Original Article

Histopathological spectrum of scalp tumors: Analysis with review of literature

Monica Kumbhat, Leena Dennis Joseph[1], B. Subalakshmi[1], V. Vidhya[1]

Department of Pathology, Amrita Institute of Medical Sciences, Kochi, Kerala, [1]Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India

Abstract

Purpose/Background: The scalp is the part of the body, which frequently presents with a wide variety of lesions, which may range from congenital, inflammatory, post traumatic, and neoplastic. Swellings and cysts are common occurrences. Both benign and malignant tumors are located in the scalp and correct diagnosis is needed for appropriate management.

Materials and Methods: This is a retrospective study, where we reviewed surgically excised swellings in the scalp, over a duration of 6 years. The data were obtained from the records in pathology department, in a tertiary care hospital in South India and clinical inputs were obtained from the hospital records. These were categorized primarily into benign and malignant lesions. The benign lesions were further classified as cystic lesions, vascular lesions, epidermal proliferations, and skin adnexal tumors. The malignant lesions were sub categorized as primary or secondary (metastatic).

Results: One hundred cases of histopathologically proven diverse cases of scalp swellings were included. Majority of them were benign, accounting for 77% with rest of them being malignant (23%). Among these 100 cases, 99 cases primarily originated in the scalp and only one case was a secondary tumor. Pilar cysts accounted for about 18 cases, of which 6 cases showed calcification. Vascular tumors and skin adnexal tumors played a major role. The most common malignant tumor was squamous cell carcinoma. Excision with clear margins was the mode of treatment for majority of the cases, with follow-up oncologist referral, when required.

Conclusions: Recognition of the correct diagnosis aids in appropriate management of the patient, allaying the fears and concerns of the patient.

Keywords: Benign, cysts, malignant, scalp, tumors

Address for correspondence: Dr. Leena Dennis Joseph, Department of Pathology, Sri Ramachandra Institute of Higher Education and Research, Chennai - 600 116, Tamil Nadu, India.
E-mail: leenadj@gmail.com

Submitted: 12-Dec-2020, **Accepted:** 01-Jan-2021, **Published:** 28-May-2021

INTRODUCTION

Most of these lesions in scalp, present with a swelling, painful, or painless. The inflammatory lesions may range from primary scalp diseases such as tinea capitis, traction alopecia, folliculitis keloidalis nuchae, and folliculitis decalvans. It can also be a part of a systemic involvement, as seen in atopic dermatitis, seborrheic dermatitis, psoriasis, lichen planus, etc.[1] Benign lesions

Access this article online	
Quick Response Code:	Website: www.ijhnp.org
	DOI: 10.4103/JHNP.JHNP_14_20

How to cite this article: Kumbhat M, Joseph LD, Subalakshmi B, Vidhya V. Histopathological spectrum of scalp tumors: Analysis with review of literature. Int J Head Neck Pathol 2019;2:25-8.

which present as swellings, are mainly trichilemmal cysts, dermoid cyst, epidermal inclusion cysts, lipoma, and capillary hemangiomas. Trichilemmal cyst and epidermal cysts are the causes for the lumps in the scalp in majority of the cases.

Among the malignant tumors which affect the scalp, squamous cell carcinoma, sebaceous carcinoma, and metastasis from other primary tumors are more commonly seen. Exact histopathological diagnosis is mandatory for the appropriate management of the patient.

The aim of this study was to analyze the histopathology of surgically excised scalp lesions and to see their clinicopathological correlations.

MATERIALS AND METHODS

This is a retrospective study, where we reviewed surgically excised swellings in the scalp, over a duration of 6 years from 2012 to 2017. The data were obtained from the records in the department of pathology in a tertiary care hospital in South India. The clinical inputs were obtained from the hospital data. The clinical data including age range, gender distribution, lesion localization, and lesion characteristics were noted. The swellings were categorized primarily into benign and malignant lesions. The benign lesions were further classified as cystic lesions, vascular lesions, epidermal proliferations, and skin adnexal tumors. The malignant lesions were subcategorized as primary or secondary (metastatic).

RESULTS

We studied 100 cases of histopathologically proven diverse cases of scalp swellings in the department of pathology, in a tertiary care hospital, between January 2012 and December 2017.

In our study, the age of the patients ranged from 3 years to 80 years. The highest incidence was noted in the age group of 61–70 years (19%), followed by the age group of 21–30 years (18%). We also found that scalp swellings occurred predominantly in men (52%) as compared to women (48%) with male to female ratio 1.08:1 [Table 1].

