Quiz Case

Ulcerated scalp nodule in elderly female: Cytomorphological clues and pitfalls for diagnosis

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A 63-year-old female with ulcerated scalp swelling (2.0 × 2.0 cm × 2.0 cm, not attached to the underlying bone, without regional lymphadenopathy) since 2 years with frequent bleeding on trivial trauma. Fine-needle aspirate showed features as shown in Figure 1.

**Figure 1**: FNA aspirate showing squamous and basaloid cells (a, PAP ×100; b, MGG ×100) with blotchy keratinous material (c, MGG ×100). Squamous cells without atypia showed moderate cytoplasm. (d, MGG ×100).

**QUESTION**
Q1: What is your interpretation?
- Ulcerated pilar cyst
- Pilomatrixoma
- Trichoepithelioma
- Proliferating trichilemmal tumor (PTT)
- Squamous cell carcinoma

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ANSWER

d. Proliferating trichilemmal tumor.

Explanation: The fine-needle aspiration cytology (FNAC) smears were moderately cellular and showed anucleate and nucleated squamous cells, basaloid cells [Figure 1a], abrupt keratinization [Figure 1b], and blotchy keratinous material [Figure 1c]. Squamous cells did not show any significant cytological atypia [Figure 1d]. The basaloid cells and squamous cells were almost equal in proportion. The basaloid cells did not show any peripheral palisading. Ghost cells, calcification, cholesterol clefts, and foreign body giant cells were absent. A diagnosis of low-grade squamous neoplasm was rendered.

FOLLOW-UP OF PRESENT CASE

Wide local excision was advised for histopathological confirmation. On gross examination, the lesion was partly skin-covered; nodular, measuring 2.5 × 2.0 × 2.0 cm. The overlying skin was ulcerated. On the cut section, the tumor was solid and grayish-white. Microscopy revealed a lobulated intradermal mass of squamous epithelium [Figure 2]. Widespread trichilemmal keratinization was noted along with the absence of a granular cell layer [Figure 3]. The squamous cells did not show any atypia or mitotic figures. The diagnosis of a low-grade (benign) proliferating trichilemmal tumor was rendered. Post-surgery, 2 years follow-up did not show any recurrence.

During fine-needle aspiration cytological evaluation of any skin nodule, the following differential diagnoses should be considered.

a. Pilar cyst: Pilar cyst is defined as a cyst containing keratin and its breakdown products. It arises preferentially in areas of high hair follicle concentrations; therefore, 90% of cases occur on the scalp. They are solitary in 30% of cases and multiple in 70% of cases. These are cystic nodular lesions with a smooth external surface. Young pilar cysts show abundant blotchy keratin with or without calcification and inflammation. Older cysts show necrotic debris with cholesterol crystals and inflammatory cells.

b. Pilomatrixoma is a benign cutaneous adnexal tumor having differentiation toward the hair follicle matrix with a predilection for the head-and-neck region of children and young adults. However, a bimodal pattern with the first peak in the first decade and the second in the sixth decade of life, along with a female preponderance is observed. Smears of pilomatrixomas are moderately cellular and comprised primarily of dense clusters of small- and medium-sized basaloid cells with overlapping nuclei, sheets of ghost cells, nucleate and anucleate squamous cells, and keratin fragments. The background is dirty and rich in granular keratin and shows many multinucleated giant cells. PTT generally does not show many multinucleate giant cells. Ghost cells characteristic of pilomatrixoma is not seen in PTT.

c. Conventional trichoepithelioma is usually seen in children and young adults as multiple, small, 2–4 mm papules. Giant solitary trichoepithelioma, however, occurs in elderly individuals and arises most commonly on the thigh and perianal region. On fine-needle aspiration cytology, it shows fronds of basaloid epithelial cells with abrupt keratinization, papillary mesenchymal body, and melanin pigmentation. Although the present lesion also showed basaloid cells clusters with abrupt keratinization and melanin pigment, it did not show mesenchymal bodies.
d. Proliferating trichilemmal tumor (PTT), also referred to as proliferating pilar tumor (PPT), is a tumor originating from the outer root sheath of a hair follicle. The histologic hallmark of PTT is the presence of trichilemmal keratinization. It most commonly occurs on the scalp during the 4th–8th decades of life with a distinct predilection for women. Wilson-Jones first described PTT in 1966 as an entity that can clinically and histologically simulate squamous cell carcinoma (SCC). A clinicopathological study of 76 cases divided PPT into three groups on the degree of stromal invasion and the level of cellular atypia. Group 1 lesions (PPTs) behave benignly, Group 2 tumors (low-grade malignant PTT -LMPPTs) have a small risk of local recurrence, and Group 3 neoplasms (high-grade malignant PTT – HMPPPTs) have the potential for regional recurrence and metastasis. Low- and high-grade malignant PTT shows additional marked nuclear anaplasia. The histological features are well recognized. However, characteristic fine-needle aspiration cytological findings of proliferating trichilemmal tumors are documented by a few authors only. On cytology, diagnosis of PTT is sometimes difficult and misdiagnosed as adnexal neoplasm.

