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ORIGINAL PAPER

Appearance-related psychosocial distress following facial skin cancer surgery using the FACE-Q Skin Cancer

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Abstract

Over 2 million facial skin cancers occur globally each year. Facial skin cancer surgery can leave scars that may alter appearance and impact psychosocial functioning. The objective of this study is to assess patient-reported appearance-related psychosocial distress following facial skin cancer surgery, and to identify independent predictors of psychosocial impairment. This was a single-center, cross-sectional study at a tertiary care cancer center including patients who underwent dermatologic surgery on the face from March 1, 2016 to March 31, 2018. Patients completed the FACE-Q Skin Cancer Appearance-related Psychosocial Distress scale postoperatively between May 21, 2018 and October 1, 2018. Patient responses were rated on a 4-point Likert scale and converted on a scale from 0 to 100. In total, 359 patients completed the questionnaire (34.2% response rate). Overall, patients reported a low level of psychosocial distress. Patients most frequently reported items of self-consciousness, unhappiness, and insecurity < 3 months following surgery. Though psychosocial distress significantly improved over time, self-consciousness continued to be reported in the long-term postoperative period. Linear regression analysis determined that younger age, history of anxiety and/or depression, surgery on the nose, and repair by flap were independently predictive of psychosocial distress. Marginal predicted values for distress scores based on age demonstrated an indirect relationship. Patient-reported appearance-related psychosocial distress is low following facial skin cancer surgery, and report of distress decreases over time. The identified predictors of distress may be used as indicators for offering psycho-oncologic support and early interventions to improve scar appearance.

Keywords FACE-Q Skin Cancer · Patient-reported outcomes · Skin cancer surgery · Psychosocial distress

Background

Between 2 and 3 million non-melanoma skin cancers and 132,000 melanoma skin cancers occur globally each year [1]. Approximately 70–80% of skin cancers occur in the head and neck region, for which surgical excision is the standard treatment [2]. While facial skin cancer surgery can often be achieved without major functional impairment, facial skin cancers and post-surgical scars can be highly conspicuous and have a notable psychosocial impact on the patient [3–5]. Changes in facial appearance, regardless of the magnitude, can result in patient anxiety, depression, and social isolation [6].

Quality of life is one of the most important endpoints in head and neck cancer outcomes [4]. The prospect of facial scarring and disfigurement carries a substantial psychosocial burden for patients, even more so than the possibility of vision, breathing, or speech impairments following surgery [7, 8]. Despite these implications, physicians often underestimate the importance of physical appearance for patients [9]. Scars that physicians may dismiss as minor may translate to anxiety and self-consciousness for patients [10].

Patient-reported outcome measures (PROMs) are questionnaires developed with direct input from patients, and are associated with enhanced quality of life in head and neck cancer patients [11]. In addition, PROMs may enable a better understanding of the patient's perspective and improve communication [12]. The FACE-Q Skin Cancer Module was developed to assess patient-reported outcomes for facial skin cancer surgery and consists of five independently functioning scales [13, 14]. The Appearance-related Psychosocial

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Distress scale measures the psychosocial impact of facial skin cancer surgery on health-related quality of life.

Prior studies have examined psychosocial distress in skin cancer patients in the context of baseline psychosocial health [15], cancer anxiety [16], and depression [17]. Limited studies have characterized postoperative psychosocial distress in the context of appearance using a validated, skin cancer-specific scale [16]. We sought to quantify patient-reported appearance-related distress following facial skin cancer surgery using the Appearance-related Psychosocial Distress Scale and to identify contributors to psychosocial impairment. Understanding these data may help physicians improve pre-operative counseling and inform patient expectations.

Methods

Study design and data collection

The Institutional Review Board at Memorial Sloan Kettering Cancer Center approved this study. The FACE-Q Skin Cancer Appearance-related Psychosocial Distress scale was administered to patients ≥ 21 years old who underwent facial skin cancer surgery between March 1, 2016 and March 31, 2018. The study questionnaire was emailed or mailed to patients, based on their preference, and was delivered up to two additional times. Patients completed the questionnaire between May 21, 2018 and October 1, 2018. Study data were collected and managed using Research Electronic Data Capture (REDCap), a secure, web-based application that supports data capture for research studies.

