# POROID SOLID-CYSTIC HIDRADENOMA – A TUMOR WITH A PARTICULAR BIPHENOTYPIC APPEARANCE AND A LITERATURE REVIEW

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**Summary**

*The solid-cystic poroid hidradenoma is an rare, benign, adnexal tumor originating from the eccrine sweat glands. It is well-circumscribed, firm and asymptomatic, with distinct microscopic features, including a combination of solid and cystic areas composed of poroid and cuticular cells. We report the case of a 59-year-old female patient who presented to the Dermatology Department with a cutaneous lesion on the left knee. The lesion measured 1 cm in diameter, was a etythematous, firm and non-tender nodule, with an progressively increased in size over approximately one year. The case was transfered to the Department of Plastic Surgery, where the lesion was completly excised and sent to the Department of Pathology for microscopic examination. Histopathological report confirmed the diagnosis of a solid-cystic poroid hidradenoma, highlighting its characteristic cellular components and eccrine differentiation. Given its rarity, this case contributes to the limited literature on this tumor variant and emphasizes the importance of microscopic examination in establishing an accurate diagnosis.*

***Keywords:*** *solid-cystic hidradenoma; poroma; hidradenoma; cutaneous lesion; cuticular cells; poroid cells.*

## Introduction

The solid-cystic poroid hidradenoma is a rare, benign adnexal tumor originating from the eccrine sweat glands, with a predominant occurrence in females and an age range between 15 and 90 years. It is most commonly found on the head and neck, extremities or axilla [1-5]. Although its exact etiology remain unclear, it is belived to arise from the terminal ductal portions of eccrine glands, with possible contributions from genetic mutation or chronic irritation [2].

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The incidence of poroid hidradenomas is extremly low, with only a limited number of cases reported in the literature [3]. Clinically, the differential diagnosis includes hidradenoma, trichilemmomas or clear cell hidradenoma, epidermal inclusion cysts and basal cell carcinoma, as these lesions may present with overlapping features [4,5]. For diagnosis, we can use immunohistochemistry, however, its useful only for confirming the cellular origin of the lesion, with markers such as CEA, EMA or p63. Currently, no specific immunohistochemical merker has been identified for poroid hidradenoma, making its diagnosis reliant on histopathological evaluation [1,6].

Given the rarity of this lesion, we present a case of poroid hidradenoma with a solid-cystic component. In this study, we raport a case of a 59-year-old female patient who presented to the Dermatology Department for the evaluation of a cutaneous lesion on the left knee, which had been present for approximately one year and had slowly increased in size, reaching 1 cm in diameter. The lesion was erythematous, firm, non-tender and immobile. Histopathological examination confirmed the diagnosis of solid-cystic poroid hidradenoma, emphasizing the importance of recognizing this rare adnexal tumor in clinical practice.

## Case presentation

In April 2024, a 59-year-old female patient presented to the Clinical Emergency County Hospital of Brăila, Romania, with a cutaneous lesion located at the level of the left knee. Initially, the lesion was clinically diagnosed as a hemangioma. Given the need for futher evaluation and definitive treatment, a surgical excision was performed and the resected specimen was sent for histopathological analysis.

On gross examination, the surgical speciment was described as an elliptical tegument measuring 4 × 2,5 × 1 cm, with an intact epidermal surface. A centrally located, slightly elevated area with a diameter of 1 cm was noted. On cut-section, underneath the epithelial layer, a unilocular cystic formation measuring 1,7 cm in diameter was identified. The cyst contained a gelatious material and exhibited a small intracystic papillary proliferation.

On microscopic examination, it was revealed a well-demarcated cystic lesion located within the dermis and subcutaneous tissue, without epidermal involvment, with a grenz zone present at dermo-epidermal junction. The cystic structure was predominantly lined by a single layer of cuboidal to columnar epithelium. At one pole of the lesion, there was an intracystic solid proliferation composed of uniform, small, cuboidal poroid cells with round nuclei. These cells exhibit focal formation of intracytoplasmatic lumina containing eosinophilic material. Additionally, cuticular cells with pale cytoplasm are interspersed within the lesion (Fig. 1).

The histopatological features are consistent with a solid-cystic poroid hidradenoma, a rare benign sweat gland tumor that belongs to the spectrum of poroid neoplasms. It combines characteristics of both hidradenoma and poroma, demonstrating a well-circumscribed, solid-cystic arhitecture with a dual cell population consisting of poroid and cuticular cells. The presence of ductal differentiation, with luminal formation and eosinophilic secretions, further supports its adnexal origin.

