Histopathological Analysis of Scalp Lesions: Five Years Retrospective Study of Western India

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ABSTRACT

Introduction: A variety of inflammatory and neoplastic scalp lesions are encountered in clinical practice, which can be attributed to trauma, infection, inflammation, abscess, allergic reaction, or tumor. Inflammation can occur from a medication reaction, trauma or an autoimmune disease. Benign lesions are in majority but malignant lesions are not uncommon. The present study was undertaken to study the prevalence of various scalp lesions and to correlate the histopathological finding with clinical features, and other investigations wherever possible.

Materials and methods: The present retrospective study reviewed 77 cases of scalp lesions from the record of one of the largest tertiary care hospital of western India over a duration of five years. Medical reports of patients diagnosed with clinical diagnosis of scalp lesions were studied. H&E stained slides of the scalp lesions were retrieved and reviewed. Clinical and histopathological diagnosis were studied for each case to evaluate clinically misdiagnosed cases. Data so obtained was tabulated and was analysed using SPSS version 17 software. and was expressed as percentage and number as required.

Results: Total 77 cases were studied out of which majority were benign mainly 54.5% keratinous cyst and only 2.6% were malignant Squamous Cell Carcinoma. No opinion was possible in two cases out of total 77 cases; one case because of scanty tissue and other due to suboptimal preservation of tissue. Out of total 77 cases 7 (5.39%) cases were clinically misdiagnosed

Conclusion: A high index of clinical suspicion is essential to ensure early detection of malignancies and initiate treatment. Though rare, proliferative forms of trichelemmal cyst have been reported which mimic squamous cell carcinoma.

Keywords: Scalp Lesions; Keratinous Cyst; Squamous Cell Carcinoma

INTRODUCTION

A variety of inflammatory and neoplastic scalp lesions are encountered in clinical practice.[1] which can be attributed to trauma, infection, inflammation, abscess, allergic reaction, or tumor. Inflammation can occur from a medication reaction, trauma or an autoimmune disease.[2] These are common in both children and adults. They can occur as primary scalp diseases, such as tinea capitis, traction alopecia, folliculitis keloidalis nuchae, and folliculitis decalvans, or as part of a generalised skin disease, like atopic dermatitis, seborrhoeic dermatitis, psoriasis, lichen planus, pityriasis rubra pilaris, and secondary syphilis. Scalp disorders can be non-scarring and reversible, while others can cause scarring, and are often permanent.[3] Benign lesions comprise the majority of scalp lesions such as epidermal inclusion cyst, pilar cyst, dermoid cyst, lipoma, capillary hemangioma. Although malignant lesions such as squamous cell carcinoma, sebaceous carcinoma, trichelemmal carcinoma and metastasis from the other sites are also responsible.[2] Among scalp lesions, metastases from lungs are responsible as the third most common malignancy, behind only to primary basal cell carcinoma and primary squamous cell carcinoma.[4,5] It is also seen that many lesions arising from this site such as adnexal tumours have overlapping histological features although few peculiar features help in their differentiation. Thus we are studying histopathologic features of scalp lesions received in tertiary care hospital in Western India.

The present study was undertaken to study the prevalence of various scalp lesions and to correlate the histopathological finding with clinical features, and other investigations wherever possible.

MATERIAL AND METHODS

The present retrospective study reviewed 77 cases of scalp lesions from the record of one of the largest tertiary care hospital of western India over a duration of five years from October 2010 to September 2015. The study was approved from the Institutional ethical committee. Medical reports of patients diagnosed with clinical diagnosis of scalp lesions were studied. H&E stained slides of the scalp lesions were retrieved and reviewed. Special stains were done wherever needed. The data retrieved included demographic data such as age, sex, occupation, relevant positive and negative clinical history, radiologic findings and histological diagnosis. The types of pathologic entities that appeared in the scalp were tabulated. Cystic lesions were further divided into epidermal cysts and Trichelemmal cysts or pilar cysts. Neoplastic lesions were further classified as benign or malignant. Clinical and histopathological diagnosis were studied for each case to evaluate clinically misdiagnosed cases. Data so obtained was tabulated and was analysed using SPSS version 17 software and was expressed as percentage and number as required.