Electronic medical records of study participants were reviewed to collect relevant demographic, and surgical information. Data were analyzed by demographic variables, skin cancer type, anatomic location, wound healing type, defect and repair size, and time interval between surgery and survey completion. Demographic variables included age, gender, marital status, history of anxiety, and/or depression. Skin cancers included basal cell carcinoma (BCC), squamous cell carcinoma (SCC, including in situ), and melanoma (invasive and in situ). Facial anatomic locations were grouped as forehead/eyebrow, temple, eyelid, cheek, nose, lip, chin, and ear. Wound healing types were second intention healing, primary closure, flap (including paramedian forehead flap), and graft (full thickness and skin substitutes).

Questionnaire

The Appearance-related Psychosocial Distress scale is part of the FACE-Q Skin Cancer Module, a validated patient-reported outcome measure developed for patients with facial skin cancer [18]. The scale contains eight statements regarding appearance-related psychosocial distress. Examples of questions include "I feel self-conscious about how my face looks" and "I feel anxious when people look at me." Patients responses ranged from "definitely agree" to "definitely disagree." Responses were rated on a four-point Likert-type scale and transformed to a score between 0 and 100. Higher values represent a greater severity of psychosocial distress.

Statistical analysis

The distribution of study variables was assessed using descriptive statistics and graphical methods. The dependent variable for the analysis was psychosocial distress. Univariate analyses including *t* tests and one-way ANOVAs were used to assess the associations between psychosocial distress and patient and surgical characteristics. For multivariate analysis, linear regression was used to explore the relationship between distress and patient characteristics while controlling for characteristics of the surgical procedures. To help visualize the relationship between distress and age, predictive marginal estimates plots of distress by patient age at time of the surgery were created. All analyses were performed using Stata 14.2, Stata Corporation, College Station, TX, USA.

Results

One thousand and forty-nine patients were identified. Of these patients, 359 (34.2%) completed the survey, 638 (60.8%) did not complete the questionnaire, and 52 (5.0%) declined study participation. The mean ± standard deviation (SD) age of responders was 65.1 ± 12.1 years and 50.7% ($n = 182$) were women (Table 1). The demographic information of responders was similar to that of non-responders (mean ± SD age was 65.1 ± 13.8 years and 55.2% were men). The mean time between surgery date and questionnaire completion for respondents was 58.3 ± 34.7 weeks. The distribution of responses from the time of surgery to questionnaire completion is in Table 1.

Patients reported an overall mean appearance-related psychosocial distress score of 17.3 ± 24.8. Psychosocial distress was reported by 59.2% ($n = 29$) of patients < 6 months following surgery, 49.4% ($n = 44$) of patients 6 months to < 1 year following surgery, and 40.7% of patients ($n = 87$) ≥ 1 year following surgery. Highest psychosocial distress scores were reported in the short-term (< 3 month) postoperative period (mean score 39.3), and scores significantly decreased over time (Table 1). Patients most frequently reported the items of self-consciousness, unhappiness, and insecurity < 3 months following surgery. Report of self-consciousness persisted over time.

Table 1 Comparison of patient characteristics who completed the FACE-Q Skin Cancer Appearance-related Psychosocial Distress scale ($n=359$)

Variable	*n*	Mean score (standard deviation)	*p* value
Sex			
Males	177	14.0 (23.2)	0.02
Females	182	20.2 (25.6)	
Age (years)			
< 65 years	158	22.5 (26.0)	< 0.001
≥ 65 years	201	13.0 (22.8)	
Marital status			
Married	300	17.1 (24.8)	0.92
Not married	59	17.5 (23.8)	
History of anxiety and/or depression			
No	310	15.4 (23.2)	< 0.001
Yes	49	28.6 (29.9)	
Prior facial skin cancer surgery[a]			
1	282	15.7 (24.7)	0.051
2	46	20.1 (24.3)	
3	31	26.5 (22.4)	
Wound healing type			
Second intention	28	20.6 (26.8)	0.017
Primary closure	195	13.7 (22.1)	
Flap	100	23.0 (27.5)	
Graft	36	17.2 (24.6)	
Anatomic surgery location			
Forehead/eyebrow	54	10.2 (16.1)	0.021
Temple	30	14.6 (20.0)	
Eyelid	20	14.2 (23.5)	
Cheek	103	17.5 (26.1)	
Nose	91	24.4 (28.7)	
Lip	21	20.8 (25.9)	
Chin	12	15.3 (27.1)	
Ear	28	9.1 (15.3)	
Post-operative time interval			
< 3 months	7	39.3 (22.4)	0.026
3 months to < 6 months	42	21.4 (26.5)	
6 months to < 1 year	93	19.4 (26.3)	
1 year to < 2 years	164	15.7 (23.9)	
≥ 2 years	53	11.5 (20.7)	