## Outcome and Follow-up

The lesion was completely excised with clear surgical margins, to date, no cases of recurrence have been reported in the literature. The patient was informed about the histopathological findings and clinical follow-up was recommended as a precautionary measure. The patient signed the informed consent regarding data publication.

## Discussions

Hidradenoma is a benign adnexal tumor of sweat gland origin, typically presenting as a well-circumscribed, solid or solid-cystic nodule within the dermis os subcutaneous tissue. It exhibits eccrine or apocrine differentiation and is composed of polygonal, clear or squamoid cells aranged in lobular or trabecular patterns, often with ductal structures and occasional mucinous or myxoid stromal changes [1- 5, 7].

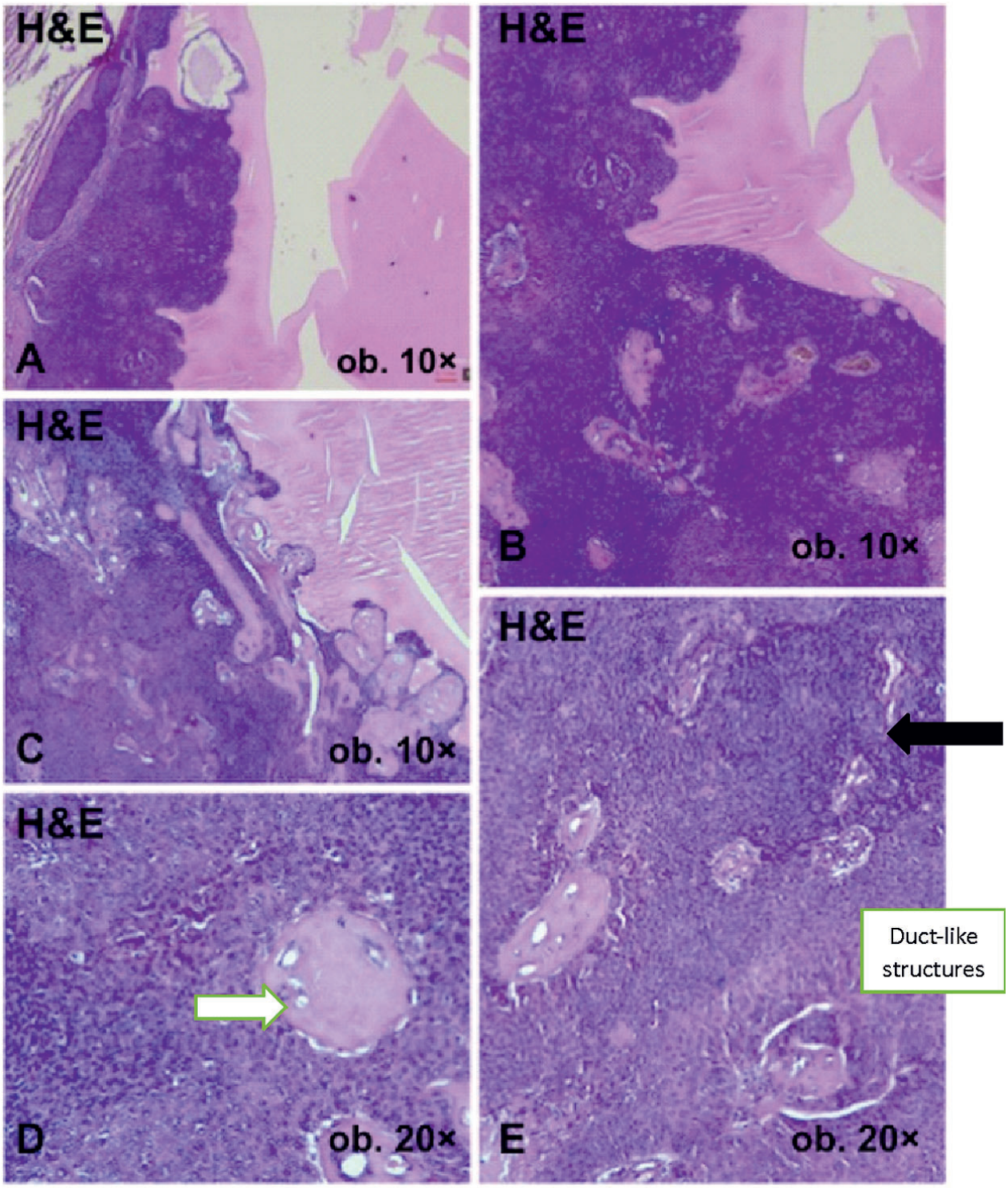


*Figure 1. H&E Stain, 10x,20x, the lesion is present at the level of the dermis.A,B,C) solid area with cystic formation, D,E) White arrow shows cuticular cells, with pale cytoplasm, while the black arrow highlights poroid cells.*