RESULTS

In our study the patient's age ranged from 6 months to 60 years with the mean age being 30.5 years. The sex distribution of scalp lesions in the present study was slightly greater in men accounting for 44 (57.1%) cases, and 33 cases in female accounting for 42.9% of the total cases of 77 (table 1).

Out of the total of 77 cases majority of them were keratinous

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cysts, accounting for 42 of total cases, (54.5%) (table 2). Epidermal inclusion cysts constituted 15 cases which accounted for 35.7% of the total keratinous Cysts. One ruptured epidermal inclusion cyst shows foreign body granuloma. Pilar cysts or TC was the most common variant constituted 27 of the total, which accounted for 64.3% of the total cases (table 3). Lipoma and vascular lesions were seen in nine cases are in equal proportion, each accounting for 11.7% of all cases (table 2). Among vascular lesions, the most common lesion was Capillary hemangioma found in four cases accounting for 44.4% of all vascular lesions followed by Granuloma pyogenicum in three cases accounting for 33.3% of all vascular lesions. Arterio-venous malformation seen in two cases accounting for 22.2% of all vascular lesions (table 3).

Adnexal lesions consisted of five cases accounting for 6.5% of the total cases (table 2). Among them, the most common lesions were dermoid cysts seen in four cases (most commonly in parietal region) accounting for 80% of all adnexal lesions followed by Chondroid syringoma which was seen in one case accounting for 20% of all cases of adnexal lesions. Keratinized squamous epithelial lining was present in all four cases. Intraluminal keratin fragments were seen in three out of four cysts accounting for 75% of all. Adnexal structures like hair shaft were present in 2 out of 4 cases accounting for 50% of all cysts. Sebaceous glands were seen in three cases (75%) of all four cases (table 3).

Malignant lesions consisted two cases accounting for 2.6% of the total cases (table 2). Both were squamous cell carcinoma. One was moderately differentiated squamous cell carcinoma with invasion. Another was poorly differentiated squamous cell carcinoma with invasion (table 3). One case showed benign lymph node in the form of dermatopathic lymphadenitis.

Miscellaneous group consisted of seven cases accounting for 9.1% of the total cases (table 2). Out of these, two cases were Nevi (Junctional and Neurotized dermal nevus of each) and two were Chronic inflammatory lesions; each accounting for 28.6% of all miscellaneous lesions. One case of Schwannoma, one case of JXG and one case of Actinomycosis was seen; each accounting for 14.3% of all miscellaneous lesions (table 3).

No opinion was possible in two cases out of total 77 cases; one case because of scanty tissue and other due to suboptimal preservation of tissue (table 3). Out of total 77 cases 7 (5.39%) cases were clinically misdiagnosed (table 1).

Details	No. of cases =77
Mean Age	30.5 years
Male	44 (57.1%)
Female	33 (42.9%)
Male:Female	1.3:1
Clinically misdiagnosed cases	7 (5.39%) cases

Table-1: Demographic details and Clinically misdiagnosed cases

Type of Lesion	Cases (n=77)
Keratinous cysts	42 (54.5%)
Lipoma	9 (11.7%)
Vascular lesion	9 (11.7%)
Adnexal lesions	5 (6.5%)
Malignant lesions	2 (2.6%)
Miscellaneous group	7 (9.1%)
No opinion	2 (2.6%)

Table-2: Type of lesions

DISCUSSION

Obtaining histopathologic diagnosis via biopsy is the gold standard to diagnose any suspicious pathologic lesion.[6]

In our study the patient's age ranged from 6 months to 60 years. The mean age being 30.5 years. which is in discordance with a study conducted by Spitz et al[1] in which the age group ranged from 29 to 91 yrs, with a mean age of 61, The male to female ratio in our study was 1.3:1 whereas 1.1:1 was reported by HJ Carson et al[7] in their study. Spitz et al[1] reported a similar sex distribution as ours.

