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*Original Article*

# A Retrospective Study of Demographic, Clinical, and Histopathological Profiles of Cutaneous Tumors

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**ABSTRACT**

**Background:** In 2018 skin cancer was the fourth most common malignancy in Indonesia. However, the cutaneous tumor profile in our institution has not been studied. **Purpose:** To evaluate profiles of cutaneous tumors in the Dermatology and Venerology Outpatient Clinic, Dr. Soetomo General Hospital, Surabaya, Indonesia. **Methods:** This analytical retrospective study recorded data of new cutaneous tumor patients during 2019-2020. The exclusion criteria was incomplete data of medical record. Medical records and photograph databases from 2019-2020 were assessed for demography, clinical features, histopathological examination, and final diagnosis. Statistical analysis was performed using the Chi-square ( 2) or Fisher exact test. **Result:** There were 379 new cutaneous tumor patients at the Dermatology and Venereology Outpatient Clinic in 2019-2020. Overall, there were more female patients (53.7%) with those aged 0-45 years old (70.4%). Cutaneous tumors more commonly presented as papular (50.4%), multiple (56.5%), nonpigmented (58.3%), asymptomatic lesions (62.5%), with time from onset of 0-24 months (66.2%) and location on the head and neck (61.2%). Benign cutaneous tumors showed similar findings. Malignant cutaneous tumors showed significant differences, including predominantly male sex, age above 45 years old with manifestation of nodular, solitary, pigmented, and easily bleeding lesions. Malignant tumors were less common (6.9%). The most common malignant tumor was BCC. The most common benign and overall cutaneous tumor was seborrheic keratosis. **Conclusion:** Cutaneous tumors are presented across genders and ages, showing heterogenous clinical manifestations. The time from onset of malignant and benign cutaneous tumors was similar. However, differences were seen in demographic profiles and the majority of clinical features. BCC is the most common malignant cutaneous tumor. Seborrheic keratosis is most common benign and overall cutaneous tumor.

**Keywords:** cutaneous tumors; histopathology; clinical; human & health; demographic study.

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## BACKGROUND

Cutaneous tumors can be defined as skin lumps or overgrowth of some or all components of the skin.[1,2] They can be divided into malignant or benign tumors according to their growth pattern.[2]

In 2018, skin cancers were reported as the fourth most common malignancies in Indonesia.[3] The most common skin cancers were basal cell carcinoma (BCC) (65.5%), squamous cell carcinoma (SCC) (23%) and malignant melanoma (7.9%).[1] Studies in Manado reported that the prevalence of malignant cutaneous tumors was 1,7% (from 2008-2010) and benign cutaneous tumors was 15,7% (from 2009-2011).[1,2]

Cutaneous tumors are commonly diagnosed clinically and histopathologically. As of now, there has been no study conducted regarding the profile of cutaneous tumors in our institution. Therefore, this study aimed to evaluate the demographic, clinical, and

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histopathological profiles of cutaneous tumors. This study also compared the demographic and clinical profile of malignant and benign cutaneous tumors.

## METHODS

This was an analytical retrospective study. Data of medical record from 1 January 2019 to 31 December 2020, were obtained and photograph database of patients was recorded in the Dermatooncology and Dermatosurgery Division of Dermatology and Venereology Outpatient Clinic, Dr. Soetomo General Academic Hospital, Surabaya, Indonesia.

