

HISTOPATHOLOGICAL SPECTRUM OF SKIN ADNEXAL TUMOURS IN A TERTIARY CARE HOSPITAL

Archana Devi Sankaran¹, Nandhitha Navaneetha Krishnan², Radhika Arumugam Rangaraj³

¹Assistant Professor of Pathology, Government Vellore Medical College and Hospital, Vellore, India.

²Assistant Professor of Pathology, Government Vellore Medical College and Hospital, Vellore, India.

³Associate Professor of Pathology, Government Vellore Medical College and Hospital, Vellore, India.

Received : 17/12/2023
Received in revised form : 08/02/2024
Accepted : 24/02/2024

Keywords:

Skin adnexal tumours, Nodular hidradenoma, Pilomatricoma.

Corresponding Author:

Dr. Radhika Arumugam Rangaraj,
Email: radimadi2006@gmail.com.

DOI: 10.47009/jamp.2024.6.1.308

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (1); 1551-1555



Abstract

Background: Skin adnexal tumours are a large and diverse group of benign and malignant neoplasms that differentiate into hair follicles, sebaceous, eccrine and apocrine glands. Histopathological diagnosis plays a vital role in confirming the diagnosis. **Aim:** This study aimed to analyse the histomorphological features of various skin adnexal tumours and their correlation with demographic features such as age, sex and site of involvement. **Material and Methods:** This was a retrospective descriptive study of 55 cases of skin adnexal tumours diagnosed by histopathological examination for five years from January 2015 to December 2019 in the Department of Pathology, Government Vellore Medical College and Hospital, Vellore. H&E slides and paraffin blocks were retrieved from the pathology archives, slides were reviewed and clinical details were collected from the pathology registry. **Results:** Most skin adnexal tumours were benign (96%), whereas malignant tumours were rare (4%). The male-to-female ratio was 1:1.4. The head and neck were the most common locations (71%). Skin adnexal tumours were most common in the age group 61-70 years. Eccrine differentiation was observed in 51% of the tumours, followed by pilar (38%), apocrine (7%) and sebaceous tumours (4%). The most common skin adnexal tumours reported in this study included nodular hidradenoma (29%), followed by pilomatricoma (21%). The malignant tumours reported in this study were malignant nodular hidradenoma (2%) and malignant chondroid syringoma (2%). **Conclusion:** Skin adnexal tumours are rare, with benign eccrine tumours being the most common. The most common age group was 61-70 years. Nodular hidradenoma being the most common benign skin adnexal tumor.

INTRODUCTION

Skin adnexal tumours are uncommon, diverse groups of benign and malignant neoplasms that differentiate into hair follicles, sebaceous glands, eccrine glands, and apocrine glands. Histopathology plays a vital role in the confirmation of diagnosis and precise categorisation of these tumours along their line of differentiation. Most skin adnexal tumours are solitary. However, multiple tumours are markers of internal malignancies that are associated with inherited syndromes, such as Brooke-Spiegler syndrome (Cylindroma, Trichoepithelioma), Cowden syndrome (Trichilemmoma), and Muir Torre syndrome (sebaceous tumours). These tumours are derived from multipotent

undifferentiated cells present in the epidermis or appendageal structures. Histomorphological features are related to the activation of molecular pathways which are responsible for forming the mature adnexal structure.^[1,2,3] Therefore histopathological diagnosis of malignant adnexal tumours is essential for both therapeutic and prognostic purposes, as well as for the follow-up of these patients. In this study, we analysed the histomorphological features of skin adnexal tumours and their correlation with age, sex, and the site of involvement in a tertiary care centre.

Aim

To analyse the histomorphological features of various skin adnexal tumours and correlate the age,

sex and site of involvement of various skin adnexal tumours.

MATERIALS AND METHODS

This was a retrospective descriptive study conducted for 5 years from January 2015 to December 2019 in the Department of Pathology, Government Vellore Medical College and Hospital, Vellore. 55 cases diagnosed as skin adnexal tumours on histopathological examination were included in this study.

Inclusion Criteria

Patients with skin adnexal tumours diagnosed by histopathological examination were included in the study.

Exclusion Criteria

Patients with non-neoplastic lesions, inflammatory disorders, epidermal skin lesions, squamous cell carcinoma, basal cell carcinoma, and malignant melanoma were excluded.