Out of 100 cases, majority of them were benign, accounting for 77 cases (77%) with rest of them being malignant 23 cases (23%). Among these 100 cases, 99 cases primarily originated in the scalp and only one case was a secondary tumor that metastasized from ribs. Benign cases showed a variety of lesions categorized based on the site of origin, common morphological features, and most common benign pilar cysts which accounted for about 18 cases, of which 6 cases showed calcification [Table 2].

Next, the most commonly encountered category was vascular lesions that comprised about 16 cases, of which 13 cases were benign and 3 cases were of malignant angiosarcoma [Figure 1]. All the benign cases were diagnosed as lobular capillary hemangioma, with one case showing ulceration.

Adnexal tumors consisted of 16 cases accounting for 16% of the total cases. Among them, 15 cases were benign, wherein pilomatrixoma [Figure 2] and nodular hidradenoma were most common, comprising five cases each. There was also one case each of eccrine poroma, Syringocystadenoma papilliferum, cylindroma, and steatocystoma simplex. One case was a mixed adnexal tumor or chondroid syringoma. Single case of hidradenocarcinoma was also noted.

There were three cases of proliferative trichilemmal tumor among the benign cases. Spindle cell lesions consisted of 7 cases of which 2 cases were of neurofibroma, 2 cases of schwannoma, and one case of dermatofibroma was seen. There were two other cases which were broadly reported as spindle cell lesions due to lack of immunohistochemical support.

A total of 23 malignant cases were noted, of which 22 cases were of primary origin and one was a secondary

Table 1: The demographic profile of our patients

Demographic details	*n*
Age (years)	3-80
Males	52
Females	48
Male:female ratio	1.08:1

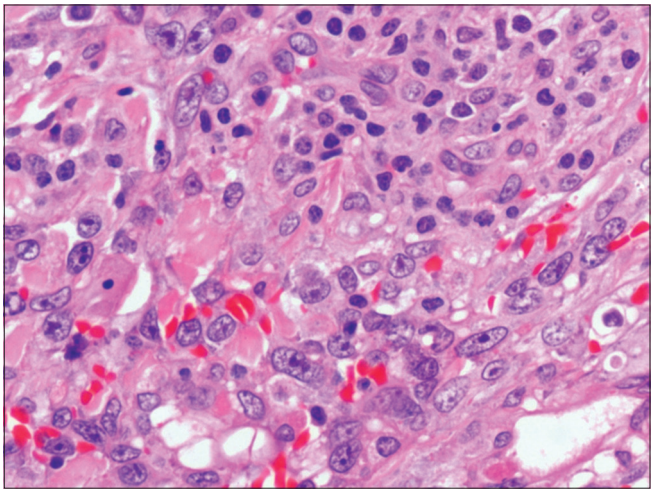

Figure 1: Tumor cells forming vague vascular lumen and showing moderate pleomorphism (H and E, ×400)

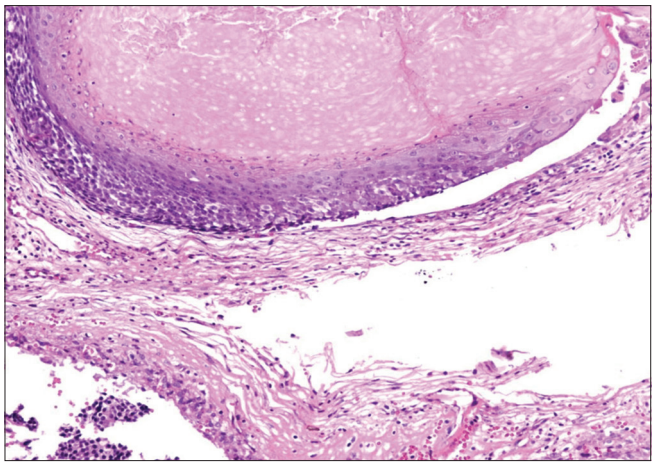

Figure 2: The tumor cells showing ghost cells and basophilic cells (H and E, ×200)

tumor, diagnosed as metastatic chondrosarcoma from rib. Of all the primary malignancies, squamous cell carcinoma was most commonly seen, which accounted for about 9 cases and there were 7 cases of basal cell carcinoma, with one case showing pigmented type. There were two cases of malignant melanoma and others included one case of Bowen's disease, one case of adnexal malignancy (hidradenocarcinoma) and other 3 cases of vascular malignancy (angiosarcoma), the last two already been included under respective categorization.

