Original Articles

Pilomatricoma revisited

Ratnayake RMP¹, Liyanage RLPR², Rambukwella IK³

Abstract

Objective: To reassess diagnosed cases of pilomatricoma for presence of other matrical tumours, secondary changes and obtain related demographic data.

Method: The histopathology reports and slides of thirty one diagnosed pilomatricoma cases were reassessed for the presence of other matrical tumours, tumour location and presence of secondary changes including, pattern of calcification, presence of pigmentation, mitosis, osseous metaplasia, secondary suppuration, presence of integral cystic structure, proportion of ghost and basophilic cells and giant cell tissue reaction.

Results: Twenty five (80.6%) patients were under 20 years of age. Twenty three (74.2%) patients were females. The site of occurrence varied. The diagnosis of pilomatricoma was confirmed and retained in 23. Three and five cases were redesignated as matricoma and pigmented pilomatricoma respectively. The presence of secondary features also varied.

Conclusion: It is essential to look for the presence of additional features besides the diagnostic features of a pilomatricoma so as to give the appropriate name to the entity.

Key words: Pilomatricoma, matrical tumour, matricoma

Introduction

Pilomatricoma (Calcifying epithelioma of Malherbe) is a benign cutaneous tumour which is derived from the matrical cortex of the hair follicle. There are other closely related tumours of similar origin namely, matricoma, pigmented pilomatricoma, melanocytic matricoma, proliferating pilomatricoma and pilomatrical carcinoma. These may be misdiagnosed as pilomatricoma. The two basic histological components of the pilomatricoma are basophilic cells and ghost (shadow) cells. The basophilic cells have relatively uniform nuclei and scanty basophilic cytoplasm. The shadow cells are in masses and show ghost outlines. They appear eosinophilic and may be keratinised. The central unstained area of the

¹ Sirimavo Bandaranaike Specialised Children Hospital, Peradeniya, Sri Lanka

^{2,3} Department of Oral Pathology, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka.
Correspondence: Ratnayake RMP, Sirimavo Bandaranaike Specialised Children Hospital, Peradeniya, Sri Lanka. e-mail: palnuwan@hotmail.com

shadow cells represents the area of the nucleus (1,2,3,4,5,6,7). The differentiating histological features of pilomatricoma and matricoma are, architecture, arrangement of tumour cell clusters, presence of integral cystic structure, percentage of matrical and ghost cells and subcutaneous infiltration (3, 4). The occurrence of pigmentation is due to stromal macrophages with melanin, melanin pigmentation of the basophilic or shadow cells and proliferation of melanocytes within the lesion. (5,6,7,8,9).

Objective

To reassess diagnosed cases of pilomatricoma for presence of other matrical tumours, secondary changes and document related demographic data.

Materials and methods

The histopathology reports and slides of thirty one cases of diagnosed pilomatricoma were reassessed for the presence of other matrical tumours, tumour location and presence of secondary changes including, pattern of calcification, presence of pigmentation, mitosis, osseous metaplasia, secondary suppuration, presence of integral cystic structure, proportion of ghost and basophilic cells and giant cell tissue reaction.

Results

The different types of matrical tumours and the age distribution are shown in table 1. The male:female ratio was 1:2. The anatomical distribution of the tumours is shown in table 2. One case showed extension into the subcutis, while the other 30 tumours were located in the dermis and none showed epidermal connection. Twenty one (67%) pilomatricomas and two pigmented pilomatricomas showed

calcification of the ghost cells (Fig1). Calcification was seen in the keratin layer in one and in the stroma in two cases (Fig2).

Age range (years)	Pilomatricoma	Matricoma	Pigmented pilomatricoma
0-10	05	00	00
11-20	13	03	04
21-30	04	00	01
>30	01	00	00
Total	23	03	05

Table 1. Types of matrical tumours and age distribution

Site	Pilomatricoma	Matricoma	Pigmented pilomatricoma
Head and neck region	09	02	02
Upper extremities	10	01	02
Chest and back	01	0	0
Lower extremities	01	0	0

Table 2. Anatomical distribution of the tumours

Six pilomatricomas had no calcification. Five were identified as pigmented pilomatricomas in view of the pigmentation of the shadow cells (Fig 3). In six cases of pilomatricomas, the pigmentation was due to stromal melanophages. Out of twenty six pilomatricomas, two showed mitotic activity exceeding 10/10HPF. Osseous metaplasia of the stroma was noted in three pilomatricomas (Fig 4). Two tumours revealed suppuration. All matricomas and pigmented pilomatricomas were solid tumours. Three pilomatricomas had integral cystic structures. Giant cell reaction was present in all cases.

