEN PAINFUL THE PAST FEW WEEKS?	1 2 3 4 5 6 7 8 9 10
HAS THE SCAR BEEN ITCHING THE PAST FEW WEEKS?	1 2 3 4 5 6 7 8 9 10

	1 = no, as normal skin … yes, very different = 10
IS THE SCAR COLOR DIFFERENT FROM THE COLOR OF YOUR NORMAL SKIN AT PRESENT?	1 2 3 4 5 6 7 8 9 10
IS THE STIFFNESS OF THE SCAR DIFFERENT FROM YOUR NORMAL SKIN AT PRESENT?	1 2 3 4 5 6 7 8 9 10
IS THE THICKNESS OF THE SCAR DIFFERENT FROM YOUR NORMAL SKIN AT PRESENT?	1 2 3 4 5 6 7 8 9 10
IS THE SCAR MORE IRREGULAR THAN YOUR NORMAL SKIN AT PRESENT?	1 2 3 4 5 6 7 8 9 10

	1 = as normal skin … very different = 10
WHAT IS YOUR OVERALL OPINION OF THE SCAR COMPARED TO NORMAL SKIN?	1 2 3 4 5 6 7 8 9 10

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APPENDIX II: OBSERVER SCALE

POSAS Observer scale

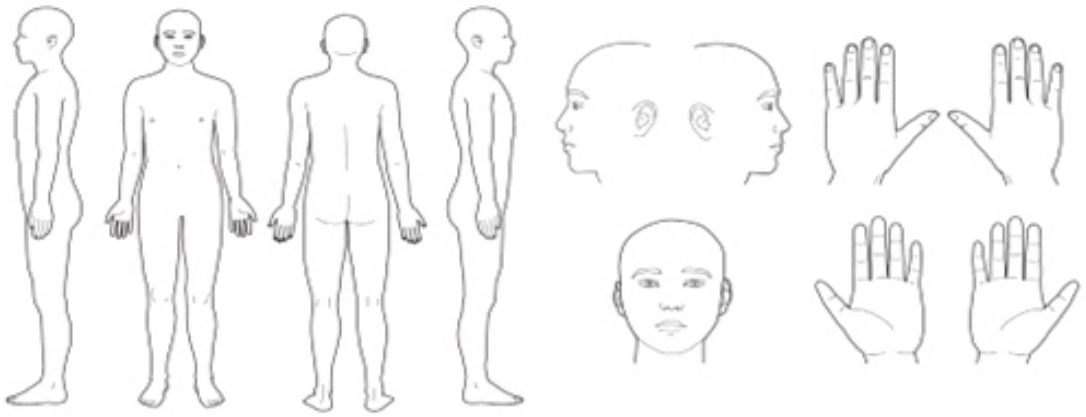
The Patient and Observer Scar Assessment Scale v2.0 / EN

Date of examination: | **Name of patient:**

Observer:

Location: | **Date of birth:**

Research / study: | **Identification number:**



1 = normal skin — worst scar imaginable = 10

PARAMETER	1	2	3	4	5	6	7	8	9	10	CATEGORY
VASCULARITY	○	○	○	○	○	○	○	○	○	○	PALE | PINK | RED | PURPLE | MIX
PIGMENTATION	○	○	○	○	○	○	○	○	○	○	HYPO | HYPER | MIX
THICKNESS	○	○	○	○	○	○	○	○	○	○	THICKER | THINNER
RELIEF	○	○	○	○	○	○	○	○	○	○	MORE | LESS | MIX
PLIABILITY	○	○	○	○	○	○	○	○	○	○	SUPPLE | STIFF | MIX
SURFACE AREA	○	○	○	○	○	○	○	○	○	○	EXPANSION | CONTRACTION | MIX
OVERALL OPINION	○	○	○	○	○	○	○	○	○	○	

Explanation

The observer scale of the POSAS consists of six items (vascularity, pigmentation, thickness, relief, pliability and surface area).
All items are scored on a scale ranging from 1 ('like normal skin') to 10 ('worst scar imaginable').
The sum of the six items results in a total score of the POSAS observer scale. Categories boxes are added for each item. Furthermore, an overall opinion is scored on a scale ranging from 1 to 10.
All parameters should preferably be compared to normal skin on a comparable anatomic location.

Explanatory notes on the items:

- **VASCULARITY** Presence of vessels in scar tissue assessed by the amount of redness, tested by the amount of blood return after blanching with a piece of Plexiglas
- **PIGMENTATION** Brownish coloration of the scar by pigment (melanin); apply Plexiglas to the skin with moderate pressure to eliminate the effect of vascularity
- **THICKNESS** Average distance between the subcutical-dermal border and the epidermal surface of the scar
- **RELIEF** The extent to which surface irregularities are present (preferably compared with adjacent normal skin)
- **PLIABILITY** Suppleness of the scar tested by wrinkling the scar between the thumb and index finger
- **SURFACE AREA** Surface area of the scar in relation to the original wound area

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APPENDIX III

PATIENT DATA SHEET

1. BIODATA

a. Subject's Number

b. sex M F

c. Age

d. occupation, (tick as appropriate)

I. Unemployed

II. Government

III. Artisan

IV. Trader

V. Housewives

VI. Students

VII. Retired

e. Date of Surgery

f. Education Qualification

I None

II Primary

III Secondary

IV Tertiary

2. CLINICALS

I Diagnosis

II. Procedure

III. Length of wound in cm

IV wound closure type. Techniques of closure (*mark as appropriate)*

1. Subcuticular Suture
2. Histocryl
3. Staple Pin

V. Time spent on closure

VII. Average Time per Length

3. POST-OPERATIVE INFORMATION (*tick as appropriate)*

I. Wound Abscess

II. Abscess: Present Not Present, Length

II. Dehiscence: Present length Not present,