OLGU SUNUMU CASE REPORT

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# Primary Adenoid Cystic Carcinoma of the Skin: A Rare Case

## Derinin Primer Adenoid Kistik Karsinomu: Nadir Olgu

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**ABSTRACT** Adenoid cystic carcinoma is a malignant lesion that frequently occurs in the salivary glands and is rarely seen as a primary tumor of the skin. Although it is typically observed on the face, head, and neck area, especially the scalp, it is very rarely found in the extremities. The morphological characteristics are identical to those observed in adenoid cystic carcinoma originating from other anatomical locations for definitive diagnosis, cutaneous spread of malignant salivary gland tumor and skin metastasis of primary tumor in other sites must be excluded. We present here a case of primary adenoid cystic carcinoma of the skin that developed in the left knee region of a 68-year-old female patient.

**Keywords:** Carcinoma, adenoid cystic; skin neoplasms

**ÖZET** Adenoid kistik karsinom, sıklıkla tükürük bezlerinde karşımıza çıkan nadiren derinin primer tümörü olarak izlenen malign bir lezyondur. Genellikle kafa derisi başta olmak üzere yüz, baş-boyun bölgesinde görülmesine karşın ekstremitelerde oldukça az görülür. Morfolojik özellikleri diğer anatomik bölgelerden köken alan adenoid kistik karsinomlarda gözlenen özelliklerle aynıdır. Kesin tanı için malign tükürük bezi tümörünün kutanöz yayılımı ve başka lokalizasyonlardaki primer tümörün deri metastazının dışlanması gerekir. Biz burada 68 yaşında kadın hastanın sol diz bölgesinde gelişen derinin primer adenoid kistik karsinom olgusunu sunuyoruz.

**Anahtar Kelimeler:** Karsinom, adenoid kistik; deri tümörleri

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Primary adenoid cystic carcinoma of the skin (PACCS) was first described by Boggio in 1975. It is a rare, slowly progressing malignant lesion.[1] While adenoid cystic carcinoma (ACC) is most commonly seen in the salivary glands, it can also occur in various locations such as the breast, uterus, cervix, lacrimal glands, bronchi, and skin tissue.[2] Although its histogenesis is not precisely known, it is believed to originate from apocrine glands.[3] It is classified under adnexal tumors in the World Health Organization (WHO) classification of skin tumors. The definitive diagnosis of PACCS is made when typical histological features are present and metastatic disease is excluded.[4]

## CASE REPORT

A 68-year-old female patient was admitted to our hospital with a slow-growing red-purple nodule-like swelling on her left knee that had been developing for approximately one year. A systemic examination revealed no swelling or symptoms elsewhere on her body. The nodular lesion on the patient's knee was surgically removed and sent to our pathology unit.

Macroscopically, there were two fragmented skin-subcutaneous tissues with diameters of 3.5 cm and 2 cm. The cut surface appeared partially nodular and gray-cream colored. A lobular lesion located in the dermis was observed in the hematoxylin-eosin

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(H.E.) sections. The lesion showed basaloid cell proliferation, predominantly in a cribriform pattern and occasionally in solid, glandular, pseudocystic, and tubular patterns (Figure 1). The tumor consisted of 2 types of cells: angulated cells with narrow eosinophilic cytoplasm and cells with moderate eosinophilic cytoplasm and oval or round nuclei. Neoplastic cells exhibited low-grade cytological atypia and 5-6 mitotic figures per 10 high-power fields (Figure 2). Cystic spaces filled with basophilic material and basement membrane-like hyaline material surrounding pseudoluminal structures were noted. Histochemically, the basement membrane-like hyaline material stained with periodic acid-Schiff (PAS) and PAS plus diastase (Figure 3). Immunohistochemically , S100, spinal muscular atrophy (SMA), and p40 were positive in myoepithelial cells, while cytokeratin 7 and poly carcinoembryonic antigen (CEA) were positive in luminal cells surrounding the channels (Figure 4). Both cell types stained with PanCK and CD117. No perineural or lymphovascular invasion was detected. The tumor extended to the surgical margins.