**Table 2.** Clinical profiles of new cutaneous tumor patients

| Clinical features | Malignant | (%) | Benign | (%) | Total | (%) | p-value |
|---|---|---|---|---|---|---|---|
| Primary lesions[§] | | | | | | | |
| Macule | 3 | (11.5%) | 7 | (2.0%) | 10 | (2.6%) | 0.0249[f]* |
| Papule | 0 | (0.0%) | 191 | (54.1%) | 191 | (50.4%) | <0.0001* |
| Nodule | 14 | (53.8%) | 114 | (32.3%) | 128 | (33.8%) | 0.0426* |
| Plaque | 10 | (38.5%) | 37 | (10.5%) | 47 | (12.4%) | 0.0004[f]* |
| Vesicle | 0 | (0.0%) | 5 | (1.4%) | 5 | (1.3%) | 1.0000[f] |
| Number of lesions | | | | | | | |
| Single | 26 | (100.0%) | 139 | (39.4%) | 165 | (43.5%) | <0.0001* |
| Multiple | 0 | (0.0%) | 214 | (60.6%) | 214 | (56.5%) | |
| Color of lesion | | | | | | | |
| Pigmented | 21 | (80.8%) | 125 | (35.4%) | 146 | (38.5%) | <0.0001* |
| Nonpigmented | 4 | (15.4%) | 217 | (61.5%) | 221 | (58.3%) | |
| Not evaluated | 1 | (3.8%) | 11 | (3.1%) | 12 | (3.2%) | |
| Rolled border | 7 | (26.9%) | 0 | (0.0%) | 7 | (1.8%) | 0.0000[f]* |
| Translucency | 2 | (7.7%) | 6 | (1.7%) | 8 | (2.1%) | 0.0982[f] |
| Erosion | 9 | (34.6%) | 5 | (1.4%) | 14 | (3.7%) | 0.0000[f]* |
| Ulcer | 16 | (61.5%) | 2 | (0.6%) | 18 | (4.7%) | 0.0000[f]* |
| Crusts | 21 | (80.8%) | 8 | (2.3%) | 29 | (7.7%) | 0.0000[f]* |
| Scales | 4 | (15.4%) | 11 | (3.1%) | 15 | (4.0%) | 0.0142[f]* |
| Telangiectasia | 2 | (7.7%) | 0 | (0.0%) | 2 | (0.5%) | 0.0045[f]* |
| Time of onset | | | | | | | |
| Mean (months) | 23.3 | | 44.6 | | 43.2 | | |
| ≤24 months | 19 | (73.1%) | 232 | (65.7%) | 251 | (66.2%) | 0.5839 |
| >24 months | 7 | (26.9%) | 121 | (34.3%) | 128 | (33.8%) | |
| Subjective symptoms[§] | | | | | | | |
| Easily bleeding | 14 | (53.8%) | 10 | (2.8%) | 24 | (6.3%) | 0.0000[f]* |
| Pruritus | 12 | (46.2%) | 55 | (15.6%) | 67 | (17.7%) | 0.0005[f]* |
| Pain | 10 | (38.5%) | 64 | (18.1%) | 74 | (19.5%) | 0.0234* |
| Purulent | 1 | (3.8%) | 4 | (1.1%) | 5 | (1.3%) | 0.3004[f] |
| Oozing | 0 | (0.0%) | 4 | (1.1%) | 4 | (1.1%) | 1.0000[f] |
| Asymptomatic | 4 | (15.4%) | 233 | (66.0%) | 237 | (62.5%) | <0.0001* |
| Location | | | | | | | |
| Head and neck | 23 | (88.5%) | 209 | (59.2%) | 232 | (61.2%) | 0.0060* |
| Trunk | 0 | (0.0%) | 42 | (11.9%) | 42 | (11.1%) | 0.0963[f] |
| Lower extremity | 1 | (3.8%) | 54 | (15.3%) | 55 | (14.5%) | 0.1493[f] |
| Upper extremity | 2 | (7.7%) | 48 | (13.6%) | 50 | (13.2%) | 0.5536[f] |
| Histopathological examination | | | | | | | |
| Yes | 11 | (42.3%) | 35 | (9.9%) | 46 | (12.1%) | - |
| No | 15 | (57.7%) | 318 | (90.1%) | 333 | (87.9%) | |
| Total | 26 | (100.0%) | 353 | (100.0%) | 379 | (100.0%) | |

[§]One patient can present with more than one primary lesion or subjective symptoms, *p-value less than 0.05, [f]Fisher-exact test

**Table 1.** Demographic profiles of new cutaneous tumor patients

| Demographic features | Malignant | (%) | Benign | (%) | Total | (%) | p-value |
|---|---|---|---|---|---|---|---|
| Sex | | | | | | | |
| Male | 14 | (53.8%) | 106 | (30.0%) | 120 | (46.3%) | 0.0213* |
| Female | 12 | (46.2%) | 247 | (70.0%) | 259 | (53.7%) | |
| Age | | | | | | | |
| Mean (years) | 61.3 | | 37.0 | | 38.7 | | |
| ≤45 | 3 | (11.5%) | 226 | (64.0%) | 229 | (70.4%) | <.0001* |
| >45 | 23 | (88.5%) | 127 | (36.0%) | 150 | (39.6%) | |
| Total | 26 | (100.0%) | 353 | (100.0%) | 379 | (100.0%) | |

*p-value less than 0.05 (Chi-square test)