Poroma is a benign neoplasm arising from the intraepidermal portion of sweat gland ducts, primarly showing eccrine differentiation. It is composed of small, uniform poroid and cuticular cells forming well-demarcated nests or cords extending from the epidermis into the dermis, often associated with ductal lumina and a vascularized stoma [1-3, 8].

On the other hand, poroid hidradenoma is a rare, benign, adnexal tumor of sweat gland origin, classified within the hidradenoma neoplasm spectrum [5]. It shares morphological characteristics with both poroma and hidradenoma, demonstrating eccrine differentiation [1,2,4,9]. Histopathological studies suggest that these tumors arise from intraepidermal ductal components of sweat glands and undergo subsequent expansion into the dermis and subcutaneous tissue[8,9,10]. The presence of both poroid and cuticular cells, along with ductal differentiation supports the hypothesis of a dual lineage neoplasm originating from the terminal ductal segment of sweat glands [8,9]. Unlike classical poromas, witch are typically confined to the epidermis, poroid hidradenomas exhibit a well-circumscribed, predominantly dermal growth pattern, resembling nodular hidradenomas [1, 5-10].

While poroid hidradenomas generally present with a solid architecture, the presence of a proeminent cystic component, as observed in this case, is an uncommon histological feature. Cystic degeneration in adnexal tumors is generally attributed to ductal lumen expansion, degenerative changes or secretory activity within the lesion [1-5]. The formation of a well-defined unilocular cyst containing eosinophilic material, coupled with an intracystic papillary proliferation, represents a rare morphological variant. This feature may complicate the differential diagnosis, necessitating carefull histopathological evaluation to distinguish it from other cystic adnexal neoplasms, including mixed and dermal duct tumors [4, 11].

Poroid hidradenomas exhibit a biphenotypic differentiation, encompassing both poroid and cuticular cell components [1, 5]. Poroid cells, which are small, cuboidal and possess round nuclei with scant cytoplasm, represent the proliferative component of the lesion[1-6]. Cuticular cells, in contrast, exhibit paler cytoplasm and are thought to contribuite to structural support [1-5]. The coexistence of solid and cystic components, alongside ductal differentiation, supports the tumor′s complex histogenesis. Immunohistochemical studies have demonstrated that poroid cells typically express epithelial markers such as EMA and CEA, while cuticular cells mai show differentiation markers indivative of secretory function [1-4, 6,12].

Given its unique histological attributes, poroid hidradenomas must be carrefully differentiated from other adnexal neoplasms. The most relevant distinction lies in its biphenotypic nature, witch sets it apart from classic hidradenomas. While hidradenomas may exhibit both solid and cystic areas, they lack the characteristic poroid and cuticular differentiation [1-3]. Additionally, hidradenomas typically display a more uniform epithelial proliferation without the distinct dual-cell population seen in poroid hidradenoma [1-6, 8,12].

One important differential diagnosis is hidradenocarcinoma, the malignant counterpart of hidradenoma, which may exhibit overlapping features. However, hidradenocarcinomas demonstrate infiltrative growth patterns, cytological atypia, high mitotic activity and occasional necrosis, none of which are present in poroid hidradenoma [1].

Trichilemmomas also enter the differential spectrum due to their pale cell population exhibiting trichilemmal differentiation. However, trichilemmomas characteristicaly expand the follicular infundibulum, show peripheral palisading and are enclosed by a thickened basement membrane, which differentiates them from poroid hidradenoma [1-5].

Another diagnostic consideration is dermal duct tumors, which share eccrine differentiation features [1]. However, dermal duct tumors tend to have a more infiltrative growth pattern and are often composed of small ductal structures lined by cuboidal epithelium within a desmoplatic stroma, distinghuishing them from the well-cirbumscribed, lobular arhitechture of poroid hidradenoma [1].

Clear cell hidradenoma (CCH) also present a potential diagnostic challenge, given its arhitectural similarities to poroid hidradenoma. CCH

lacks a true poroid cell component and does nor exhibit biphenotypic differentiation[1]. Furthermore, CCH is more likely to display proeminent cystic degeneration with mucinous or myxoid stroma, features absent in poroid hidradenoma [1].