In the present study the benign lesions were the commonest with majority being keratinous cysts (epidermal cysts and trichelemmal cysts), lipoma and vascular lesions (capillary haemangioma and pyogenic granulomas). Keratinous cyst was the most common benign lesion in our case. A distinction between pilar and epidermal cysts is essential because of differing implications. Pilar cysts are often multiple and may progress to pilar tumors. They need wide excision as they produce daughter cysts that may be left behind if excision is

Type of Lesion		Cases
Keratinous cysts,	Epidermal inclusion cysts	15 (35.7% of the total keratinous Cysts)
	Pilar cysts or TC	27 (64.3% of the total keratinous cysts)
Vascular lesion	Capillary hemangioma	4 (44.4% of all vascular lesions)
	Granuloma pyogenicum	3 (33.3% of all vascular lesions)
	Arterio-venous malformation	2 (22.2% of all vascular lesions)
Adnexal lesions	Dermoid cysts	4 (80% of all adnexal lesions)
	Chondroid syringoma	1 (20% of all cases of adnexal lesions)
Malignant lesions	Moderately differentiated squamous cell carcinoma with invasion	1 (50% of malignant lesions)
	Poorly differentiated squamous cell carcinoma with invasion	1 (50% of malignant lesions)
Miscellaneous group	Nevi	2 (28.6% of all miscellaneous lesions)
	Chronic inflammatory lesions	2 (28.6% of all miscellaneous lesions)
	Schwannoma,	1 (14.3% of all miscellaneous lesions)
	JXG	1 (14.3% of all miscellaneous lesions)
	Actinomycosis	1 (14.3% of all miscellaneous lesions)
No opinion cases	Due to scanty tissue	1
	Due to suboptimal preservation of tissue.	1

Table-3: Details of various lesions

not adequate.[8]

In the study by Leena et al,[9] they found 32.6% cases of keratinous cysts (most common), 10.9% cases of lipoma and 21.7% cases of vascular lesions. This is in concordance with our study. Garcia-Rojo et al[10] also found 16 trichilemmal cysts and eight lipomas in 62 scalp aspirates. Similarly Hingway SR et al[8] also reported keratinous cysts, including epidermal and pilar cysts, as the commonest lesions diagnosed among scalp lesions. Lymph node lesions were least commonly seen in all the above studies including ours. We found only 1 case (1.3%) out of total 77 cases. In our study malignancies constituted 2.59% of all the cases. Squamous cell carcinoma was the most common malignancy among all malignant tumors of scalp. We found only two cases of malignant scalp tumors both of them were squamous cell carcinoma. In present study which correlated with the studies carried out by Leena et al[9] and Adu EJK et al.[11] Another study by Manchanda et al[12] found that basal cell carcinoma was more common than squamous cell carcinomas and was seen in elderly patients.

In our study keratinous cysts were the most common lesions accounting for 54.5% correlates with study of Carson et al,[7] keratinous cysts (26.7%) were the most common cystic lesions. Trichelemmal cyst was the most common benign lesion in our case. We found 27 cases (36.0%) out of total 75 benign lesions. Trichilemmal cyst, also called as pilar cyst, presents as smooth, mobile, firm dermal nodule on the scalp and these are keratin filled cysts with a wall resembling the external root sheath of a hair follicle. These cysts affect 5% to 10% of the population. They are most often benign and can recur after incomplete excision. In some cases, malignant degeneration and invasion can occur.[13]

Epidermal cysts are common subcutaneous lesions that usually involve the scalp, face, neck, back, or trunk. Conventional epidermal cysts are usually slow-growing masses ranging from a few millimetres to a few centimetres in diameter and are less than 5 cm in diameter. Giant epidermal cysts with a diameter of 5 cm or more are rare but have been reported[14] We found 1 giant epidermal cyst of a size 7 x 5.5 x 4cm (more than 5 cm in size) accounting for 6.7% of all epidermal cysts. Im JT et al[14] mentioned 1 case of giant epidermal cyst in their study. Due to the intrinsic anatomy of the scalp and face, benign lipomas are relatively uncommon with a case prevalence of 2%–14%.[15] We had 9 cases of Lipoma accounting for 11.7% of all scalp lesions. This finding was comparable to study carried out by Truhan et al.[15] Carson et al[7] and Spitz et al[1] reported 5.5% and 2.8% cases respectively of lipoma in their study of scalp lesions, there was a slight discordance in the incidence of our study and these two studies.