H&E slides and paraffin blocks were retrieved from pathology archives, slides were reviewed, and clinical details were collected from the pathology registry for 5 years from January 2015 to December 2019.

RESULTS

In this retrospective study, 55 patients were diagnosed with skin adnexal tumours by histopathological examination. Of these, 96% (53/55) were benign and 4% (2/55) were malignant (Figure 1). Skin adnexal tumours were observed in various age groups ranging from 11 years to 80 years in this study and were most common in the age group of 61-70 years (15/55), followed by 41-50 years (13/55) and 51-60 years (11/55) (Table 1). The male-to-female ratio was 1:1.4 (23:32) (Figure 2). For location, the head and neck region was the most common site 71% (39/ 55), followed by the trunk 20% (11/ 55) and extremities 9% (5/ 55). On the basis of their line of differentiation , eccrine tumours 51% (28/ 55) were the most common, followed by pilar tumours 38% (21/ 55), apocrine tumours 7% (4/55) and sebaceous tumours 4% (2/ 55) (Table 1). The benign eccrine tumours included nodular hidradenoma, cylindroma, eccrine poroma, eccrine spiradenoma and chondroid syringoma. Malignant eccrine tumours include malignant nodular hidradenoma and malignant chondroid syringoma. The pilar tumours included trichoepithelioma, pilomatricoma and proliferating trichilemmal cyst. Apocrine differentiation tumours included apocrine hidrocystoma, hidradenoma papilliferum and syringocystadenoma papilliferum. The sebaceous tumours included sebaceous adenoma and sebaceoma. [Table 2]

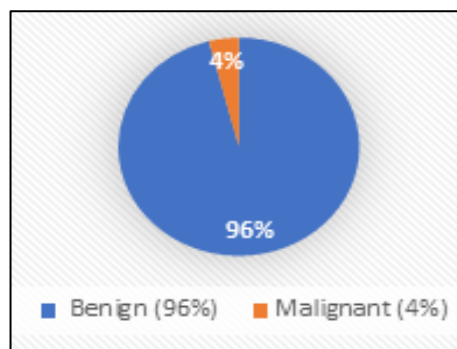


Figure 1: Distribution of skin adnexal tumours according to behaviour

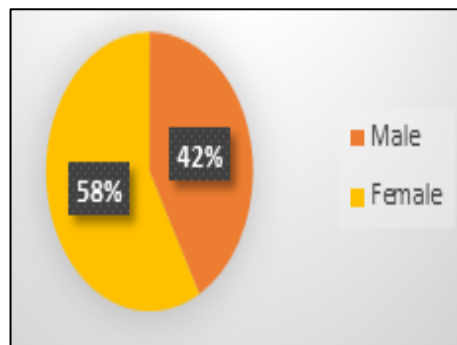


Figure 2: Sex distribution of skin adnexal tumours

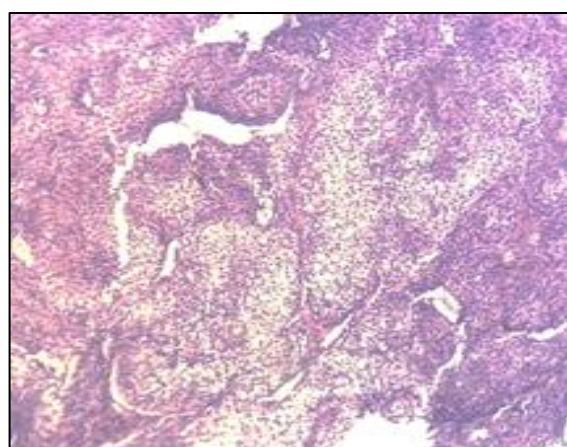
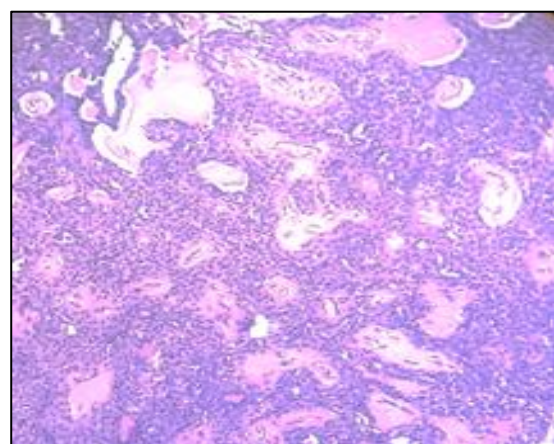