The diagnosis of SCC was ruled out as squamous cells did not show any cellular atypia, pleomorphism, dyskeratotic cells, or tumor diathesis. Reactive epithelial atypia in inflamed pilar cysts may appear worrisome and raise the suspicion of SCC.

For cytological diagnosis of PTT, smears should show the presence of blotchy keratin, basaloid cells, squamous epithelial cells, and trichilemmal keratinization. However, these features may not be present in smears always and may lead to diagnostic dilemmas.

The presence of keratin material only may lead to misdiagnosis of epidermoid cysts or pilar cysts. Reactive epithelial atypia in inflamed cysts can look worrisome. Smears with basaloid cells with abrupt keratinization may get erroneously diagnosed as trichoepithelioma or keratotic BCC.

It is not possible to differentiate on FNAC between benign and low-grade malignant PTT as smears in both have similar cytomorphological features. However, cytology of high-grade malignant PTT shows trichilemmal keratinization, blotchy keratin, basaloid cells, and atypical squamous epithelial cells.

**SUMMARY**

The cytological diagnosis of PTT can be made in the presence of blotchy keratin, basaloid cells, squamous epithelial cells, and trichilemmal keratinization. However, these features may not be present in cytological smears and may lead to diagnostic dilemmas. Furthermore, the distinction between benign PPT (Group I) and low malignant PTT (Group II) is not possible on FNAC alone. FNA plays an important role to exclude SCC and high malignant PTT and to decide surgical management. PTT without atypia has a benign behavior, wide local excision of the lesion is recommended to prevent a recurrence.

**COMPETING INTEREST STATEMENT BY ALL AUTHORS**

The author declared that there are no competing interests by anyone.

**AUTHORSHIP STATEMENT BY ALL AUTHORS**

Conception, design, and data acquisition is done by author and also revised it critically.

**ETHICS STATEMENT BY ALL AUTHORS**

Being quiz case without identifiers, approval from Institutional Review Board is not required. Author is currently working as Associate Professor Department of Pathology ,Birsa Munda Government Medical College , Shahdol, Madhya Pradesh,India.

**LIST OF ABBREVIATIONS (In alphabetic order)**

- BCC – Basal cell carcinoma
- FNA – Fine needle aspiration
- FNAC – Fine needle aspiration cytology
- HMPPPT – High grade malignant proliferating trichilemmal tumor
- LMPPPT – Low grade malignant proliferating trichilemmal tumor
- PTT – Proliferating trichilemmal tumor
- SCC – Squamous cell carcinoma

**EDITORIAL/PEERREVIEW STATEMENT**

To ensure the integrity and highest quality of CytoJournal publications, the review process of this manuscript was conducted under a double-blind model (authors are blinded for reviewers and vice versa) through an automatic online system.

**REFERENCES**

1. Folpe AL, Reisenauer AK, Mentzel T, Rütten A, Solomon AR. Proliferating trichilemmal tumors: Clinicopathologic evaluation is a guide to biologic behavior. J Cutan Pathol 2003;30:492-8.
2. Julian CG, Bowers PW. A clinical review of 209 pilomatrixomas.
J Am Acad Dermatol 1998;39:191-5.
3. Bansal C, Handa U, Mohan H. Fine needle aspiration cytology of pilomatrixoma. J Cytol 2011;28:1-6.
4. Krishnamurthy J, Divya KN. The cytology of giant solitary trichoepitheliomas. J Cytol 2010;27:99-101.
5. Shet T, Rege J, Naik L. Cytodiagnosis of simple and proliferating trichilemmal cysts. Acta Cytol 2001;45:582-8.
6. Brownstein MH, Arluk DJ. Proliferating trichilemmal cyst: A simulant of squamous cell carcinoma. Cancer 1981;48:1207-14.
7. Ye J, Nappi O, Swanson PE, Patterson JW, Wick MR. Proliferating pilar tumors: A clinicopathologic study of 76 cases with a proposal for a definition of benign and malignant variants. Am J Clin Pathol 2004;122:566-74.
8. Kini JR, Kini H. Fine-needle aspiration cytology in the diagnosis of malignant proliferating trichilemmal tumor: Report of a case and review of the literature. Diagn Cytopathol 2009;37:744-7.
9. Uppada R, Rout S, Bora N, Pullela RV. An interesting case report of ulcerated proliferating pilar tumor (PPT) mimicking squamous cell carcinoma. J NTR Univ Health Sci 2014;3:111-3.

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