Histopathological assessment was done according to ISSVA (International Society for the Study of Vascular Anomalies) classification. Vascular lesions in our study were broadly classified into vascular tumors and vascular malformations. Increased endothelial cell turnover was witnessed in vascular tumors and was not appreciated in vascular malformations. Increased endothelial cell turnover was assessed histopathologically under light microscopy by documenting increased mitoses. Of the 9 cases we reported, 7 cases (77.8%) were classified as vascular tumors which included haemangioma and 2 cases (22.2%) were classified as vascular malformations (Arterio-Venous Malformation).Our findings correlated with other studies done by Ramani et al[16] and Adnani et al.[17] In the study by Ramani et al,[16] of the 44 cases reported, 39 cases were classified as vascular tumours which included haemangioma and 5 as vascular malformations which included lymphangiomas. Our results were consistent with available literature.

Capillary haemangioma was the most common vascular lesion found in our study. It accounted 44.4% of all the vascular lesions. Kapuria et al[18] in their study showed similar findings.

In our present study, we found 3 cases of pyogenic granuloma with female predominance. It accounted for 3.9% out of total 77 studied cases. In the study by Leena et al,[9] they found 7 cases (15.2%) of pyogenic granuloma out of total 46 cases they studied. In our present study, we found 4 cases of dermoid cysts and they were analysed histologically.

The histological appearances revealed in the present study remained highly comparable with studies conducted by Reissis at el[19] and Shields et al.[20] Chondroid syringoma represents the cutaneous counterpart of mixed tumour (pleomorphic adenoma) of salivary glands, therefore it is also termed “mixed tumour of the skin”. It is a rare, benign, skin appendageal tumour. We found 1 case out of total 77 scalp lesions in our current study accounting for 1.3% of all cases. Histological findings seen in our case were nests of cuboidal epithelial cells, few ductules, and occasional keratinous cysts filled with eosinophilic material and fibromyxoid stroma showing lobules of mature cartilage with bone formation.

In the present study, we found 1 case of Schwannoma in our present study. Histopathological findings revealed typical features of Schwannoma. Tumour was encapsulated by perineurium, and characterized by two types of histological patterns: Antoni type A and Antoni type B. Antoni type A is highly ordered cellular pattern in which spindle cells are arranged in compact fascicles and their nuclei are arranged in palisades (Verocay bodies). Antoni type B tissue is less cellular with pale zones of gelatinous matrix and admixed with cystic, edematous or myxoid degeneration.

One single case of juvenile xanthogranuloma out of 77 cases accounting for 1.3% of total cases. Usually lesions are of size 0.5 to 1cm in diameter. Most of lesions appear during first year of life.[21] But in our study we found 1.8 x 1 x 1cm sized juvenile xanthogranuloma lesion in adult age group. The lesion in adult is not uncommon (like in our study). In our study we had single case of actinomycosis out of 77 cases accounting for 1.3% of total cases. Typical microscopic findings of actinomycosis was seen in our case microscopic finding shows chronic abscess with polymorphs, surrounding granulation tissue and fibrosis.[22]

In our study two cases of nevi seen (1 was junctional nevus and other was neurotized dermal nevus accounting for 2.6% of total cases.

In our study, there were two inconclusive cases (2.6%). This percentage was comparable with that of Spitz et al[1] (2.86%) and Carson et al[7] (5.56%).

We found 7 cases (9.1%) in our current study with changed clinical diagnosis after histopathological examination. Benign tumours like Schwannoma and Chondroid Syringoma were clinically misdiagnosed as sebaceous cysts.1 case of epidermal cyst was found to be hemangioma after histopathological examination. These could be due to similar clinical

presentations of various cysts and benign tumours; and therefore histopathological examination is very essential for confirmed diagnosis and for further management of scalp les cases of epidermal cyst were clinically diagnosed as dermoid cysts. The scalp is a common repository for metastatic tumors, most likely due to its rich vascularity. Awareness of this fact can be useful to dermatologists or oncologists in selecting the better diagnostic procedure for a patient.[23]

CONCLUSION

The scalp is the most neglected system and not an uncommon site for tumors. Benign tumors are observed more frequently in this region. A high index of clinical suspicion is essential to ensure early detection of malignancies and initiate treatment. Though rare, proliferative forms of trichelemmal cyst have been reported which mimic squamous cell carcinoma.

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