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The Demographics of Patients with Skin Cancer who Underwent Surgery in Diyarbakır and Performed Surgical Techniques

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Abstract

Objective: The major factor for developing malignant skin cancers is sunlight exposure. This study aimed to evaluate the demographics of patients with skin cancers who underwent surgery in Diyarbakır where the population is exposed to more sunlight than most other Turkish cities.

Methods: The medical records of patients who underwent surgery for malignant skin cancer excision between 2011 and 2016 were searched using University Hospital's patient database program. Data about patients' demographics, cancer features, and the surgical techniques performed were collected.

Results: Over a 5-year period, 190 patients underwent surgical excision. The male to female ratio was 1.56, and the mean age was 65.8 ± 15.7 (range, 20-94) years. The most common skin cancer was basal cell carcinoma (n=138, 72.7%), followed by squamous cell carcinoma (n=45, 23.7%) and malignant melanoma (n=5, 2.6%). The most common surgery was primary excision, which was performed in 90 of 190 patients (47.36%); tissue reconstruction with a skin graft or flap surgery was required for the remaining 100 (52.63%), showing a significant difference (p<0.001).

Conclusion: Basal cell carcinoma is the most common skin cancer, and less than half of the patients sought treatment immediately after they recognized the lesion. The public should be educated about skin cancers to increase early diagnosis and encourage timely treatment, thereby decreasing morbidity and mortality from skin cancer.

Keywords: Skin cancer; basal cell carcinoma; squamous cell carcinoma; skin cancer surgery; sunlight exposure

Diyarbakır ve Çevresinde Deri Kanseri Nedeniyle Ameliyat Edilen Hastaların Demografik Özellikleri ve Uygulanan Cerrahi Teknikler

Öz

Amaç: Deri kanseri oluşumuna neden olan en önemli etken güneş ışığına maruziyettir. Bu çalışma, yerel halkın Türkiye'nin çoğu ilinden daha fazla güneş ışığına maruz kaldığı Diyarbakır'da deri kanseri nedeniyle ameliyat olan hastaların demografik özelliklerini incelemeyi amaçlamaktadır.

Yöntemler:2011 ile 2016 yılları arasında deri kanserinin eksizyonu amacıyla ameliyat edilen hastaların tıbbi kayıtları, Üniversite Hastanesi tıbbi otomasyon program kullanılarak tarandı. Hastaların demografik özellikleri, deri kanserlerinin özellikleri ve uygulanan cerrahi tekniklere ait bilgiler toplandı.

Bulgular: Beş yıldan fazla bir sürede, 190 hasta ameliyate dildi. Erkek/kadın oranı 1,56 ve ortalama hasta yaşı 65,8 ± 15,7 (20-94 arası) yıldı. Deri kanserinin hastalar tarafından farkedilmesiyle tedavi için başvuru arasında geçen zaman ortalama 24.5 aydı (1-180ay). En sık görülen deri kanseri bazal hücreli karsinomken(n = 138, %72,7),bunu skuamöz hücreli karsinom (n= 45, %23,7) ve malignmelanom (n=5, %2,6) takip etmekteydi. En sık gerçekleştirilen cerrahi yöntem, 190 hastanın 90 tanesinde (%47.36) uygulanan tümöreksizyonu ve primer deri onarımıyken, geri kalan 100 hastada (%52.63) deri grefti, flep ya da combine cerrahi ile doku rekonstrüksiyonu gerekti. Primer onarım ile diğer cerrahi tekniklerin sayıları arasında istatistiksel olarak anlamlı derecede birfark vardı (p<0.001).

Sonuç:Bazal hücreli karsinom en sık görülen deri kanseri olup hastaların sadece yarıdan daha azı lezyonu fark eder etmez tedavi için başvurmaktadır. Toplum, erken teşhis oranını arttırmak ve deri kanserlerinin neden olduğu morbiditeyi azaltmak için deri kanserleri hakkında eğitilmeli ve zamanında tedavi için cesaretlendirilmelidir.