Miscellaneous group consisted of 20 cases, out of which 8 cases were diagnosed to be seborrheic keratosis, with one case showing pigmented type and other being irritated type. Next commonly encountered were nevi that accounted of about 11 cases. There were 3 cases of intradermal nevi, 3 cases of epidermal nevi-verrucous type, 2 cases of mature dermal nevi, 2 cases of nevus sebaceous and one case of congenital melanocytic nevi was noted. There was a single case of bronchogenic cyst in the scalp.

DISCUSSION

Histopathology of surgically excised scalp tumors aids in the correct diagnosis and management of the patients. Most of our patients were in the age group of 3–80 years with a mean age of 41.5 years. This was in concordance with a study by Kilitci and Asan where they studied 265 extracranial masses from 173 patients. In their study, the age range was 5–87 years, with a mean age of 42.98. In our study, the male to female ratio was 1.08:1, whereas in their study, it was 1.36:1.[2]

Among the benign lesions, the most common lesion was pilar (trichilemmal) cysts (18%). These lesions present as soft, scalp lumps, which can cause clinical confusion with epidermoid cysts, benign lipomas or a liposarcoma. Pilar

Table 2: The histopathological profile of our cases

Type of lesion	Cases
Pilar cyst	
Pilar cyst	12 (16% of total benign cases)
Calcified type	6 (8% of total benign cases)
Vascular lesions	
Lobular capillary hemangioma	12 (16% of total benign cases)
Ulcerated type	1 (1.3% of total benign cases)
Adnexal lesions	
Pilomatrixoma	5 (6.6%f total benign cases)
Nodular hidradenoma	5 (6.6% of total benign cases)
Eccrine poroma	1 (1.3% of total benign cases)
Syringocystadenoma papilliferum	1 (1.3% of total benign cases)
Cylindroma	1 (1.3% of total benign cases)
Steatocystoma simplex	1 (1.3% of total benign cases)
Mixed adnexal tumor	
Chondroid syringoma	1 (1.3% of total benign cases)
Trichillemmal lesion	
Proliferating trichilemmal tumor	3 (4% of total benign cases)
Spindle cell lesions	
Neurofibroma	2 (2.6% of total benign cases)
Schwannoma	2 (2.6% of total benign cases)
Dermatofibroma	1 (1.3% of total benign cases)
Spindle cell lesion	2 (2.6% of total benign cases)
Malignant lesions	
Squamous cell carcinoma	9 (36% of total malignant cases)
Basal cell carcinoma	6
Pigmented type	1 (28% of total malignant cases)
Malignant melanoma	2 (8% of total malignant cases)
Hidradeno carcinoma	1 (4% of total malignant cases)
Angiosarcoma	3 (12% of total malignant cases)
Bowen's disease	1 (4% of total malignant cases)
Miscellaneous group	
Seborrheic keratosis	6
Pigmented type	1 (8% of total 100 cases)
Infected type	1
Nevi	
Intradermal nevi	3 (3% of total 100 cases)
Verrucous epidermal nevi	3 (3% of total 100 cases)
Mature dermal nevi	2 (2% of total 100 cases)
Nevus sebaceous of Sadasohn	2 (2% of total 100 cases)
Congenital melanocytic nevus	1 (1% of total 100 cases)
Rare lesion	
Bronchogenic cyst	1 (1% of total 100 cases)

Lesions	Cases (n=100) (%)
Pilar cysts	18
Vascular lesions	13
Adnexal tumors	15
Proliferating trichilemmal tumors	3
Spindle cell lesions	7
Malignant lesions	23
Miscellaneous	20

cysts/trichilemmal cysts were the most common lesion seen in another study,[2] where it was 38.1%. In a study by Sau *et al*.,[3] ccalp was the most common site for pilar cysts. Trichilemmal cysts originate from the isthmus of the hair follicles and are often seen at the bottom of the hair follicle. These cysts show keratinization, without a granular layer. We also saw calcification in 6/18 cases of pilar cysts, which could be explained by secondary dystrophic calcification.

Seventy-five percent of our cases were benign and 25% were malignant, as against 96.5% benign and 3.46% to

be malignant.[2] Among the malignant lesions, we had 9 cases presenting as squamous cell carcinoma, 7 cases of basal cell carcinoma, three cases of angiosarcoma, 2 cases of malignant melanoma and one case each of hidradenocarcinoma and Bowen's disease. The incidence of malignant neoplasms of the scalp and skull ranges from 0% to 77%. Most of the malignant cases are metastatic tumors, rather that primary.[4] However in our case, there was only one case of metastatic tumor and all the others were primary.