[a]Within 2 years of surgery date

Females, younger patients (< 65 years), history of anxiety, and/or depression were significantly associated with greater psychosocial distress (Table 1). A recent history (within 2 years) of two or more facial skin cancer surgeries was associated with greater psychosocial distress, though this relationship was not significant ($p=0.051$). Linear regression models established that younger age and history of anxiety and/or depression were independently predictive of appearance-related psychosocial distress (Table 2). Marginal predicted values demonstrated an indirect relationship between age and appearance-related distress, with higher scores in the younger cohort and lower scores in the older cohort (Fig. 1). Among anatomic surgical sites, nose location was significantly associated with, and independently predictive of psychosocial distress (mean distress score 24.4, $p=0.021$). Among repair types, flap repair was significantly associated with and independently predictive of psychosocial distress (mean distress score 23.0, $p=0.017$). In particular, patients who underwent a paramedian forehead flap repair experienced the greatest psychosocial distress (mean score 47.2). A positive correlation was identified between size of defect and degree of distress, although this result was not significant ($p=0.05$). No relationship was identified between repair size and degree of distress.

Discussion

This cross-sectional study provides long-term postoperative data regarding appearance-related psychosocial distress in the facial skin cancer population. Most patients experienced some degree of appearance-related psychosocial distress that is most notable in the short-term postoperative period. During this time, a noticeable scar, a bandage, or surgical site irregularity, such as splitting sutures, may be contribute to greater distress levels [16]. In dermatologic surgery, the vast majority of patients will heal with an aesthetically pleasing scar; however, this study shows that a proportion of patients will continue to be self-conscious ≥ 1 year after surgery. As more time elapses from diagnosis and treatment, patients may better adapt to the scar and its associated anxieties [19].

Similar to previous studies [5, 20–23], we have demonstrated that women and younger patients report greater psychosocial distress following skin cancer surgery. Women have lower skin cancer quality of life both pre- and post-operatively and greater body image distress, compared to men [24–27]. In addition, studies have shown that younger patients tend to experience greater pre-operative anxiety levels compared to older patients [23]. Aesthetic changes may impact social issues more commonly affecting younger patients, such as dating or returning to work.

Approximately 13.6% of patients reported a history of anxiety and/or depression prior to their surgeries, and this proportion is similar to that of the general U.S. population [28]. History of anxiety and/or depression was independently predictive of psychosocial distress following surgery. Previous studies have demonstrated that depression affects overall body image and perceived attractiveness [29, 30]. Even if surgeries are successful, patients with anxious or depressive qualities may not be satisfied with the outcome.

Table 2 Results from linear regression models with distress as the dependent variable and age, gender, history of anxiety and/or depression, nose location, and flap repair as the independent variables

Distress	Coefficient	*T* value	SD	*p* value	95% CI	
					Lower	Upper
Age	− 0.29	0.11	− 2.75	0.006	− 0.5	− 0.08
Gender	4.02	2.58	1.56	0.120	− 1.05	9.08
History of anxiety/depression	10.06	3.67	2.74	0.006	2.84	17.29
Nose versus all other	7.65	2.95	2.59	0.010	1.84	13.45
Flap versus all other	7.18	2.86	2.51	0.012	1.56	12.8
Constant	29.00	3.87	2.84	< 0.001	14.26	43.74