Figure 3: Nodular Hidradenoma: Two cell populations. Lobules of polyhedral cells with round nuclei, slightly basophilic cytoplasm, round cells with clear cytoplasm, small dark nuclei, and eosinophilic hyalinised stroma (10x)

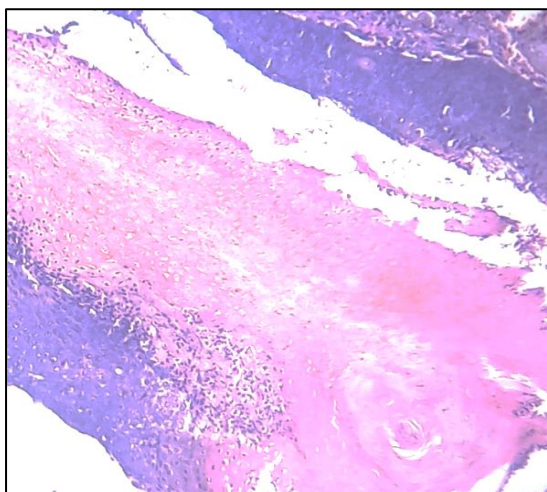


Figure 4: Pilomatricoma. Islands of basophilic cells with round to elongated nuclei, scant cytoplasm, and indistinct cell borders. The basophilic cells showed a transition into shadow cells with a central unstained area of lost nuclei (10x)

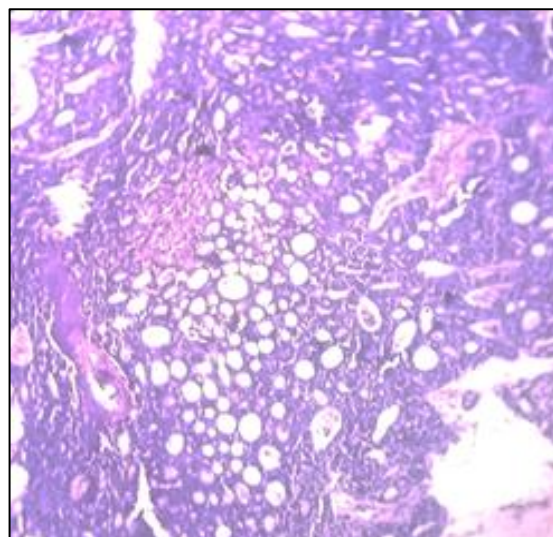


Figure 5: Chondroid syringoma. Epithelial cells arranged in ducts and sheets intervening stroma show myxoid change (10x)

Table 1: Age-wise and line of differentiation distribution of skin adnexal tumours

		Number of cases	Percentage
Age group (years)	11-20	3/55	5%
	21-30	1/55	2%
	31-40	7/55	13%
	41-50	13/55	24%
	51-60	11/55	20%
	61-70	15/55	27%
	>70	5/55	9%
Skin Adnexal tumours according to Line of differentiation	Eccrine tumours	28/ 55	51%
	Hair follicle tumours	21/ 55	38%
	Apocrine tumours	4/ 55	7%
	Sebaceous tumours	2/ 55	4%

Table 2: The frequency distribution of benign and malignant skin adnexal tumours

Tumour		Category	No of cases	Percentage
Benign	Nodular hidradenoma	Eccrine	16/55	29%
	Chondroid syringoma	Eccrine	4/55	7%
	Cylindroma	Eccrine	3/55	5%
	Eccrine spiradenoma	Eccrine	2/55	4%
	Eccrine Poroma	Eccrine	1/55	2%
	Pilomatricoma	Hair follicle	12/55	21%
	Proliferating Trichellemmal tumour	Hair follicle	5/55	9%
	Trichoepithelioma	Hair follicle	4/55	7%
	Hidradenoma Papilliferum	Apocrine	1/55	2%
	Syringocystadenoma Papilliferum	Apocrine	1/55	2%
	Apocrine hydro cystoma	Apocrine	2/55	4%
	Sebaceous Adenoma	Sebaceous	1/55	2%
Malignant	Sebaceoma	Sebaceous	1/55	2%
	Malignant Nodular Hidradenoma	Eccrine	1/55	2%
	Malignant Chondroid Syringoma	Eccrine	1/55	2%