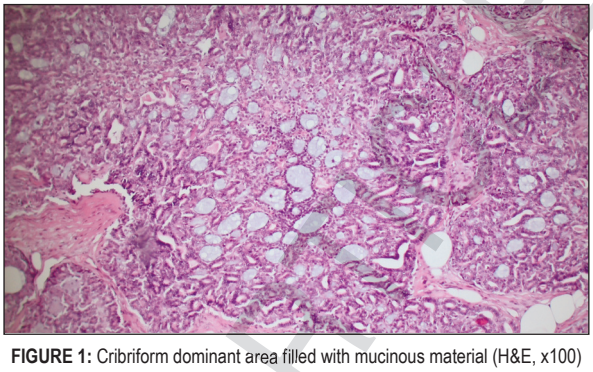

**FIGURE 1:** Cribriform dominant area filled with mucinous material (H&E, x100)

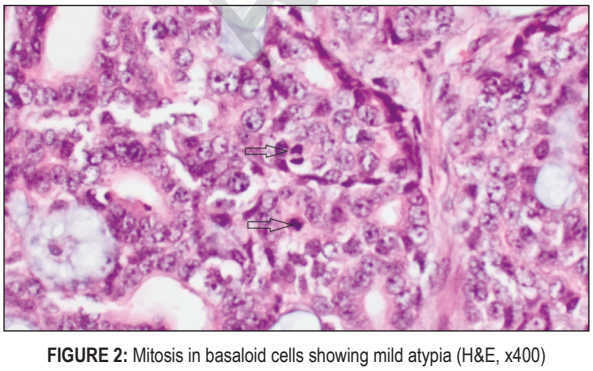

**FIGURE 2:** Mitosis in basaloid cells showing mild atypia (H&E, x400)

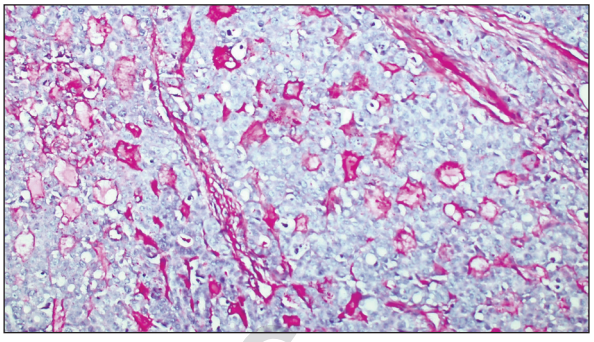

**FIGURE 3:** Basal membrane-like hyaline material with PAS staining (x200)

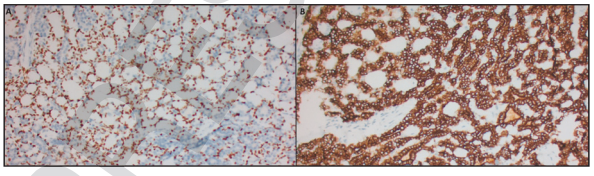

**FIGURE 4**: **A)** Myoepithelial cells with p40 staining; **B)** Diffuse cytoplasmic staining in luminal epithelial cells with cytokeratin 7 (x200)

Our report stated that after excluding ACC metastases originating from the salivary gland and upper respiratory system, this case could be considered PACCS of the skin. Following detailed clinical examination and radiological imaging, no other tumors were found in the patient. Thus, it was accepted as PACCS, and re-excision was performed due to positive surgical margins. No recurrence, lymph node, or distant organ metastasis was observed during 12 months of regular follow-up. The patient's follow-up continues.

An informed consent form was obtained from the patient.

