Facial Malignancies in Patients Referred for Mohs Micrographic Surgery: A Retrospective Review of the Impact of Hair Growth on Tumor and Defect Size

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PRACTICE **POINTS**

- In our study, men with cutaneous tumors who had facial hair exhibited larger tumors, required more Mohs layers, and had a larger defect size compared to men who do not have any facial hair growth.
- Both patients and dermatologists should have a high index of suspicion for any concerning lesion contained within skin underlying facial hair to ensure prompt diagnosis and treatment of cutaneous tumors.

There is a lack of data characterizing tumors located within male facial hair subunits and determining if terminal hair growth obscures tumor detection, thus leading to a delay in diagnosis. Our objective was to evaluate the difference in cutaneous tumor size in men who had facial hair compared to men without facial hair. This retrospective chart review analyzed Mohs micrographic surgery cases of tumors located within facial hair subunits from January 2015 to December 2018 at The University of North Carolina at Chapel Hill. Patients and dermatologists should maintain a high index of suspicion for any concerning lesion contained within skin underlying facial hair to ensure prompt diagnosis and treatment of cutaneous tumors.

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Male facial hair trends are continuously changing and are influenced by culture, geography, religion, and ethnicity.[1] Although the natural pattern of these hairs is largely androgen dependent, the phenotypic presentation often is a result of contemporary grooming practices that reflect prevailing trends.[2] Beards are common throughout adulthood, and thus, preserving this facial hair pattern is considered with reconstructive techniques.[3,4] Male facial skin physiology and beard hair biology are a dynamic interplay between both internal (eg, hormonal) and external (eg, shaving) variables. The density of beard hair follicles varies within different subunits, ranging between 20 and 80 follicles/cm^2. Macroscopically, hairs vary in length, diameter, color, and growth rate across individuals and ethnicities.[1,5]

There is a paucity of literature assessing if male facial hair offers a protective role for external insults. One study utilized dosimetry to examine the effectiveness of facial hair on mannequins with varying lengths of hair in protecting against erythemal UV radiation (UVR). The authors concluded that, although facial hair provides protection from UVR, it is not significant.[6] In a study of 200 male patients with actinic keratosis on the head and face, Liu et al[7] demonstrated that sheltering mustaches, defined as greater than 9 mm in length, reduced the risk for developing an actinic keratosis on the lower lip by a factor of 16 (P=.0003).

We sought to determine if facial hair growth is implicated in the diagnosis and treatment of cutaneous malignancies. Specifically, we hypothesized that the presence of facial hair leads to a delay in diagnosis with increased subclinical growth given that tumors may be camouflaged and go undetected. Although there is a lack of literature, our anecdotal evidence suggests that male patients with

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facial hair have larger tumors compared to patients who do not regularly maintain any facial hair.

Methods

We performed a retrospective chart review following approval from the institutional review board at The University of North Carolina at Chapel Hill. We identified all male patients with a cutaneous malignancy located on the face who were treated from January 2015 to December 2018. Photographs were reviewed and patients with tumors located within the following facial hair-bearing anatomic subunits were included: lip, melolabial fold, chin, mandible, preauricular cheek, buccal cheek, and parotid-masseteric cheek. Tumors located within the medial cheek were excluded.

Facial hair growth was determined via image review. Because biopsy photographs were not uploaded into the health record for patients who were referred externally, we reviewed all historical photographs for patients who had undergone prior Mohs micrographic surgery at The University of North Carolina at Chapel Hill, preoperative photographs, and follow-up photographs as a proxy to determine facial hair status. Postoperative photographs taken within 2 weeks following surgery were not reviewed, as any facial hair growth was likely due to disinclination on behalf of the patient to shave near or over the incision. Age, number of days from biopsy to surgery, pathology, preoperative tumor size, number of Mohs layers, and defect size also were extrapolated from our chart review.

TABLE 1. Primary Outcomes: Cutaneous Tumors in Patients With Facial Hair vs Patients Without Facial Hair

	Any Facial Hair (n=171)	No Facial Hair (n=336)	*P* Value
Mean age (SD), y	67.5 (13.8)	74.0 (11.1)	<.001
Median no. of days from biopsy to surgery	43.0	44.0	NA
Facial hair type, n (%)			
Beard	81 (47)	NA	NA
Mustache	51 (30)	NA	NA
Goatee	39 (23)	NA	NA
Tumor pathology, n (%)			
Basal cell carcinoma	86 (50)	149 (44)	.35
Squamous cell carcinoma	52 (30)	88 (26)	.39
Squamous cell carcinoma in situ	11 (6)	42 (13)	.05
Melanoma	1 (1)	9 (3)	.11
Melanoma in situ	14 (8)	35 (10)	.45
Other	7 (4)	13 (4)	.90
Anatomic location, n (%)			
Lip	46 (27)	52 (15)	.01
Melolabial fold	7 (4)	5 (1)	.07
Chin	8 (5)	28 (8)	.14
Mandible	22 (13)	75 (22)	.02
Preauricular cheek	49 (29)	95 (28)	.94
Buccal cheek	29 (17)	59 (18)	.88
Parotid-masseteric cheek	10 (6)	22 (7)	.77
Mean preoperative tumor size (SD), cm	1.40 (0.92)	1.22 (0.65)	.03
Mean no. of Mohs layers (SD)	1.53 (1.10)	1.33 (0.62)	.03
Mean defect size (SD), cm	2.18 (1.25)	1.98 (0.90)	.05

Abbreviations: SD, standard deviation; NA, not applicable.