Anahtar Kelimeler: Deri kanserleri, bazal hücreli karsinom, deri kanseri cerrahisi, güneş ışığına maruziyet.

INTRODUCTION

Malignant skin cancers are classified as non-melanoma skin cancers (basal cell carcinoma and squamous cell carcinoma) and malignant melanoma. The most common skin cancer is basal cell carcinoma (BCC), and it accounts more than 75% of all skin cancers[1,2]. BCC grows slowly over time, and its metastasis risk can be overlooked (<0.005%)[1]. Squamous cell carcinoma (SCC) is the second most common skin cancer (20%), but it metastasizes to regional lymph nodes at a rate of 2-5%[2]. Although malignant melanoma (MM) is very rare compared to BCC and SCC, its regional lymph node metastases rate is reportedly 23%[3], and it is responsible for the majority of the deaths resulting from skin cancers in the United States of America[4].

The incidence of malignant skin cancer has increased in recent decades. Although there are many common and distinct risk factors for developing skin cancers (including Fitzpatrick skin type I or II, familial skin cancer history, male gender, smoking, having premalignant skin lesions such as actinic keratosis or dysplastic nevus, genetic disorders, and immune suppression), sun exposure is acknowledged as the major risk factor for developing skin cancer. Chronic and cumulative exposure to UVA and UVB rays cause skin cancers to develop, and the prevalence of skin cancer varies according to geographic district[2]. The patients enrolled in this study live in Diyarbakır, which receives significant sunlight for three-quarters of the year and where the majority of its population work in agriculture. Traditional herbal remedies are also common, and most of the patients with skin cancer try handmade pomade or drugs before visiting a medical doctor.

Surgical interventions have increased with skin cancer prevalence and reducing postoperative morbidity is increasingly important[5]. Tumor size is the main factor in determining surgery type and postoperative morbidity affects

patients' quality of life. Delaying the onset of treatment allows the skin cancer to grow, which disfigures aesthetic appearance, increases the difficulty of surgical excision, and raises the risk of metastases. Therefore, increasing public awareness about skin cancer is the key factor in preventing malignant skin cancers and surgery-related morbidities.

This study aimed to evaluate the demographics of skin cancer patients in the southeast region of Turkey and review how tumor size related to different surgical treatments.

METHODS

A retrospective analysis of patients who underwent malignant skin cancer excision was performed using University Hospital's medical database program. A total of 205 patients were operated on by the same surgeon and confirmed by pathology to have malignant skin cancers. The medical records were reviewed, and data about the patient (gender, age, job, and lifestyle), tumor (tumor type, localization size, existence of distance metastases), and surgical technique were recorded.

All the patients were operated on using local or general anesthesia. The surgical interventions were divided into four different techniques depending on the type of tissue defect closure: primary closure, skin graft, flap closure, and mixed (both skin graft and flap).

As BCC and SCC account for almost all skin cancers, these two common tumors were compared. The differences in age and tumor size of the patients who had BCC and SCC were expressed as the mean ± standard derivation, and Student's t-test was used to account for the difference in mean values. A Chi-square test was used to determine whether the tumor type (BCC and SCC) differed with gender and age. The incidences of different surgical techniques were evaluated using the Kruskal-Wallis test. The statistical analysis was performed using SPSS software version 15.0 for Windows (SPSS, Inc., Chicago) and p-values<0.05 were accepted as statistically significant.

