Cytomorphological Analysis of Skin Adnexal Tumors

Vidya Jha*, Kusum Gupta**, Sachin Kolte***

Abstract

Objectives: To study the cytomorphological features and pitfalls in the cytological diagnosis of various skin adnexal tumors (AT).

Methods: This is a two-year cross sectional descriptive study. Cases diagnosed as skin AT on cytology were included in the study. Histological correlation was done on the biopsies which were available. Pitfalls on cytology were evaluated keeping histopathology as the gold standard for diagnosis.

Results: A total of 46 cases of skin AT were included in the study. Upper limb was the most common site involved by them (36.96%). Young adults were the most commonly affected age group. Of the 46 aspirates, 26 cases (56.50%) which were typed include pilomatricoma (14 cases), chondroid syringoma (6 cases), skin AT of eccrine origin (5 cases) and sebaceous origin (1 case). Specific typing was not possible in 20 cases in this study. The authors did not diagnose any primary malignant tumor of skin in this study. 21 cases had histopathological correlation. Two cases of pilomatricoma showed discordance on histopathology. Out of the five cases diagnosed as skin AT of eccrine origin, one case was confirmed as eccrine poroma and the other as eccrine spiradenoma on histopathology. Out of the 20 cases, which could not be specified on cytology, five were diagnosed as nodular hidradenoma.

Conclusion: FNAC is a useful investigation for diagnosing skin AT but all cases of skin adnexal tumors cannot be typed on cytology.

Introduction

Skin nodules are due to neoplastic and non-neoplastic including inflammatory etiology. An accurate diagnosis of benign and malignant skin lesions can be a challenging task. Primary cutaneous tumors exhibit morphological diversity, particularly adnexal tumors, thus causing problems in cytological interpretation. There are a few large series in the literature on the cytologic findings of skin adnexal tumors. The accuracy rate in these studies varies from 61 to 81%. In a study by Layfield et al., 89% of primary skin tumors were correctly diagnosed as benign or malignant and specific typing was possible in 81% of cases. In another study conducted by Dey et al., FNAC successfully established the benign or malignant nature of skin tumors in 88.9% with exact subtyping possible in only 66.7% of the cases. However, most clinicians prefer to diagnose suspected skin tumors by excisional biopsy as they are easily accessible and hence benign skin adnexal tumors are rarely encountered on FNAC. The early recognition of some ATs is also important as they may be markers of some syndromes associated with internal malignancy, like Cowden’s syndrome. Only a few studies on cytohisto correlation of skin tumors are available in literature. This study will highlight cytomorphological correlates of skin adnexal tumors.

Materials and Methods

This is a two-year cross-sectional descriptive study. Cases diagnosed as skin AT on cytology were included in the study. FNA smears prepared from skin adnexal nodules were stained with Giemsa and Papanicolaou stains. Histological correlation was done on the biopsies which were available. Pitfalls on cytology were evaluated keeping histopathology as the gold standard for diagnosis.

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Results

Out of the 46 skin adnexal tumors, 26 cases were specified and 20 cases could not be specified on cytology as shown in Table 1.

<table>
<thead>
<tr>
<th>Skin adnexal tumors</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMX</td>
<td>14</td>
<td>10</td>
<td>08</td>
<td>02</td>
</tr>
<tr>
<td>Chondroid syringoma</td>
<td>06</td>
<td>04</td>
<td>04</td>
<td>-</td>
</tr>
<tr>
<td>Skin adnexal tumor-Eccrine origin</td>
<td>05</td>
<td>02</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>Skin adnexal tumor (sebaceous origin)</td>
<td>01</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Skin adnexal tumor-Not specified</td>
<td>20</td>
<td>05</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>21</td>
<td>14</td>
<td>02</td>
</tr>
</tbody>
</table>

A=No. of aspirates, B=No. of cases with histopathological diagnoses, C=No. of concordant cases, D=No. of discordant cases

Table 1. Cytohistocorrelation for Skin Adnexal Tumors (46 Cases)

Out of the five cases diagnosed as skin adnexal tumor (eccrine origin), two cases came for histopathological reporting. One case was confirmed as eccrine poroma and the other as eccrine spiradenoma. Out of the twenty cases which could not be specified on cytology, five were diagnosed as nodular hidradenoma (Figs. 1a and 1b).

Figure 1. Nodular Hidradenoma Showing Large Clear Cells. (1a) Geimsa 200X (1b) H&E 100X

Discussion

As compared to the varieties reported on histopathology, skin nodules are grossly under-reported on cytology. This can be due to the fact that these are easily accessible for excision. Only a few large series of FNAC of primary skin tumors with histologic correlation have been reported.\(^1\)\(^-\)\(^4\) In the series by Layfield et al., 89% of primary skin tumors were correctly diagnosed as benign or malignant, and specific typing was possible in 81% of cases. Dey et al. had a similar success rate of 88.9% in establishing the benign or malignant nature of skin tumors. In their study exact subtyping was possible in 66.7%. Layfield et al. had six cases of skin adnexal tumor whereas Dey et al. had 08 such cases.\(^1\)\(^,\)\(^2\)

The skin appendageal tumors (ATs) encompass a wide variety of tumors clinically presenting as nodules and with histologically distinct features. They are basically classified into four groups: tumors with differentiation towards hair follicles, sebaceous glands, eccrine or apocrine glands.\(^5\) These tumors basically originate from undifferentiated pluripotent stem cells and finally differentiate to specific tumors influenced by genetics, local vascularity, and the microenvironment of the epidermis and dermis.\(^6\)\(^-\)\(^8\) These tumors are usually benign, but rarely malignancy can supervene. They are usually missed clinically, subjected to FNAC, and often confirmed by histopathology.