**Table 3.** Profiles of malignant cutaneous tumors

| Diagnosis | Histopathologically confirmed | | Total | |
|---|---|---|---|---|
| | N | % (out of 11) | N | % (out of 26) |
| Basal cell carcinoma (BCC) | 7 | (63.6%) | 18 | (69.4%) |
| Squamous cell carcinoma (SCC) | 1 | (9.1%) | 2 | (7.7%) |
| Malignant melanoma | - | - | 2 | (7.7%) |
| Bowen's disease | 1 | (9.1%) | 1 | (3.8%) |
| Kaposi's sarcoma | 1 | (9.1%) | 1 | (3.8%) |
| Extranodal natural killer/T cell lymphoma | 1 | (9.1%) | 1 | (3.8%) |
| Keratoacanthoma | - | - | 1 | (3.8%) |
| Total | 11 | (100.0%) | 26 | (100.0%) |

**Table 4.** Profiles of benign cutaneous tumors

| Diagnosis | Histopathologically confirmed | | Total | |
|---|---|---|---|---|
| | N | % (out of 35) | N | % (out of 353) |
| Seborrheic keratosis | 6 | (17.1%) | 87 | (24.6%) |
| Verruca vulgaris | 2 | (5.7%) | 60 | (17.0%) |
| Corns and calluses | 1 | (2.9%) | 38 | (10.7%) |
| Melanocytic nevi | 3 | (8.5%) | 28 | (7.9%) |
| Milia | - | - | 26 | (7.3%) |
| Fibroepithelial polyp | 2 | (5.7%) | 17 | (4.8%) |
| Epidermoid cysts | 2 | (5.7%) | 15 | (4.2%) |
| Keloid | - | - | 11 | (3.1%) |
| Pyogenic granuloma | 3 | (8.5%) | 11 | (3.1%) |
| Xanthelasma | - | - | 11 | (3.1%) |
| Neurofibroma | 2 | (5.7%) | 8 | (2.3%) |
| Molluscum contagiosum | - | - | 7 | (2.0%) |
| Lymphangioma | 4 | (11.3%) | 6 | (1.7%) |
| Syringoma | - | - | 5 | (1.4%) |
| Hypertrophic scar | - | - | 3 | (0.8%) |
| Pilomatrixoma | 2 | (5.7%) | 2 | (0.6%) |
| Hemangioma | 1 | (2.9%) | 2 | (0.6%) |
| Epidermal nevus | 1 | (2.9%) | 2 | (0.6%) |
| Lipoma | - | - | 2 | (0.6%) |
| Solar lentigo | 1 | (2.9%) | 1 | (0.3%) |
| Sebaceous gland hyperplasia | 1 | (2.9%) | 1 | (0.3%) |
| Steatocystoma | 1 | (2.9%) | 1 | (0.3%) |
| Trichoepithelioma | 1 | (2.9%) | 1 | (0.3%) |
| Giant cell tumor of tendon sheath | 1 | (2.9%) | 1 | (0.3%) |
| Lymphomatoid papulosis | 1 | (2.9%) | 1 | (0.3%) |
| Blue nevus | - | - | 1 | (0.3%) |
| Nevus of Ota | - | - | 1 | (0.3%) |
| Nevus sebaceous | - | - | 1 | (0.3%) |
| Tuberous sclerosis | - | - | 1 | (0.3%) |
| Dermatofibroma | - | - | 1 | (0.3%) |
| Port-Wine stain | - | - | 1 | (0.3%) |
| Total | 35 | (100.0%) | 353 | (100.0%) |

The inclusion criteria was new patients with cutaneous tumors. The exclusion criteria was incomplete medical record data. Gender, age, clinical features, histopathological findings, and final diagnosis were all collected. Differences between nominal variables were analyzed using a Chi-square ($\chi^2$) or Fisher exact test. A significant difference was considered if the p-value was less than 0.05. This research has been approved by the Ethical Committee at the Dr. Soetomo General Hospital with a reference number of 0569/LOE/301.4.2/IX/2021.