Table 1: Demographics ofthe patients with basal cell carcinoma and squamous cell carcinoma

Demographics	Basal Cell Carcinoma	Squamous Cell Carcinoma	Statistical Significance
Total number of patients	138	45	p<0.05*
Age of patients (mean± SD),(years)	64.1 ± 16.2	72.9 ± 12.3	p<0.01**
Mean dimensions of the excised skin cancer (cm)	1.24 x 1.54	2.24 x 2.96	p<0.01**
Meansurfacearea of theexcisedskincancer (cm^2)	7.38	8.17	p<0.01**
Most common performed surgical technique	Primaryclosure, 47.1%	Primaryclosure, 26.8%	p>0.05¶
Mean interval between recognition of initial lesion and treatment (months)	35.4	23.4	p<0.05*
Localization of skin cancer	Face, n=114 (90.5%)	Face, n=35 (79.5%)	N/P
Most common facial localization	Nose, 31.5%	Lowerlip17.1%	N/P

*Statistically significant; **Statistically highly significant; ¶ not statistically significant; N/P; Not performed

Figure 1. a) A 74-year-old women presented with a large BCC that extended from the right frontal area through the upper and lateral region of her orbita. The patient had a 12-year history of skin cancer, which grew slowly over the years. The main reason for seeking medical treatment was the insistence of family members; indeed, the patient did not want to have surgery at first but then accepted. **b)** The soft tissue defect after the BCC was excised. Due to the tumor's large size, the flap surgery was combined with a skin graft to cover the bones exposed after tumor excision. **c)** a 7 x 5.5 cm BCC was excised completely within 1-cm of normal skin **d)** Despite achieving tumor eradication with clear margins, upper eyelid retraction and disfiguring of the patients caused serious postoperative morbidity.

RESULTS

Of the 205 patients, 15 had cancers other than skin cancers, and this group was named the skin-affected cancer group (metastasis of other tumors, raised from tissue under the skin, tumors invaded skin). The most common tumor types in this group were Kaposi Sarcoma (n=4, 26.6%) and dermatofibrosarcoma protuberans (n=3, 20.0%).

Of the remaining 190 patients who had malignant skin cancers, 116 (61%) were male and 74 (39%) were female. The mean age of the patients was 65.8 ± 15.7 (range, 20-94) years. The male to female ratio was 1.56; there was male dominance. Seventy-six percent of the patients worked in agriculture and animal husbandry. These patients regularly wear a puşi (a traditional cloth resembling a scarf that covers the head and some areas of the face) or broad-brimmed hat to protect against sunlight. Of the 190 malignant skin cancers, 138 were BCC (72.7%), 45 were SCC (23.7%), 4 were MM (2.1%), and 3 were basosquamous carcinoma (1.58%) (Graphic 1). The soft tissue defects resulting from surgery were closed primarily in 85 patients (44.7%), using flap tissue in 45 patients (23.7%), skin grafted in 44 patients (23.2%), and using both skin graft and flap in 16 patients (8.4%) (Graphic 2).
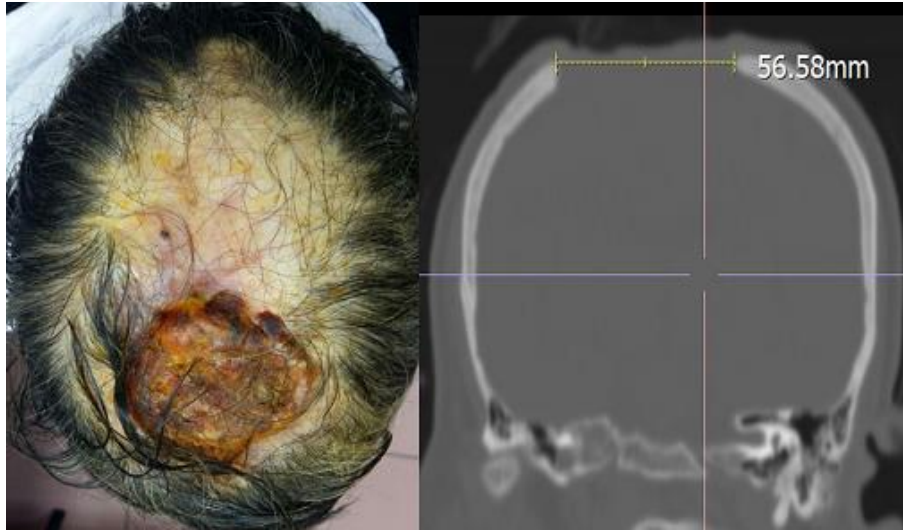
Figure 2. a) A 50-year-old woman presented with an 8 x 10 cm squamatedtumoral mass over her scalp. Her medical history revealed a scalp burning in childhood, and the pathologic examination revealed that the lesion was SCC (also named as Marjolin ulcer). The lesion had existed for more than 14 years, and the patient did not seek any treatment during this period. **b)** A computed tomography revealed a bone defect in 4.5 cm in diameter, and the durameterwas invaded. The patient did not accept surgical treatment and was told that the skin cancer is life threatening.