Also, basal cell carcinoma is included in the differential diagnosis of poroid hidradenoma because both lesions can present as well-circumscribed dermal nodules with a solid or cystic arhitecture. Histologically, basal cell carcinoma may mimic some features of poroid hidradenoma by exhibithing basaloid cells arranged in compact nests, however, it differs by showing peripheral palisading of cells, stromal retraction artifact and an infiltrative growth pattern [1-5].

The distinctive feature of the present case lies in the presence of a cystic cavity with an associated solid intracystic proliferation, as well as the poroid nature of the lesion, characterized bu the coexistence of both poroid and cuticular cell types. Its exclusive localization within the dermis and subcutaneous tissue, without epidermal involvment, represents a distinguishing characteristic from classic poromas [1]. Furthermore, the focal formation of intracystic lumina filled with eosinophilic material suggests a degree of functional differentiation, further supporting its adnexal origin [1,13,14].

## Conclusion

This case highlights a rare morphological variant of poroid hidradenoma with cystic transformation and intrachystic proliferation. The unique arhitectural and cytological characteristics support its classification within the poroid neoplasm spectrum, while emphasizing the importance of distinguishing it from other adnexal tumors. Given the absence of reported recurrences in the literature, complete surgical excision remains the standard of care, ensuring an excellent prognosis.

## Bibliography


1. *WHO Classification of Tumos- skin tumors* (5th edition); 2019; 185-188.
2. *McKee s Pathology of the Skin, 5th edition*, 2019, 1616-1617; 1638-1639.
3. *Lever s Histopathology of the skin* by Davin E. Elder, 1999, 868, 877, 885-887.
4. www.PathologyOutlines.com, Skin nonmelanocytic tumor, Adnexal Tumors, Hidradenoma.
5. Poroid Hidradenoma Revisited, M Khushpreet Kaur, Prashant Verma, et al; 2022; Indian *Journal of Dermatology;* May-Jun;67(3):305–306 doi: 10.4103/ijd.IJD_210_17
6. A reddish nodule with viscous fluid secretion. Solid-cystic hidradenoma (SCH), Keisure Imafuku, Hiroo Hata, Chihiro Shiiya, et al., *International Journal of dermatology,* 2016, Feb;55(2):151-2. doi: 10.1111/ijd.12901.
7. Eccrine Poroma: Pathogenesis, New Diagnostic Tools and Associations with Porocarcinoma – A Review, Eirini Kyrmanidou, Christina Fotiadou, Christina Kermanetzi, et al., *Diagnostics* (Basel, Switzerland), 2023, Aug 16;13(16):2689. doi: 10.3390/diagnostics13162689.
8. Poroid hidradenoma of the scalp, Byung Duk Min, Chong Kun Lee, Chang Eun Chung, et al, Archives of craniofacial surgery, 2021 Jun;22(3):154-156. doi: 10.7181/acfs.2021.00101.
9. Barnhill s Dermatopathology, Fourth Edition, 2020, pag 728-729.
10. Poroid Hidradenoma: Case Report and Comprehensive Review of the Literature, Arrin Brooks, Mariah Morris, Jonathan Cuda, et al, *Case reports in dermatology,* 2023, Oct 25;15(1):202-216. doi: 10.1159/000531052.
11. Poroid Hidradenoma: A Rare Finger Lesion, Jana N Satma, Tara Chadab, Marina Landa, et al, *Cureus,* 2024, Sep 1;16(9):e68381.doi: 10.7759/cureus.68381.
12. Poroid Hidradenoma of the Scalp with Adipocitic Metaplasia – a rare entity, Rakesh Patkar, Amrita Neelakantan, Shilpa Mishra, *Indian Journal of Dermatopathology,* 2023, Sep-Oct;68(5):589. doi: 10.4103/ijd.ijd_430_23.
13. Solid-Cystic Hidradenoma: A dorsal Foot Presentation, Robert L B Sprinkle 3rd, Omar P Sangueza, Ashleigh Elizabeth Wells, *Journal of the American Podiatric Medical Association,* 2019, Sep;109(5):389-392. doi: 10.7547/17-136.

14. Poroid Hidradenoma: An Uncommon Cutaneous Adnexal Neoplasm, Piyush Kumar, Anupam Das, Sushil S Savant, *Indian Journal Of Dermatology,* 2017 Jan-Feb;62(1):105-107. Doi:10.4130/0019-5154.198041.

Conflict of interest
NONE DECLARED

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