## DISCUSSION

PACCS is a rare, locally aggressive malignant skin adnexal tumor.[2,5] It typically presents as a slow-growing nodule in the seventh decade of life, with a slight female predominance.[3] While it most commonly occurs on the scalp and face, the incidence decreases with distance from these regions, making its appearance on the extremities quite rare.[2] In our 68-year-old female patient, the lesion was located on the skin of the lower extremity, specifically the knee, which is an uncommon site.

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Histologically, PACCS appears as a poorly circumscribed dermal lesion. It is characterized by a cribriform pattern, as well as glandular, cystic, and tubular cell arrangements. There is no connection to the epidermis.[5] The cells have narrow cytoplasm and basophilic nuclei, with rare mitotic figures.[3] According to the WHO, PACCS consists of nodular lesions extending into the dermis and/or subcutis, featuring small ducts and pseudocysts lined by inner luminal epithelial cells and outer basal myoepithelial cells. Intraluminal secretions may be observed, with pseudocysts being larger than ducts. Staining with Alcian blue (AB) reveals extensive basophilic mucinous material, while PAS staining highlights hyalinized eosinophilic material.[3]

Seab et al. outlined the following diagnostic criteria for PACCS: 1) The lesion should be dermally located, composed of basaloid cells exhibiting a cribriform pattern, at least focally. 2) It should contain stromal hyalinization and/or basophilic mucinous areas, with tubular structures having sialomucinous glandular spaces. 3) Cutaneous metastasis from salivary gland lesions should be excluded. Our case met all these criteria, presenting a dermal lesion with predominant cribriform and tubular patterns, accompanied by basement membrane-like material and mucin.[6]

Batsakis et al. proposed grading these lesions based on certain criteria, including the presence of solid areas.[7] Grade 1 lesions consist of tubular and cribriform patterns without solid areas, showing minimal cytological atypia and few or no mitotic figures. Grade 2 lesions exhibit cribriform or mixed patterns with less than 30% solid areas and slightly more pronounced cytological atypia. Grade 3 lesions have over 30% solid areas, often accompanied by necrosis, with marked cytological atypia and mitotic activity. Our case, with less than 30% solid areas (20% solid area), 5-6 mitoses per 10 high-power fields, and no necrosis, was classified as grade 2.

Immunohistochemically, neoplastic cells show diffuse cytoplasmic staining for keratins, CAM 5.2, and CK7, with variable staining for CK5/6 and D2-40. Ductal cells express EMA, CEA, and CK15, while myoepithelial cells express SMA, p63, vimentin, calponin, and SOX10. CD117 (c-KIT) is positive in all cases.[4] Approximately half of the cases exhibit perineural invasion, with 76% of patients showing local recurrence also presenting perineural invasion.[3,5] Local recurrence occurs in about 50% of cases, while lymphatic and hematogenous spread is rare.[8] Regional lymph node invasion and distant metastasis to organs such as the lungs are infrequent.[3] Compared to PACCS, ACC of other sites have higher rates of local recurrence and metastasis.[8] Our case did not exhibit perineural or lymphovascular invasion, suggesting a better prognosis. The patient continues regular follow-up.

Before diagnosing primary PACCS, it is essential to exclude cutaneous metastasis from ACC of other organs. Differential diagnoses include adenoid cystic variant basal cell carcinoma (BCC), mucinous carcinoma of the skin, cylindroma, and primary cribriform apocrine carcinoma of the skin[5,8]. BCC can be distinguished by peripheral palisading, connection to the epidermis, retraction artifact, and lack of perineural invasion. Mucinous carcinoma of the skin is characterized by small cell clusters and cribriform pattern morphology within mucin pools. Cylindroma consists of basaloid cell islands surrounded by hyalinized material.[8] Primary cribriform apocrine carcinoma of the skin features cells with pleomorphic nuclei and a predominant cribriform pattern, with rare perineural invasion.[5] In our case, histological and immunohistochemical analysis facilitated clear differentiation from these conditions.

