Pilomatrixoma: Cytodiagnosis without a "Shadow" of Doubt!

Dear Editor,

Pilomatrixoma (PMX) is a benign cutaneous adnexal tumor.[1] The cytological features of PMX are characteristic and well described, but diagnosis can be missed due to focal sampling and predominance of one component over the other or it can at times be misdiagnosed as malignant.[2] Hence, a cytopathologist should be aware of the cytomorphological spectrum of PMX and its potential pitfalls.

A 16-year-old male presented with a right forearm nodule for 6 months, gradually increasing in size. On examination, it measured 3 cm × 3 cm and was firm, nontender, and superficial. The overlying skin was unremarkable. Fine-needle aspiration cytology (FNAC) was performed with 23G needle and smears were stained with Giemsa and Papanicolaou stains. Cytology smears were highly cellular with sheets and clusters of cells. Majority of the cells had a high nucleo-cytoplasmic ratio, hyperchromatic round nuclei, and scanty cytoplasm [Figure 1a]. Numerous mitotic figures were seen. Also seen were anucleate squamous cells and singly dispersed ghost squamous (shadow) cells with faintly visible unstained nuclear outlines [Figure 1c and d]. In addition, granular necrosis and focal calcification were noticed [Figure 1b]. With the above cytomorphological features, a diagnosis of PMX was suggested. Subsequent histopathology showed classic features of PMX.

PMX is located in deep dermal and subcutaneous tissues and the committed sites are neck, cheek, scalp, preauricular region, and pinna followed by upper extremity.[2] Size of the tumor ranges from 0.5 to 3 cm, and it can occur in any age group but is more common in children and young adults.[2] The characteristic cytomorphologic feature of PMX is the presence of ghost/shadow cells and basaloid cells in varying proportion along with nucleated keratinized cells.[2] Secondary reaction in the form of giant cells, calcification, chronic inflammatory cells, and amorphous debris can be seen.[2] The tumor can show a spectrum, depending on the age of the lesion and site of aspiration.[3] Long-standing tumors usually show a predominance of ghost cells and anucleate squamous cells, whereas basaloid cells are the major component in tumors of shorter duration.[3] In addition, the smears sampled from periphery of the tumor are richer in basaloid cells as opposed to ghost cells, leading to a diagnostic difficulty.[3]

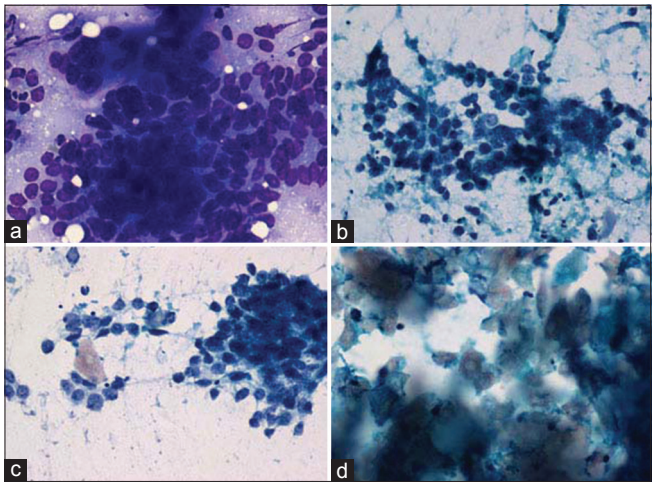

Figure 1: (a) Cellular smear showing sheets of cells with high nucleo-cytoplasmic ratio and hyperchromatic round nuclei (Giemsa, ×400). (b) Basaloid cells with necrosis in the background (Papanicolaou, ×400). (c) Shadow cells and basaloid cells (Papanicolaou, ×400). (d) Clusters of anucleate squamous cells and ghost cells (Papanicolaou, ×400)

The triad of basaloid cells, squamous cells, and the characteristic shadow or ghost cells allows a confident diagnosis of PMX.[4] However, the diagnostic accuracy of PMX on FNAC is low and varies from 21% to 44% in different studies.[4] High cellular yield, basaloid cells with high nucleo-cytoplasmic ratio, numerous mitotic figures, and a background rich in debris that resembles tumor necrosis can mimic a malignant adnexal tumor or squamous carcinoma, while the smears showing a predominance of anucleated and nucleated squamous cells can be confused with benign lesions such as epidermal or trichilemmal cyst.[5]

In conclusion, clinical examination, proper sampling from multiple sites within the lesion, and a careful search for the various components can aid accurate diagnosis.

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Conflicts of interest

There are no conflicts of interest.

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