Statistical Analysis—Summary statistics were applied to describe demographic and clinical characteristics. An unpaired 2-tailed *t* test was utilized to test the null hypothesis that the mean difference was zero. The χ^2 test was used for categorical variables. Results achieving $P<.05$ were considered statistically significant.

Results

We reviewed medical records for 171 patients with facial hair and 336 patients without facial hair. The primary outcomes for this study assessed tumor and defect size in patients with facial hair compared to patients with no facial hair (Table 1). On average, patients who had facial hair were younger (67.5 years vs 74.0 years, $P<.001$). The median number of days from biopsy to surgery (43.0 vs 44.0 days) was comparable across both groups. The majority of patients (47%) exhibited a beard, while 30% had a mustache and 23% had a goatee. The most common tumor location was the preauricular cheek for both groups (29% and 28%, respectively). The mean preoperative tumor size in the facial hair cohort was 1.40 cm compared to 1.22 cm in the group with no facial hair ($P=.03$). The mean number of Mohs layers in the facial hair cohort was 1.53 compared to 1.33 in the group with no facial hair ($P=.03$). The facial hair cohort also had a larger mean postoperative defect size (2.18 cm) compared to the group with no facial hair (1.98 cm); however, this finding was not significant ($P=.05$).

We then stratified our data to analyze only lip tumors in patients with and without a mustache (Table 2). The mean preoperative tumor size in the mustache cohort was 1.10 cm compared to 0.82 cm in the group with no mustaches ($P=.046$). The mean number of Mohs layers in the mustache cohort was 1.57 compared to 1.42 in the group with no mustaches ($P=.43$). The mustache cohort also had a larger mean postoperative defect size (1.63 cm) compared to the group with no facial hair (1.33 cm), though this finding also did not reach significance ($P=.13$).

Comment

Our findings support anecdotal observations that tumors in men with facial hair are larger, require more Mohs layers, and result in larger defects compared with patients who are clean shaven. Similarly, in lip tumors, men with a mustache had a larger preoperative tumor size. Although these patients also required more Mohs layers to clear and a larger defect size, these parameters did not reach significance. These outcomes may, in part, be explained by a delay in diagnosis, as patients with facial hair may not notice any new suspicious lesions within the underlying skin as easily as patients with glabrous skin.

Although facial hair may shield skin from UVR, we agree with Parisi et al[6] that this protection is marginal at best and that early persistent exposure to UVR plays a much more notable role in cutaneous carcinogenesis. As

TABLE 2. Secondary Outcomes: Lip Tumors in Patients With a Mustache vs Patients Without a Mustache

	Mustache (n=30)	No Mustache (n=52)	*P* Value
Mean age (SD), y	65.6 (14.1)	74.5 (10.9)	<.001
Median no. of days from biopsy to surgery	50.5	43.0	NA
Tumor pathology, n (%)			
Basal cell carcinoma	15 (50)	26 (50)	1.00
Squamous cell carcinoma	12 (40)	14 (27)	.31
Squamous cell carcinoma in situ	2 (7)	10 (19)	.15
Melanoma in situ	1 (3)	2 (4)	.91
Anatomic location, n (%)			
Upper lip	14 (47)	31 (60)	.44
Lower lip	16 (53)	21 (40)	.40
Mean preoperative tumor size (SD), cm	1.10 (0.67)	0.82 (0.40)	.046
Mean no. of Mohs layers (SD)	1.57 (0.86)	1.42 (0.67)	.43
Mean defect size (SD), cm	1.63 (0.96)	1.33 (0.58)	.13

Abbreviations: SD, standard deviation; NA, not applicable.

more men continue to grow facial hairstyles that emulate historical or contemporary trends, dermatologists should emphasize the risk for cutaneous malignancies within these sun-exposed areas of the face. Although some facial hair practices may reflect cultural or ethnic settings, the majority reflect a desired appearance that is achieved with grooming or otherwise.

Skin cancer screening in men with facial hair, particularly those with a strong history of UVR exposure and/or family history, should be discussed and encouraged to diagnose cutaneous tumors earlier. We encourage men with facial hair to be cognizant that cutaneous malignancies can arise within hair-bearing skin and to incorporate self–skin checks into grooming routines, which is particularly important in men with dense facial hair who forego regular self-care grooming or trim intermittently. Furthermore, we urge dermatologists to continue to thoroughly examine the underlying skin, especially in patients with full beards, during skin examinations. Diagnosing and treating cutaneous malignancies early is imperative to maximize ideal functional and cosmetic outcomes, particularly within perioral and lip subunits, where marginal millimeters can impact reconstructive complexity.

Conclusion

Men with facial hair who had cutaneous tumors in our study exhibited larger tumors, required more Mohs layers, and had a larger defect size compared to men without any facial hair growth. Similar findings also were noted when we stratified and compared lip tumors in patients with and without mustaches. Given these observations, patients and dermatologists should continue to have a high index of suspicion for any concerning lesion located within skin underlying facial hair. Regular screening in men with facial hair should be discussed and encouraged to diagnose and treat potential cutaneous tumors earlier.

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