DISCUSSION

Skin adnexal tumours are relatively uncommon. The data in this study cannot indicate the prevalence of skin adnexal tumours as it was a retrospective study. In the present study, most of the skin adnexal tumours were benign 96% and only 4% were malignant which correlates with other studies, such as Garima et al., where benign was (96.5%) and malignant (3.5%). Kumar et al. reported benign skin adnexal tumours to be (98.4%) and malignant (1.6%).^[4,5] In the present study, the male-to-female

ratio was 1:1.4, compared to that reported by Garima et al. 1:1.3, Amin et al. 1:1.27 and Vani et al. M: F 1:1.68.^[4,6,7]

In the present study, the most common age group for skin adnexal tumours was 61-70 years (27%) when compared with Kumar et al., the most common age group was 41-50 years (23.33%). Thakuria et al. reported 41-50 years (28%) and Sharma et al. reported 51-60 years (26.78%) were the most common age group for the presentation of skin adnexal tumours.^[8,9,2] In this study, most skin

adnexal tumours were present in the elderly age group.

The most common site of skin adnexal tumours in the present study was the head and neck (71%), followed by the trunk (20%) and extremities (9%). This correlates with the findings of Thakuria et al., who reported that the head and neck (68%) were the most common site, followed by the trunk (20%) and extremities (12%). Kaur et al. also reported that the head and neck (78.18%) were the most common site, followed by the extremities (13.64%) and trunk (8.18%).^[9,10]

Among the skin adnexal tumours, eccrine tumours (51%) were the most common, followed by hair follicle tumours (38%), apocrine tumours (7%) and sebaceous tumours (4%) which correlates with the study by Garima et al., who reported that eccrine tumours (43.8%) were the most common, followed by hair follicle tumours (38.6%), sebaceous tumours (12.3%) and apocrine tumours (5.3%). Pathakamuri et al. also reported that eccrine tumours (86%) were the most common, followed by pilar tumours (8%), apocrine tumours (4%) and sebaceous tumours (2%). Nayak et al. reported that pilar tumours (52.4%) were the most common, followed by eccrine (30.9%), sebaceous (11.6%) and apocrine tumours (7.1%).^[4,11,12]

Nodular Hidradenoma was the most common benign tumour in this study 29% (16 /55) which is consistent with the findings of Sharma et al. (21.43%), Amin et al. (16%) and Vani et al. (15.78%), who also observed nodular hidradenoma to be the most common benign skin adnexal tumour.^[2,6,7] Nodular hidradenoma was common in the age group of 41-60 years and the most common site was the head and neck. The nodular hidradenoma presented as solid, cystic swelling and cystic swelling with multiple papillary projections. Microscopically, nodular hidradenoma presented as a well-circumscribed dermal nodule, the solid portion of the tumour showed two populations of cells, polyhedral cells with round nuclei and eosinophilic cytoplasm, other population showing round cells with clear cytoplasm and a small dark nucleus with distinct cell membrane surrounded by hyalinised stroma and cystic spaces of varying sizes (Figure 3).

In this study, pilomatricoma was the second most common benign skin adnexal tumour (21%, 12/55), whereas Kaur et al. (28.2%) and Bhat et al.(36.3%) in their study, reported pilomatricoma was the most common benign skin adnexal tumour .^[10,13] The most common age group of pilomatricoma was 41–60 years, and the most common site was the head and neck, followed by the trunk and extremities. Microscopically, the Pilomatricoma showed two populations of cells. Basophilic cells with oval to round deeply basophilic nuclei, scant cytoplasm and indistinct cell borders. The shadow cells or ghost cells with distinct cell borders and central unstained area as shadow of lost nuclei (Figure 4).

In this study, four cases of chondroid syringoma (7%) were reported which was most common in the 4th decade and had varied sites of presentation in the fingers, arm, forehead, and eyelid. Microscopically, chondroid syringomas showed tubular and branching lumina lined by 2 layers of epithelial cells. The luminal layer of cuboidal cells and the peripheral layer of flattened cells were embedded in an abundant chondromyxoid stroma (Figure 5). Four cases of trichoepithelioma (7%) were reported in this study which correlates with the findings of Pathakamuri et al., who reported trichoepithelioma (6%).^[11] The most common site was the face, along the nostril. Trichoepithelioma presents as a well-circumscribed, symmetrical lesion composed of basoloid cells arranged in lace-like solid aggregates. Tumour islands showed peripheral palisading surrounded by a fibroblastic stroma. Horn cysts exhibit trichilemmal keratinisation.