## RESULT

From 2019 to 2020, our institution's Dermatology and Venereology Outpatient Clinic there were 6896 new patients, which 465 patients of whom were managed by the Dermatooncology and Dermatosurgery Division. Among 465 patients, there were 379 cutaneous tumor patients and 86 patients with skin aging, acne scars, ingrowing nails, and other non-tumor diseases requiring surgical management. Among 379 cases of cutaneous tumors, 26 (6.9%) were malignant and 353 (93.1%) were benign. The prevalence of cutaneous tumors in general was 5.5%. The prevalence of benign and malignant cutaneous tumors were 5.1%, and 0.4%, respectively. In general, there were more females and patients aged 45 years and below. Cutaneous tumors often present as papules, multiple lesions, and nonpigmented lesions. Rolled border, translucency, erosion, ulcer, crusts, scales, and telangiectasia were present in a few cases. Lesions were more commonly asymptomatic, located on the head and neck, and with a duration of 24 months or less.

Males and those over the age of 45 were more likely to develop malignant cutaneous tumors, which manifested as a macule, nodule, or plaque, single lesions, pigmented lesions with rolled borders, erosions, ulcers, crusts, scales, telangiectasia, easily bleeding, pruritus, pain, and location on the head and neck (p-value 0.05). Benign cutaneous tumors more commonly occured among women and those aged under 45 years old and were presented as papules, multiple lesions, nonpigmented lesions, and those without subjective symptoms (p-value <0.05). Tables 1 and 2 show the demographic and clinical profiles of patients with cutaneous tumors divided according to the nature of the tumors.

Histopathology examinations were performed in both groups, but more often in malignant cutaneous tumors. There were 46 cases examined histopathologically, among which 11 were malignant and 35 were benign cutaneous tumors. The most common tumors in general and among benign cutaneous tumors were seborrheic keratosis. The most common malignant cutaneous tumors were basal cell carcinoma. Tables 3 and 4 show the histopathological features and diagnosis of malignant and benign cutaneous tumors.

## DISCUSSION

This study described the profiles of patients with cutaneous tumors. The prevalence of cutaneous tumors in general was 5.5%, while the prevalence of benign and malignant cutaneous tumors were 5.1%, and 0.4%, respectively. The prevalence of cutaneous tumors in general has not been reported. However, studies in Manado showed a prevalence of 1.7% (from 2008-2010) and 15.7% (from 2009-2011) for malignant and benign cutaneous tumors, respectively.[1,2] The lower prevalence of cutaneous tumors in this study may be due to decreased outpatient visits during the Coronavirus Disease 19 (Covid-19) pandemic in 2020. Malignant tumors comprised 6.9% of all cutaneous tumor patients. This is similar to a study in Manado, which malignant tumors occurred in 6.1-12.3% of patients with cutaneous tumors.[1]

There was female predominance in general and among benign cutaneous tumor patients in particular. A similar result was found in a study of benign cutaneous tumors in Manado.[2] On the contrary, there was a slight male predominance among those with malignant cutaneous tumors. A similar result was found in a study of malignant cutaneous tumors in India.[4] Sex predominance in cutaneous tumors may be due to difference in sun exposure, outdoor occupation or activities and health-seeking behavior. The reason for overall female predominance could be that female patients were more concerned about changes in their skin and sought treatment earlier. The male patients were more reluctant to seek treatment until the cutaneous lesions became symptomatic or worsened, as in malignant cutaneous tumors.[1,5–7]

There were more patients aged under 45 years in general and among benign cutaneous tumor patients, and the opposite finding was found among malignant cutaneous tumor patients. Similar findings were reported by studies in Manado and North India.[1,2,4] Age above 45 years is associated with increased cumulative ultraviolet radiation, accumulation of DNA mutations, reduced DNA repair capacity, and reduced immunity. It is associated with an increased number of UV-associated malignant cutaneous tumors such as BCC, SCC, keratoacanthoma, and Bowen's disease, which constituted the majority of malignant cutaneous tumors in this study. Seborrheic keratosis, the most common benign cutaneous tumor in this study, is also associated with UV exposure and presents more often among the

elderly.[8] However, the predominance of ages of 45 years old and below among benign cutaneous tumors in this study reflected the high overall number of tumors presenting at birth (congenital), childhood, adolescence or young adulthood, such as melanocytic nevi and verruca vulgaris.[4,9,10] Corns and calluses, the third most common benign tumors in our study, are associated with pressure and friction, which may be more common in physically active young and working adults as in our study.[11]

In our study, lesions most often presented as papules. Similar findings, were reported by a study in Mumbai.[12] All malignant cutaneous tumors showed single lesions, while the majority of benign cutaneous tumors showed multiple lesions. This is in contrast to a study in Turkey where benign cutaneous tumors were mostly solitary.[13] This may be due to a difference in benign tumor compositions. Benign cutaneous tumors, which generally present with multiple lesions, such as seborrheic keratosis, corns, milia, fibroepithelial polyps, and xanthelasma, were more frequent in our study.