Forty-six cases of skin adnexal tumors were diagnosed on cytology. Upper limb was the most common site involved by them (36.96%) followed by scalp (30.43%). Twenty-five cases were males and twenty-one were females. It involved all the age groups, ranging from 1 to 79 years but young adults were the most commonly affected group.

Of the 46 aspirates, 26 cases which were typed include pilomatricoma (14 cases), chondroid syringoma (6 cases), skin adnexal tumor of eccrine origin (5 cases) and sebaceous origin (1 case). The authors did not diagnose any primary malignant tumor of skin in their study.

Specific typing was not possible in 20 cases in this study, Layfield et al. could successfully type 81% of the adnexal...
tumor cases. They had included epidermal cyst in this study. In five of the eight cases of adnexal tumors studied by Dey et al., FNAB could diagnose the tumor. Exact sub-classification of these tumors was found to be difficult to them also with only 66.7% cases being subtyped.

In the study by Dubb et al., they could not type one case out of the three cases studied. Bansal et al. could not type one case out of the 14 cases they studied and for four cases, diagnosis of benign adnexal tumor suggestive of PMX was given.

In this study, the mean age of presentation of pilomatrixoma was 20.7 years with predominance in females. 50% of the cases were present on upper limb and the rest 50% on scalp and face. All these findings correspond well with the findings of Bansal et al. In their study Bansal et al. found mean age at presentation to be 26.4 years, with females more commonly affected and head and neck region to be the most common site. All the cases in this study presented with a single nodule. In their study, Bansal et al. found 92.5% of the tumors to occur singly. A low percentage (3.5%) of multiple lesions has also been reported by Rotenberg et al.

Ten of the fourteen aspirates of PMX had histological correlation. An exact diagnosis was given in eight cases on cytology (80%). This is higher as compared to the study done by Bansal et al., in which 50% cases were correctly diagnosed as PMX on cytology.

The histopathological diagnoses in aspirates with cytological diagnoses of pilomatrixoma are shown in Table 2.

<table>
<thead>
<tr>
<th>Histopathology</th>
<th>Cytodiagnosis</th>
<th>Pilomatrixoma</th>
<th>Eccrine spiradenoma</th>
<th>Pigmented basal cell Ca</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilomatrixoma (n=10)</td>
<td>08</td>
<td>01</td>
<td>01</td>
<td>10</td>
<td></td>
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</tbody>
</table>

Table 2. Cytohisto Correlation of Pilomatrixoma

In two of the cases diagnosed as pilomatrixoma on cytology, cytohistologic discrepancies arose. One case of eccrine spiradenoma (Fig. 2a) was misdiagnosed as pilomatrixoma (Fig. 2b) in this study. Though both the lesions are benign skin adnexal tumors, this discrepancy arose because of presence of basaloid cells on cytology smears, which can be seen in both the tumors. The other case of pigmented basal cell carcinoma was misdiagnosed as pilomatrixoma. This patient was a 55-year-old man with scalp nodule without obvious ulceration. Smears were of moderate cellularity and showed mainly basaloid cells. Bansal et al. have mentioned in their study that PMX can be misdiagnosed as eccrine spiradenoma owing to the presence of mainly basaloid cells. Sanyal et al. had also confused the aspirate of PMX as basal cell carcinoma.

Four cases of PMX were misdiagnosed as EIC on cytology. Smears from all the four cases showed mainly anucleated and nucleated squamous cells. Calcification was seen in two of the cases diagnosed as EIC with calcification. In these cases, mainly squamous component was aspirated without basaloid and shadow cells. In EIC, foreign type of giant cells, calcification and debris can be seen. In the study by Bansal et al., they also most commonly misinterpreted PMX as EIC. Out of the 14 cases studied, they misinterpreted PMX as EIC in four cases. This was mainly due to the predominance of squamous cells. Similarly, Rege et al. also mistook one of their cases of PMX as EIC. The case which could not be typed on cytology and later on histology was confirmed as pilomatrixoma was mainly due to the lack of characteristic cytological findings of basaloid cells,
giant cells and calcification. Only the presence of few skin adnexal cells was noted. Similar occurrence has been reported by Bansal et al. one of their cases on histology was diagnosed as PMX but on cytology it was not possible to comment.\textsuperscript{10}  

Due to the limited exposure on FNA as well as rarity of the lesion, identification of this entity still remains problematic with misdiagnoses. PMX has also often being misdiagnosed as malignant tumor. In their review of literature, Wang et al. stated that 45% of PMX were diagnosed as other benign lesions or malignant tumors.\textsuperscript{14} Dubb et al. have mentioned in their study that among the malignant tumors, basal cell carcinoma may be mistaken for PMX as occurred in our study.\textsuperscript{15}  

No large series publication highlighting the diagnostic difficulties of skin AT has been published; thus this paper highlights the grey areas in the cytological diagnosis of adnexal tumor.

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**References**