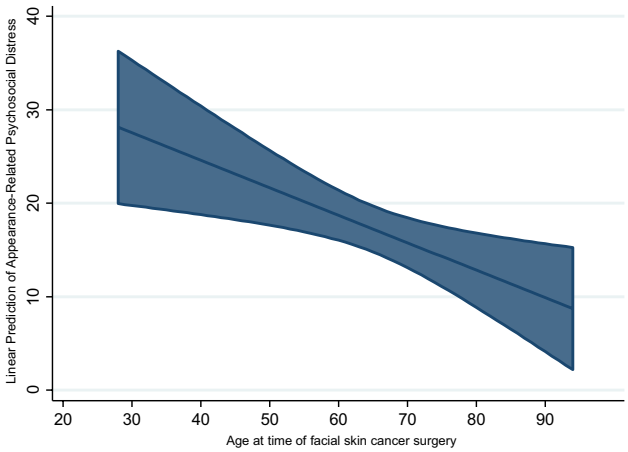

Fig. 1 Marginal predicted values for FACE-Q Skin Cancer Appearance-related Psychosocial Distress score, by age. A 95% confidence band was included to indicate the precision around the estimate

Despite these implications, a recent study suggests that 40% of dermatologic surgeons do not inquire about psychiatric histories in new patients, and 60% of dermatologic surgeons fail to identify patients with body dysmorphic disorder [31]. Active screening and management of mood disorders have an important role in tailoring counseling and setting realistic healing expectations.

The nose location and flap repair were independently predictive of postoperative distress. The nose is essential to overall facial aesthetic harmony due to its central location [32]. In addition, wounds located on the convex surfaces of the nose often heal with a noticeable scars [33]. Therefore, patients presenting with lesions on the nose may require more extensive counseling regarding short- and long-term healing expectations. Flaps are commonly performed to recreate cosmetic subunits and preserve contour and function. However, flap repairs also require greater tissue movement compared to other repair types, and are associated with greater number of adverse effects postoperatively [34], which can contribute to greater patient distress. Paramedian forehead flaps, for example, leave scars on the central forehead and nose, and were associated with the highest degree of appearance-related distress amongst repair types in this study. Similarly, a study of patients with non-melanoma skin cancer demonstrated that patients requiring more extensive reconstructions reported lower quality of life scores [21]. In this study, larger defects were associated with more distress, which may also contribute to these findings.

Addressing psychosocial distress in relation to postoperative appearance and scarring may improve outcomes following skin cancer surgery [31]. Studies have shown that high levels of appearance-related pre-operative anxiety can diminish the ability for patients to cope effectively following surgery [31, 35, 36]. Conversely, patients with better pre-operative coping ability and mental health status are more likely to have long-term satisfaction, and greater skin-related quality of life and post-operative behavioral response [37, 38].

The use of a validated PROM allows for the systematic identification of patients with psychosocial distress. The patient's perception of their aesthetic outcome can vary from the physician's view; despite a favorable appearance, a small scar can have a significant impact on the patient. However, patients may not verbally express feelings of self-consciousness and anxiety to their surgeon. PROMs enable patient feedback that can be measured and inform clinical care. Notably, during the early post-operative period (< 3 months), a PROM allows for providers to screen patients and offer patients more frequent follow-up, reassurance, and earlier intervention for scar improvement. In more severe cases or for patients with persistent distress, referral to mental health services may be warranted.

Limitations of our study include a population from a single tertiary center and cross-sectional design. Baseline psychosocial distress scores were not obtained in patients; future studies comparing pre- and post-surgical distress scores may identify thresholds that impart a greater quality-of-life impact. Due to the questionnaire-based nature of our study, selection bias may have been present. In addition, patients in each time period were distinct. Longitudinal studies may better characterize the post-operative patient experience over time. Future studies examining the association between psychosocial distress and patient scar assessment may highlight additional opportunities for counseling and intervention.

Conclusion

Appearance-related psychosocial distress has a significant impact on quality of life and is an important factor in determining facial skin cancer surgery success. A low level of appearance-related psychosocial distress is reported by 59% of patients within 6 months of surgery and persists in a proportion of patients over time. The FACE-Q Skin Cancer Appearance-related Psychosocial Distress scale can be used to identify patients at greater risk for psychosocial distress. We have identified several independent predictors of psychosocial distress, including younger age, history of anxiety and/or depression, nose location, and flap repairs.

Our findings highlight the importance of active screening of mood disorders in the skin cancer surgery population. The identified variables predicative for appearance-related psychosocial distress may be used as indicators for offering psycho-oncologic support and interventions to improve the appearance of facial scars.

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