Figure 3. a) A 52-year-old women with a 4-year history of malign melanoma on her left cheek applied for treatment. Tumor excision and reconstruction with a cheek rotation flap were planned. **b)** Tissue defect after tumor excision. **c)** Immediate postoperative photo of the patient. **d)** Three weeks after surgery with an acceptable aesthetic outcome.

The authors compared the patients with BCC and SCC, and the results are summarized in Table 1. The mean age was 64.1 ± 16.2 (range 20-93) years in the patients with BCC and 72.9 ± 12.3 (range 44-94) years in the patients with SCC; the differences were statistically significant (p<0.01). The mean dimension of the excised tumor was 1.24 x 1.54 cm (with a mean surface area of 7.38 cm2) for the BCC patients and 2.24 x 2.96 cm (with a mean surface area of 8.17 cm2) for the SCC patients. The mean tumor dimension was significantly larger in SCC patients than in BCC patients (p<0.01). Primary closure was the most common surgery for BCC patients at a rate of 47.1%, whereas it was only utilized for 28.6% of SCC patients. Although the differences between the same surgical techniques in the treatment of BCC and SCC patients are not statistically significant, the data reveal that the primary closure rate decreased in SCC patients due to the larger tumor sizes. The mean intervals between the recognition of a skin lesion and seeking medical care were as follows: 24.5 months (range, 1-180 months) for patients with BCC and SCC; 35.4 months (range, 4-180 months) for patients with only BCC; and 23.4 months (range, 1-120 months) in patients with only SCC. The results show that the time between recognizing the initial lesion and seeking medical treatment was significant longer in the patients with BCC (p<0.05).

Pathologic examination of the BCC specimens identified the subtype of only 18 out of 138 BCC patients; the most common subtype was nodular. The SCC specimens were classified in 30 patients as follows: well differentiated in 16 patients (53.3%); moderately differentiated in 8 patients (26.7%); and poorly differentiated in 6 patients (20.0%).

Information about tumor localization was available in the medical records for 126 of the 138 BCC patients and 44 of the 45 SCC patients. Of the 126 BCC patients, 114 (90.5%) had facial lesions, whereas only 12 (9.5%) developed on another part of the body (Table 1). The face region was also the most affected area in SCC patients; 35 of 44 (79.5%) tumors were located on the face. The nose was the most common area for facial BCC lesions, with a rate of 31.5%. Among SCC lesions, 17.1% were located on the lower lip, which was the most common area for developing SCC.