Vascular tumors are also very common in the head and neck region, followed by extremities and trunk. In our study, 13% were lobular capillary hemangiomas and pyogenic granulomas together and 3% were angiosarcomas. In a study by Dharmesh *et al*., head and neck was the most common site for vascular tumors (67%.) They studied 100 cases of vascular tumors, of which 99% were benign and only 1% was malignant.[5] Most of the benign vascular tumors only require local surgical excision, however intermediate and malignant tumors, require aggressive treatment, with a regular follow-up.

Among the malignant lesions of the scalp, we had three cases of angiosarcoma. Cutaneous angiosarcomas are rare, but aggressive soft tissue sarcomas, usually seen in elderly males. The most common manifestation being in the head and neck area, where the scalp predominates. These lesions usually start off as bruise or a nodule, but sooner progresses to a plaque, may even ulcerate or present as satellite lesions. These may arise *de novo* or develop on a preexisting vascular lesion. All our three cases presented as ulcerated plaques. Pang and Li[6] described 38 patients of angiosarcoma scalp, along with the treatment options and survival data. The treatment of scalp angisarcomas is a multi-modality approach including radical surgery, adjuvant radiotherapy, chemotherapy, and immunotherapy. The clinical suspicion of malignancy in an innocent looking lesion should prompt a biopsy diagnosis, which can prevent rapid growth and metastasis.

We reported three cases of proliferating trichilemmal tumor, with excessive epithelial proliferation and no atypia. Hence, we categorized the lesion as benign. However, if the lesion starts growing rapidly and the cells acquire atypical features, it is considered malignant. The features that suggest malignancy are diameter larger than 5 cm, rapid growth, invasion of surrounding tissues, prominent atypia, high mitosis, and severe dysplasia.[7,8]

These lesions are at times indistinguishable from squamous cell carcinoma. Clinically also these lesions present as a cauliflower such as growth, mimicking squamous cell carcinoma.[9] However, squamous cell carcinoma usually presents with an infiltrative border, formation of keratin pearls and marked atypia. We reported nine cases of squamous cell carcinoma in the scalp region.

We had seven cases of basal cell carcinoma in the scalp. Demirseren *et al*. did a retrospective analysis of 331 cases of basal cell carcinoma of the head and neck region.[10] According to their study, the most common location was the nose, as seen in 107 cases, followed by orbit in 63 cases, cheek in 60 cases, temporofrontal in 42 cases, auricular in 23 cases, scalp in 21 cases, perioral in 9 cases, and the chin and neck in 6 cases.

Hence, the accurate diagnosis of scalp lumps is necessary to arrive at the treatment modality and for prognosis. It also removes the anxiety of the patients, as it is cosmetically unappealing to some patients.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

REFERENCES

1. Mane AV, Patil LY, Jadhav SB. Histopathological analysis of scalp lesions: Five years retrospective study of Western India. Int J Contemp Med Res 2017;4:1500-3.
2. Kilitci A, Asan Z. Histopathological profile of surgically excised scalp and skull lesions. Cyprus J Med Sci 2018;3:63-7.
3. Sau P, Graham JH, Helwig EB. Proliferating epithelial cysts. Clinicopathological analysis of 96 cases. J Cutan Pathol 1995;22:394-406.
4. Carson HJ, Gattuso P, Castelli MJ, Reddy V. Scalp lesions. A review of histopathologic and fine-needle aspiration biopsy findings. Am J Dermatopathol 1995;17:256-9.
5. Dharmesh PK, Prashant P, Amrish NS. Histopathological study of 100 cases of vascular tumors. Natl J Med Res 2012:2;152-5.
6. Pang SS, Li GK. Prognostic factors of survival in treatment of scalp angiosarcoma in Chinese population. JPRAS Open 2016;7:1-7.
7. Sharma R, Verma P, Yadav P, Sharma S. Proliferating trichilemmal tumor of scalp: Benign or malignant, a dilemma. J Cutan Aesthet Surg 2012;5:213-5.
8. Alici O, Keles MK, Kurt A. A Rare Cutaneous Adnexal Tumor: Malignant Proliferating Trichilemmal Tumor, Case Reports in Medicine, 2015. Available from: https://doi.org/10.1155/2015/742920.
9. Lakshmi AB, Rao NS, Das B, Kartheek BV. Proliferating trichilemmal tumour: A case report with review of literature. Int J Res Med Sci 2014;2:1223-5.
10. Demirseren DD, Ceran C, Aksam B, Demirseren ME, Metin A. Basal Cell Carcinoma of the Head and Neck Region: A Retrospective Analysis of Completely Excised 331 Cases. J Skin Cancer 2014;2014. Available from: https://doi.org/10.1155/2014/858636