Treatment involves wide surgical excision with at least a 2 cm tumor-free margin to reduce the risk of local recurrence, followed by long-term follow-up.[2,5] According to the Surveillance, Epidemiology, and End Results program, PACCS and breast ACC exhibit less aggressive behavior and better prognosis compared to ACC of the lung, bronchi, eyes, and optic structures.[9] The initial biopsy of our patient showed tumor continuity at the surgical margin. A re-excision with a 2 cm safe margin was performed. During the 8-month follow-up period, no local recurrence or metastasis was observed.

In conclusion, PACCS is a very rare malignant skin adnexal tumor. For a definitive diagnosis, it is essential to first exclude the possibility of skin invasion by the salivary gland tumor and cutaneous metastases originating from ACC in other organs. Al-

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though the incidence of local recurrence, nodal and pulmonary metastases is low, reported cases require wide surgical excision and close follow-up with a tumor-free margin of 2 cm. We aimed to share this rare case by reviewing the literature by performing clinical and histopathological examination.


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### *Conflict of Interest*

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

### *Authorship Contributions*

***Idea/Concept:*** *Figen Aslan;* ***Design:*** *Figen Aslan, Sema Köse;* ***Control/Supervision:*** *Figen Aslan;* ***Data Collection and/or Processing:*** *Sema Köse;* ***Analysis and/or Interpretation:*** *Figen Aslan;* ***Literature Review:*** *Sema Köse;* ***Writing the Article:*** *Figen Aslan, Sema Köse;* ***Critical Review:*** *Figen Aslan.*


## REFERENCES


1. Boggio R. Letter: adenoid cystic carcinoma of scalp. Arch Dermatol. 1975;111(6):793-4. PMID: 1137427.
2. Dubin AH, Johnson Q, Horowitz J. Primary cutaneous adenoid cystic carcinoma of the back: a case report. Cureus. 2023;15(11):e49099. PMID: 38125236; PMCID: PMC10731834.
3. Płachta I, Kleibert M, Czarnecka AM, Spałek M, Szumera-Ciećkiewicz A, Rutkowski P. Current diagnosis and treatment options for cutaneous adnexal neoplasms with apocrine and eccrine differentiation. Int J Mol Sci. 2021;22(10):5077. PMID: 34064849; PMCID: PMC8151110.
4. Kazakov DV, Argenyl ZB, Brenne T. Malignant neoplasms arising from spiradenoma, cylindroma, or, spiradenocylindroma. In: Elder DE, Massi D, Scolyer RA, Willemze R, eds. WHO Classification of Skin Tumours. 4th ed. Lyon, France: IARC; 2018. p.172-73.
5. El Mansoury FZ, Messaoud O, Essaber H, Allioui S, El Bakkari A, Jerguigue H, et al. Primary cutaneous adenoid cystic carcinoma with lung metastasis: a case report with literature review. Radiol Case Rep. 2023;19(2):617-20. PMID: 38074440; PMCID: PMC10709116.
6. Seab JA, Graham JH. Primary cutaneous adenoid cystic carcinoma. J Am Acad Dermatol. 1987;17(1):113-8. PMID: 3038974.
7. Batsakis JG, Luna MA, el-Naggar A. Histopathologic grading of salivary gland neoplasms: III. Adenoid cystic carcinomas. Ann Otol Rhinol Laryngol. 1990;99(12):1007-9. PMID: 2173892.
8. Singh GK, Singh P, Kaur J, Kumar R. Lung metastasis in primary cutaneous adenoid cystic carcinoma-clinicopathological evaluation of a rare case with review of literature. J Egypt Natl Canc Inst. 2017;29(3):163-5. PMID: 28668494.
9. Li N, Xu L, Zhao H, El-Naggar AK, Sturgis EM. A comparison of the demographics, clinical features, and survival of patients with adenoid cystic carcinoma of major and minor salivary glands versus less common sites within the surveillance, epidemiology, and end results registry. Cancer. 2012;118(16):3945-53. PMID: 22179977; PMCID: PMC3412946.


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