Some cases are shown in Figures 1-3.
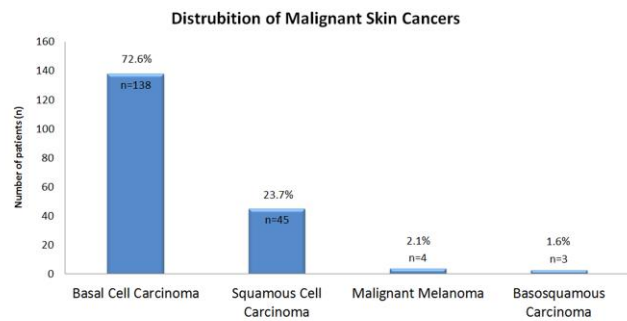
Graphic 1. Distribution of skin cancers
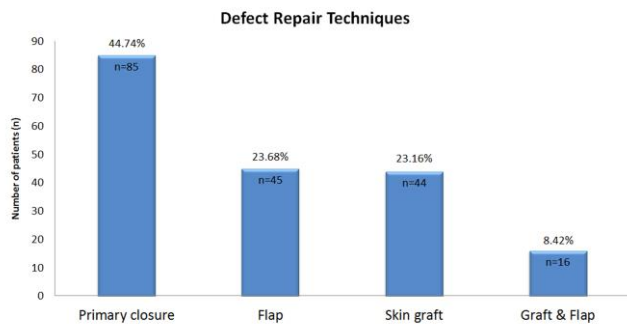
Graphic 2. Distribution of surgical techniques in skin cancer treatments.

DISCUSSION

It is well known that extensive exposure to UVA and UVB rays from the sun is a significant risk factor for developing skin cancer. As life expectancy and therefore sun exposure increases, skin cancers have become more common. According to a report from the Health Ministry of the Turkish Republic published in

2009, skin cancer was the fifth most common cancer in Turkish men and the fourth most common cancer in Turkish women.[6]Currently, published literature about skin cancer prevalence in Turkey reflects local but not country-wide data[7-10]. Arıca et al. reported that skin cancer was the most common cancer type in the southern Turkish city of Hatay, with a rate of 27.7%, and this study stated that the city's excessive exposure to sunlight was the main reason for high prevalence of skin cancer[7]. Skin cancer was also identified as the most common cancer in Şırnak (43.4%) and Diyarbakır (15.4%)[8-9]. Turkey's lack of a regular reporting system for cancer cases may be a reason for the wide range of skin cancer prevalence in different Turkish cities.

Non-melanoma skin cancers (NMSCs) such as BCC and SCC reportedly account for 95% of all malignant skin cancers in worldwide[1]. This report noted that 96.4% of all cases were NMSCs, a proportion slightly higher than in the US. Aktürket. al reported that of the 372 patients with skin cancers in Kocaeli, 88.6% were NMSCs[10]. Although the rates of NMSCs in Kocaeli and Diyarbakır differ, it is clear that NMSCs are, as expected, the most common skin cancers[9,10].

According to published literature, climate type is directly correlated to skin cancer incidence, and people living in sunnier climates are at greater risk of developing skin cancers than those living in less temperate climates[11,12]. This study investigated the demographic features of skin cancer patients living in Diyarbakır, where the average maximum temperature in the summer is 36.7°C, with an average of 12 hours of sunlight[13]. A study from Dicle University published in 2007 by Özekinci, showed that skin cancer was the most common cancer type in Diyarbakır, with a rate of 15.4%[9]. Although this article did not focus on the cancer case distribution in Diyarbakır, Özekinci et al.'s report supports this paper's assertion that skin

cancers might be the most common cancers in cities with climates similar to Diyarbakır[9].

Job type is an important factor to consider in determining how much sunlight exposure a person receives because people who work outdoors are subjected to more sun exposure than those who work indoors. A study from New Zealand revealed that farmers are exposed to six to eight times more UV light than indoor workers[14]. This study collected patients' occupations from hospital databases and phone interviews. The collected job data for 138 patients (82 men and 56 women) with NMSC showed that 87 (63%) were farmers and 14 worked outdoors (10.1%).