To the best of the authors' knowledge, there were no studies yet comparing the overall frequency of pigmented and nonpigmented cutaneous tumors. In this study, there were more nonpigmented than pigmented lesions which may be related to the type of tumors. The most common malignant tumors were BCC, and all cases of BCC showed pigmentation. This is in accordance with the higher rate of pigmented BCC among Asians.[14] This may account for the higher number of pigmented lesions observed among malignant tumors. Most of the benign tumors were found to be nonpigmented. Melanocytic nevi and seborrheic keratosis, which are among the most common pigmented tumors, represented less than 50% of benign tumors in our study.[15] Seborrheic keratosis may also be nonpigmented.[16] The majority of other benign tumors are nonpigmented, which may explain the observed predominance of nonpigmented lesions among benign tumors.

In this study, rolled borders and telangiectasia were not frequently observed, all of which were found in BCC. Rolled borders and telangiectasia are known to be characteristic findings in BCC, which explains their observed predominance among malignant tumors. However, these findings were harder to see in pigmented BCC or in darker skin type.[14] This may account for the small numbers of these clinical findings in our study.

Translucency, erosion, ulcers, crusts, and scales were also observed in both malignant and benign cutaneous tumors, but they were found higher among malignant tumors. Translucency is commonly seen in BCC and lymphangioma.[14,17] The low number in this study may be due to the difficult visualization among pigmented BCC and the small number of lymphangiomas. Erosion, ulcers and crusts were formed by the loss of frail necrotic tissue. This tissue results from tissue ischemia and cellular death due to the inability of angiogenesis to sustain the rapidly growing tumors.[18] Malignant tumors grow more rapidly than benign tumors.[2,18] Therefore, erosion, ulcers and crusts were expected to be significantly more common among malignant tumors, as was seen in this study.

Most lesions were observed to be asymptomatic in general and among benign cutaneous lesions in particular. However, among malignant cutaneous tumors, easily-bleeding lesions were the most common subjective symptoms. As previously stated, bleeding in malignant cutaneous tumors can be attributed to frail necrotic tissue and ulceration.[18] This may also be due to blood vessels formed by angiogenesis being haphazardly connected and leaking easily.[19]

In this study, cutaneous tumor patients often had a time from onset of 24 months or less, which may be correlated with rapid growth. Similar findings were found in China among malignant cutaneous tumors.[20] Many benign tumors also showed rapid growth with a shorter time from onset, such as verruca vulgaris and pyogenic granuloma.[9,21]

The most common locations of cutaneous tumors detected were the head and neck, similar to studies in India.[4,12] A high frequency of cutaneous tumors in this study, such as BCC, SCC, Bowen's disease, and seborrheic keratosis, are tumors related to sun exposure. Therefore, they are often presented on head and neck, which are the most sun-exposed area of the body.[22] Facial lesions are also cosmetically unpleasant, which may lead patients to seek treatment.[10] The proportion of BCC, SCC, and Bowen's disease among malignant tumors (80.8%) was also greater compared to the proportion of seborrheic keratosis (24.6%) among benign tumors, which explains the significantly higher proportion of malignant cutaneous tumors located on the head and neck compared to benign cutaneous tumors found in this study.

In this study, histopathological examination was only performed in 12.1% of patients. This may be due to higher number of benign tumors which can be diagnosed clinically. Histopathological examinations were only performed for suspected malignant tumors or atypical benign tumors.[16,23] The most common malignant tumor was BCC, and the most common benign tumors were seborrheic keratosis followed by verruca vulgaris. These findings were similar to other studies in Indonesia.[1,2,24,25]

The limitation of this retrospective study is the lack of risk factors analysis of cutaneous tumors, such as sun exposure, which were not recorded in the medical record. Further prospective studies to evaluate risk factors for cutaneous tumors are needed.

In conclusion, our study showed that cutaneous tumors presented across genders and ages, showed heterogeneous clinical manifestation. However, a predominance of female sex, age below 45 years old, papular and nodular lesions, and locations on the head and neck area were observed. Other clinical manifestations may be related to the type and nature of cutaneous tumors. Malignant cutaneous tumors were less common. BCC was the most common malignant cutaneous tumor, while seborrheic keratosis was the most common benign and overall cutaneous tumor.

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