Axillary apocrine adenocarcinoma in a young male suspected initially on fine-needle aspiration cytology

ABSTRACT
Primary apocrine sweat gland adenocarcinomas are a rare entity, with only a few case reports so far. Many of these carcinomas are slow-growing with a high recurrence rate. A distinct cytological diagnosis can be made, and metastatic adenocarcinomas are always considered as a differential diagnosis on cytology. Our case was a 35-year-old male who presented with a discharging axillary sinus and swelling for the past 1 year. A clinical suspicion of tuberculous sinus was raised that however, remained unsupported by laboratory investigations. There was quite a high suspicion of apocrine adenocarcinoma on cytological examination that was confirmed by histopathology and immunohistochemistry. The patient was successfully treated with total excision and a wide margin. We report this case in view of its rarity and its occurrence in a 35-year-old young male, and emphasize that an initial cytological suspicion should be raised for primary apocrine adenocarcinoma in case of an axillary tumor, especially keeping in consideration the poor prognosis of the same and chances of early metastasis.

Key words: Axilla, cytology, primary apocrine adenocarcinoma, young male

Introduction
Primary apocrine adenocarcinomas are uncommon malignant cutaneous neoplasms commonly involving the axilla; however, other sites such as the eyelid, ear, scalp, anogenital region, chest, foot, lip, and breast can be affected.[1] Most of these lesions are indolent with cases of relapse and a high local recurrence rate of 28%.[2] Cases of lymph node, pulmonary as well as bone metastasis have been reported.[3,4] A confirmed clinical diagnosis can rarely be made alone. A cytological diagnosis followed by histopathology is necessary for confirmation. There are only a handful of cases describing the cytological features of this neoplasm.[5] Here, we report a case that mimicked tuberculous sinus, clinically, and turned out to be primary apocrine adenocarcinoma on cytology as well as histopathology.

Case Report
A young male aged 35 years presented to the surgery outpatient department with a swelling in the right axilla for the past 1 year. The swelling had a gradual onset and slow progression. There was history of pus being discharged from the swelling. The patient denied any history of weight loss, decreased appetite, night sweats, tuberculosis, diabetes, or hypertension. He was a nonsmoker, nonalcoholic, and had no family history of malignancy.
On examination, the patient was afebrile with a firm-to-hard swelling in the right axilla. The swelling was 3 × 2 cm in size with a sinus discharging pus-like material and pale granulation tissue. It was tender and warm. Bilateral breast examination and contralateral axilla were unremarkable. There were no palpable lymph nodes.

A clinical suspicion of tuberculous sinus was kept in mind.

Preliminary investigations to rule out tuberculosis were all negative including the Mantoux test, sputum for acid-fast bacilli, and chest radiograph. Routine hematological and biochemical investigations were also within normal limits. Culture and sensitivity of pus discharge revealed aerobic Enterobacter species.

Fine-needle aspiration cytology yielded pus like aspirate and on May-Grünwald-Giemsa (MGG) staining revealed cellular smears, showing atypical epithelial cells arranged in papillary clusters, sheets, and acini with nuclear overcrowding and overlapping [Figure 1a]. The cells showed a moderate amount of cytoplasm, high nuclear-cytoplasmic ratio, mild anisonucleosis and hyperchromasia with prominent nucleoli. The cytoplasm showed apocrine changes at places within the columnar cells [Figure 1b]. The background comprised foamy macrophages and hemorrhage. An impression of a malignant epithelial lesion favoring adenocarcinoma with apocrine and cystic change was made.

A subsequent biopsy revealed two grayish brown soft tissue pieces measuring 0.7 cm and 0.9 cm. Microscopy showed ulcerated squamous lining of the skin [Figure 1c]. The immediate subepidermis and dermis showed infiltration by tumor cells arranged in a glandular pattern with the large cells having a variable amount of cytoplasm. The nuclei were large, pleomorphic and vesicular with prominent nucleoli. Mitotic figures were infrequent. Lumina of some of the glands showed evidence of decapitated apocrine secretions [Figure 1d].

The cytoplasm of tumor cells as well as luminal secretions were positive for periodic acid-Schiff (PAS) stain [Figure 2a]. Immunohistochemically, the tumor cells were strongly positive for pancytokeratin (PanCK) and carcinoembryonic (CEA) antigen [Figures 2b and c, respectively]. A final histopathological diagnosis of primary apocrine adenocarcinoma was thus ascertained.

The tumor was excised with a wide surgical margin and the patient was followed up for 6 months without any recurrence.