In this study, there were three cases of cylindroma (5%), which presented in the 4th and 5th decade of life, with the head and neck being the most common site. Nayak et al. also reported 3 cases of cylindroma (6.9%) in the head and neck region which is consistent with our study.^[12] It presented as a circumscribed multinodular tumour in the dermis. Individual nodules were composed of mosaic nests of undifferentiated basaloid cells with small dark-stained nuclei and scant cytoplasm. Individual nests fit tightly and neatly in the jigsaw puzzle pattern. The nests are surrounded by a rim of densely eosinophilic PAS-positive and diastase-resistant basement membrane material.

The malignant tumours encountered in this study were malignant nodular hidradenoma (2%) and malignant chondroid syringoma (2%) when compared with Thakuria et al., Nayak et al., and Punjani et al., who reported that sebaceous carcinoma was the most common malignant skin adnexal tumour.^[9,12,14] Bhat et al. reported that malignant nodular hidradenoma was the most common malignant tumour which correlates with the results of our study.^[13]

One case of malignant nodular hidradenoma presented in a 50-year-old male in the flank as an irregular mass with ulceration. Microscopically, it was composed of glands, cords and sheets of pleomorphic epithelial cells with scant cytoplasm and vesicular nuclei infiltrating the stroma. Areas of atypical mitosis and necrosis are also observed. One case of malignant chondroid syringoma had been reported which presented as an exophytic growth in the great toe of a 70-year-old male. Microscopy showed epidermis with ulceration, underlying neoplasm composed of tubular lumina and cystic spaces, sheets of atypical cells with scant to moderate cytoplasm and prominent nucleoli and occasional mitosis in a background of myxoid stroma with foci of necrosis and haemorrhage (Figure 6, 7).

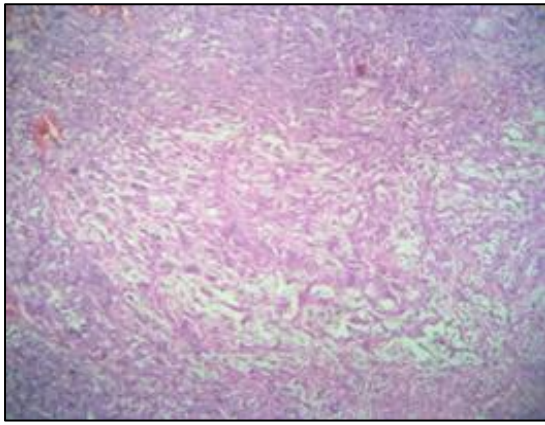


Figure 6. Malignant Chondroid Syringoma (10x),

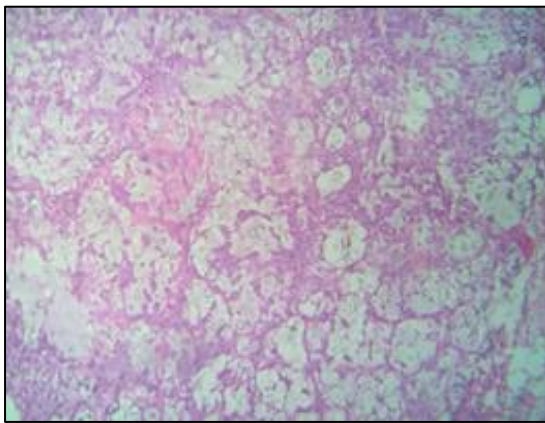


Figure 7. Malignant Chondroid Syringoma (40x)

Immunohistochemistry plays a minimal role in differentiating skin adnexal tumours. Ductal differentiating tumours show carcinoembryonic antigen positivity, sebaceous differentiating tumours show epithelial membrane antigen positivity and pilar differentiating tumours show cytokeratin positivity. However, immunohistochemistry can be useful for differentiating primary adnexal tumours from secondary metastatic tumours. P63 and CK5/6 positivity favours primary cutaneous adnexal carcinoma over metastatic carcinoma.^[14]

CONCLUSION

The overall incidence of skin adnexal tumours is low. In this study, benign tumours were the most common compared to malignant tumours and the majority were eccrine tumours, followed by hair follicle tumours. The head and neck were the most common sites of involvement in this study; females outnumbered males and the most common age group for skin adnexal tumours was 61-70 years. Nodular hidradenoma is the most common benign skin adnexal tumour, followed by pilomatricomas. Malignant skin adnexal tumours include malignant nodular hidradenoma and malignant chondroid syringoma. Skin adnexal tumours are a diagnostic

challenge to clinicians due to their nonspecific clinical presentation and to pathologists because of their varied histomorphological features and frequency of differentiation along different lines in the same lesion. Histopathological examination remains the mainstay for the diagnosis of skin adnexal tumours.