Wearing sunglasses, long trousers, and clothes covering the skin are the most suitable and effective way to provide sun protection[15,16]. In their clinical practice, the authors asks the patients with skin cancers whether they used anything to protect their skin from the damaging effects of sunlight. The farmer patients said that they tried to work in the early morning or late afternoon; however, that is not possible all the time. These patients also said that they did not use sun protective cream; they did, however, wear a puşi (a traditional cloth resembling a scarf that covers the head and some areas of the face) or broad-brimmed hat. The public, especially farmers and outdoor workers, should be informed about the damaging effects of sunlight and instructed on how protecting skin from the sun can prevent skin cancer.

The risk for developing malignant skin cancer increases with age; most skin cancers are diagnosed in patients in their 50s and 60s[1,2]. Corroborating these expectations, this report's findings show that the mean age of the malignant skin cancer patients was 65.87 ± 15.75 (range: 20-94). Significantly, the mean age of patients with SCC was approximately nine years older than patients with BCC (p<0.01). However, as it contradicts general

literature knowledge about mean age of the patients with malignant skin cancers; Yang et al. reported that 105 patients with early-onset BCC were diagnosed at a mean age of 44.2 years17 which was quite low compared to this study's BCC patients, whose mean age at diagnosis was 64.6 years. This data suggests that increasing patients' awareness about skin cancer can decrease the mean age at initial diagnosis. Some patients enrolled in the present study had a history of skin cancer of more than 20 years, and this fact is disturbing in terms of the country's protective public health.

The most commonly reported skin cancer sites were the head and neck region[7,11]. This information is compatible with the present study, which showed that of the 170 malignant skin cancer locations, 150 (88.2%) were located on different facial regions. The nasal region was the most common site for BCC, and the lower lip was the most common site for SCC. Although significantly less common than the face, the neck (BCC) and scalp (SCC) were the second most common areas. The location of the malignancies shows that uncovered body parts exposed to sunlight have the greatest risk of developing skin cancers.

Previous studies about skin cancers mostly have focused on their prevalence and location as well as the patients' gender and age distribution. In contrast, this report also evaluates the tumor size and surgical treatment of the malignant skin cancers. Like all cancer types, early diagnosis and timely treatment are key factors for eradicating skin cancer and reducing postoperative morbidity in cases requiring surgery. The cancer size at the initial examination provides insight into patients' awareness of malignant skin cancers, and unfortunately, many patients had skin cancers that were already significant in size. Some cases had been diagnosed as other skin diseases or given inappropriate traditional medical creams or herbal remedies. In such cases, the cancer tissue grew and invaded underlying anatomic structures or metastasized into lymph nodes and other body parts. In advanced cases, the growth or spread of skin cancer causes serious deformities including orbital exenteration, extremity amputation, or even death due to metastases.

Tumor size is also an important factor in determining the most appropriate surgical technique. If the cancer dimension is small enough, surgical excision and primary closure of the defect can be sufficient, but reconstruction techniques can be requiredfor larger tumors. The cancer dimensions are also related to tumor stage and survival expectation. The mean tumor size was 1.54 x 2.9 cm (mean surface area = 4.71 cm2) in BCC patients, whereas it was 2.24 x 2.95 cm (mean surface area = 8.36 cm2) in SCC patients. Some patients had a history of cancer going back more than 15 years. In this study, only 85 of 190 patients underwent tumor excision and primary defect closure; the remaining 105 patients underwent tissue defect reconstruction, a rate of 55.3%. Of the 45 SCC patients, there were regional lymph node metastases and 3 distant metastases, a rate of 16.3%. This study also showed that, given the mean duration for seeking medical treatment after recognizing the cancer lesion, the people living in Diyarbakır do not have enough information about skin cancer.

CONCLUSION

Skin cancers are most commonly diagnosed in patients in their 60s, and BCC is the most common skin cancer. It is highly important to educate the public about potential skin cancers and the importance of seeking medical treatment promptly. Early diagnosis and surgical intervention can diminish post-surgical morbidities that affect the quality of life. Teaching Turkish citizens how to protect themselves from sun exposure, particularly in cities receiving extensive sunlight, is important in reducing the prevalence of skin cancers.

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