Discussion

A study by Moehlenbeck FW showed that nearly 60% of the patients with pilomatricomas were less than 20 years of age (10). The majority (25, 80.6%) of the patients in this study were under 20 years of age. Sex predilection is not

Fig 1. Calcification of ghost cells(H&EX40)

Fig 2. Stromal Calcification (H&EX40)

Fig 3. Pigmented pilomatricoma(H&EX40)

Fig 4. Osseous metaplasia(H&EX40)

described for this tumour (1,2,3). However, in our series the majority (23, 74.2%) of patients were females. Matrical tumours are commonly seen in the head and neck region and upper extremities, as was highlighted in this series. With regard to the secondary changes present in the tumours, the shadow cells tend to undergo dystrophic calcification with time and appear as large amorphous basophilic islands. Calcification can be present in different locations within the tumour and should be looked for at these sites. The pilomatricomas with pigmentation in this series, had only stromal melanophages and thus could not be included in the pigmented pilomatricoma group. A melanocytic matricoma can be diagnosed by the presence pigmentation which

is due to proliferation of melanocytes within the cell islands. Melan A is required to confirm the presence of melanocytes. In this series the matricomas were amelanotic and hence Melan A was not done. Although there was a high mitotic activity in two cases, other malignant features of pilomatrical carcinoma were not present and these were diagnosed as benign pilomatricoma. However, close follow up of these patients should be advised even though they occur in younger age groups since it is known that high mitotic activity may be seen in some of the pilomatricomas and these mitoses are commonly seen in basophilic cells (7). The suppuration present was probably secondary to superadded infection. No organisms were demonstrable. The literature describes

pilomatricoma as a cystic lesion, but in this series only three cases showed cystic areas (2,3,4). This is one of the features that should be evaluated when designating a tumour as pilomatricoma since matricomas are mostly solid tumours devoid of cystic areas (2,3). Giant cell reaction to dead keratinocytes (ghost cells) was a consistent feature in all cases. It is important to assess the matrical tumours for secondary features as there are different histological revisited entities based on the presence of secondary features. If the lesion is pigmented it is essential to look for the cause of pigmentation. Increased mitotic activity can be seen even in a benign pilomatricoma. Therefore it is important to assess other associated features before labelling it as a pilomatrical carcinoma.

Acknowledgement

The authors acknowledge Dr. CSP Sosai, Consultant Histopathologist, Provincial General hospital, Badulla for providing the cases.

References

1. Philip E Leboit, Gunterberg, David Weedon, Alain Sarasin Pathology and Genetics of skin tumours, WHO classification of skin tumours. WHO Publications 2006; Vol 6: 153-155.
2. Kaddu S, Soyer HP, Hödl S, Kerl H. Morphological stages of pilomatricoma. American Journal of Dermatopathology August 1996; 18 (4): 333-8.
3. Carlson JA, Healy K, Slominsky A et al. Melanocytic matricomas: a report of two cases of a new entity. American Journal of Dermatopathology 1999; 21: 344-349.
4. Kaddu S, Soyer HP, Cerroni L, Salmhofer W, Hödl S. Clinical and histological spectrum of pilomatricoma in adults. International Journal of Dermatology October 1994; 33(10): 705-8.
5. Hardisson D, Linares MD, Cuevas-Santos J, Contreras F. Pilomatrix carcinoma, a clinicopathological study of six cases with review of articles. American Journal of Pathology October 2001; 23(5): 394-401.
6. Kaddu S, Soyer HP, Wolf IH, Kerl H. Proliferating pilomatricoma, A histopathological simulator of matrical carcinoma. Journal of cutaneous pathology (abstract) April 1997; 24(4): 228-34.
7. Ben Tallon, Lorenzo Cerroni. Where pigmented pilomatricoma and melanocytic matricomas collide. American Journal of Dermatopathology 2010; 32(8): 769-773.
8. Cartaginense F, Sidoni A. Melanocytic matricomas, Report of a further case with clinicopathological and immunohistological findings, differential diagnosis and review of the literature. Histopathology June 2010; 25(6): 713-7.
9. Islam MN, Bhattacharyya I, Proper SA, Glanz SM, Vega JM, Hassanein AM. Melanocytic matricomas, distinctive

clinicopathology entity. Dermatological Surgery July 2007;33(7): 857-63.

10. Mohelenbec FW. Pilomatrixoma (Calcifying epithelioma) A Statistical Study. Archives of Dermatology 1973;108(4):532-534.