REFERENCES

1. Klein W. Tumor of the epidermal appendages. *Lever's Histopathology of the Skin*. 2005. <https://cir.nii.ac.jp/crid/1571135650505736320>.
2. Sharma A, Paricharak DG, Nigam JS, Rewri S, Soni PB, Omhare A, et al. Histopathological study of skin adnexal tumours—institutional study in south India. *J Skin Cancer* 2014; 2014:1–4. <https://doi.org/10.1155/2014/543756>.
3. Alexander J, Lazar. *The Skin*. Robbins & Cotran Pathologic Basic of Disease Tenth Edition Elsevier 1144- 1145.
4. Garim G, Gupta N, Kulhari S. A prospective study of histomorphological spectrum of biopsy confirmed skin adnexal tumors in a tertiary care centre at bikaner region. *Int J Contemp Med Res [IJCMR]* 2019;6. <https://doi.org/10.21276/ijcmr.2019.6.4.22>.
5. Kumar VS, Geeta V, Voruganti NK, Kumar OS, Tamilarasi. Histopathological Study of Skin Adnexal Tumours – A Ten years' study. *Int Arch Integr Med* 2018; 5:95-100. https://iaimjournal.com/wp-content/uploads/2018/10/iaim_2018_0510_13.pdf.
6. Amin N, Shah S, Prajapati S, Goswami H. Histomorphological spectrum of skin adnexal tumors at a tertiary care hospital-a retrospective study. *Int J Curr Res Rev* 2016; 8:13. <https://api.semanticscholar.org/CorpusID:74462004>.
7. Vani D, Ashwini NS, Sandhya M, Dayananda TR, Bharathi M. A 5-year histopathological study of skin adnexal tumours at a tertiary care hospital. *IOSR J Dent Med Sci (IOSR-JDMS)*. 2015; 14:1-5. <https://doi.org/10.9790/0853-14470105>.
8. Kumar K, Moula MC. Histopathological study of Skin Adnexal Tumours- 6 years' study, *Indian J App Res* 2016;6:53-55. <https://doi.org/10.36106/ijar>.
9. Thakuria SK, Deka MK, Das A, Phukan A, Khakhlari NM. A two years' study of histopathological spectrum of skin adnexal tumors in a tertiary care centre of Southern Assam, India. *Int J Res Med Sci* 2020; 8:1802. <https://doi.org/10.18203/2320-6012.ijrms20201931>.
10. Kaur K, Gupta K, Hemrajani D, Yadav A, Mangal K. Histopathological analysis of skin adnexal tumors: A three-year study of 110 cases at a tertiary care center. *Indian J Dermatol* 2017; 62:400. https://doi.org/10.4103/ijd.ijd_380_16.
11. Pathakamuri P, Begari V, Takalkar AA. Clinical and histopathological profile of benign appendageal tumours of skin: a descriptive study from Andhra Pradesh. *Int J Res Dermatol* 2019; 5:678. <https://doi.org/10.18203/issn.2455-4529.intjresdermatol20193853>.
12. Nayak GD, Raman S, Rath J, Dash KL, Senapati U. Clinico-pathological study of Skin adnexal tumours in a tertiary care hospital. *IP Arch Cytol Histopathol Res* 2020;5; 224-228. <https://doi.org/10.18231/j.achr.2020.049>.
13. Bhat SP, Kishan Prasad HL, Bhat VS, Jayaprakash Shetty K. Clinicopathological study of cutaneous adnexal tumors in a tertiary hospital of South India. *Indian J Pathol Oncol*. 2016; 3:649-52. <https://doi.org/10.5958/2394-6792.2016.00120.4>.
14. Pujani M, Madaan GB, Jairajpuri ZS, Jetley S, Hassan MJ, Khan S. Adnexal tumors of skin: An experience at a tertiary care center at Delhi. *Ann Med Health Sci Res* 2016; 6:280. https://doi.org/10.4103/amhsr.amhsr_339_14