**Discussion**

Sweat gland apocrine adenocarcinoma is a rare entity, with only few case reports so far.[6] Those in the fifth to seventh decades of their lives constitute the most common age group of diagnosis.[7] Most neoplasms are slowly progressive, small in size, and are most frequently seen in the axilla.[4,8] They can be recurrent and metastasize to the lymph node, lung, and bone.[2-4]

Cytological diagnosis of a primary apocrine adenocarcinoma is difficult as the differential diagnosis always includes metastatic carcinoma, carcinoma arising in ectopic breast tissue, and extramammary Paget’s disease.[4] However, a high suspicion of apocrine adenocarcinoma, as in our case, can
prove to be helpful to the surgeon in establishing the patient management plan.

Histologically, it has glandular structures with apocrine features and decapitation secretions. There is cytoplasmic PAS positivity of the tumor cells.\(^{9,10}\) The presence of neoplastic glands high in the dermis and immediate subepidermis favors the primary origin of tumor cells from apocrine sweat glands, as was the case in our patient.\(^{9}\) Apocrine adenocarcinomas are positive for cytokeratins, carcinoembryogenic antigen (CEA) and epithelial membrane antigen (EMA) as well as gross cystic disease fluid protein (GCDFP).\(^{4}\)

Apocrine adenocarcinoma has poor prognosis and the prognostic factors include size, histological type, lymph node involvement, and distant metastasis. The 10-year disease free survival rate in the absence of metastasis to the lymph nodes is 56%.\(^{3}\)

The treatment of choice is wide local excision with clear margins, with or without regional lymph node dissection.

A broad spectrum of both clinical and pathological, benign malignant differential diagnoses can be considered. Benign axillary lymphadenopathy was the initial clinical diagnosis made in this case, most likely of a tuberculous etiology. However, the suspicion was ruled out after unpromising investigations. Among the malignant disorders, lymphomas could have been considered but were ruled out by a negative personal history of weight loss/malaise/fever and absence of multiple lymphadenopathy or bilaterality. Possibility of male breast cancer or metastatic adenocarcinoma from the lung, prostate, GIT etc., was also considered initially but the suspicion was ruled out in the absence of any supportive clinicoradiological data.\(^{4}\) Hence, a diagnosis of primary apocrine adenocarcinoma was made in light of the above discussion.

**Conclusion**

Primary apocrine adenocarcinomas are rare malignant cutaneous tumors. The presentation of primary apocrine adenocarcinoma as an axillary swelling with a discharging sinus is uncommon. The mean age of presentation has been around 60 years in various case reports but our case was a young male. Initial diagnosis on cytological assessment has been dubious so far in the literature but was quite diagnostic and raised a high suspicion of adenocarcinoma with apocrine change, as in our case. Histopathology and immunohistochemistry are confirmatory. Reporting of such entities enhances the knowledge of its varied presentations, important diagnostic tools, prognostic factors, and further establishment of therapeutic regimes.

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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Brichkov I, Daskalakis T, Rankin L, Divino C. Sweat gland carcinoma. Am Surg 2004;70:63-6.
2. Cooper PH Carcinomas of sweat glands. Pathol Annu 1987;1:83-124.
3. el-Domeiri AA, Brasfield RD, Huvos AG, Strong EW. Sweat gland carcinoma: A clinico-pathological study of 83 patients. Ann Surg 1971;173:270-4.
4. Chamberlain RS, Huber K, White JC, Travaglino-Parda R. Apocrine gland carcinoma of the axilla: Review of the literature and recommendations for treatment. Am J Clin Oncol 1999;22:131-5.
5. Pai RR, Kini JR, Achar C, Rau A, Kini H. Apocrine (cutaneous) sweat gland carcinoma of axilla with signet ring cells: A diagnostic dilemma on fine-needle aspiration cytology. Diagn Cytopathol 2008;36:739-41.
6. Pucevich B, Catinchi-Jaime S, Ho J, Jukic DM. Invasive primary ductal apocrine adenocarcinoma of axilla: A case report with immunohistochemical profiling and a review of literature. Dermatol Online J 2008;14:5.
7. Miyamoto T, Hayari Y, Inone S, Watanabe T, Yoshino T. Axillary apocrine carcinoma with benign apocrine tumours: A case report involving a pathological and immunohistochemical study and review of the literature. J Clin Pathol 2005;58:757-61.
8. Roy SH, Shati QN, Rose MG. Locally recurrent and metastatic apocrine-gland carcinoma in an elderly man. Nat Clin Pract Oncol 2007;4:56-9.
9. Elder DE, Elenitsas R, Johnson BL Jr, Murphy GF, Xu G. Carcinoma of apocrine glands. In: Lever’s Histopathology of the Skin. 10th ed. Philadelphia: Lippincott Williams & Wilkins; 2008. p. 895-6.
10. Zehr KJ, Rubin M, Ratner L. Apocrine adenocarcinoma presenting as a large ulcerated axillary mass. Dermatol Surg 1997;23:585-7.