

## Letter to Editor

# Apocrine hidrocystoma with mucinous metaplasia

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Hidrocystoma is a rare cystic lesion arising from the sweat glands, and is classified into apocrine and eccrine variants, with the majority being of apocrine nature [1]. It is usually found in the head and neck region, and commonly affects the periorbital area [1, 2]. Apocrine hidrocystoma is characterized histopathologically by the presence of a unilocular or multilocular cyst situated in the dermis, and the cyst wall is covered by a double layer of epithelial cells [1, 2]. The inner layer is composed of columnar cells with rich eosinophilic cytoplasm which shows luminal decapitation secretion, and the outer layer is consisted of flat myoepithelial cells [1, 2]. Occasionally, papillary projection of the epithelium into the lumen is observed, which is referred to as papillary apocrine gland cyst [1].

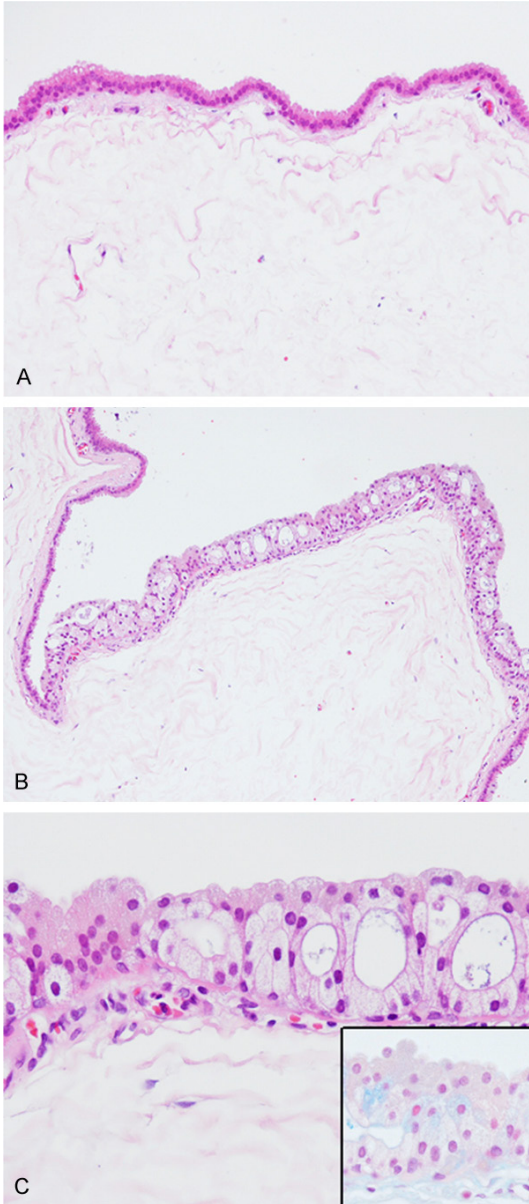
Mucinous metaplasia is an extremely rare phenomenon in the skin. In non-neoplastic skin, the most common lesion is mucinous syringometaplasia, which is characterized by the presence of epidermal invagination lined by non-keratinizing squamous cells and mucin-laden goblet-like cells accompanied by mucinous changes in the eccrine ducts [3-7]. This lesion is commonly seen in the plantar surface of feet and fingers [3-7]. Moreover, albeit extremely rare, non-neoplastic squamous epithelium with mucinous metaplasia of the external genitals has also been reported [8]. In neoplastic skin lesions, only a few cases of clear cell hidradenoma, hidradenocarcinoma, and *in situ* and invasive squamous cell carcinomas with mucinous metaplasia have been documented [9-14]. Herein, we report the first documented case of apocrine hidrocystoma with mucinous metaplasia and review the literature.

A 29-year-old Japanese female presented with a nodular lesion in the right subaural region, which had been noticed approximately 7 years earlier. Physical examination revealed a well-circumscribed elastic soft subcutaneous nodule, measuring 2 × 1.5 cm in diameter. Total resection of the nodule was performed under a clinical diagnosis of hemangioma.

Histopathological study of the resected specimen revealed a well-circumscribed unilocular cyst in the dermis. The cyst wall was lined by a double layer of epithelial cells (**Figure 1A**). The inner layer was composed of columnar cells with rich eosinophilic cytoplasm which showed luminal decapitation secretion, and the outer layer was consisted of flat myoepithelial cells (**Figure 1A**). Neither nuclear atypia nor mitotic figures were observed in these cells (**Figure 1A**). Focal papillary projection was seen within the cyst (**Figure 1B**). Columnar cells with clear cytoplasm were present in this portion as well as the typical eosinophilic columnar cells with decapitation secretion (**Figure 1C**). Neither nuclear atypia nor mitotic figures were observed in these clear cells (**Figure 1C**). Periodic acid Schiff (PAS) and Alcian blue-staining clearly demonstrated the presence of intracytoplasmic mucin in these columnar cells with clear cytoplasm (**Figure 1C**, inset).

Immunohistochemical studies were performed using an autostainer (Ventana) by the same method as previously reported [15-19]. Cytokeratin 7 was expressed in the columnar cells, but cytokeratin 20 was not. Gross cystic disease fluid protein (GCDFP)-15 was also diffusely positive in these columnar cells (**Figure 2**).

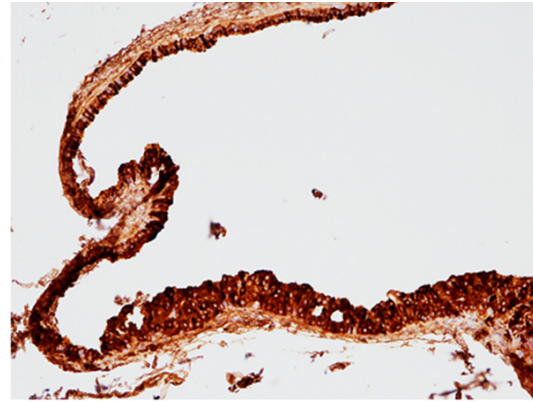
## Mucinous hidrocystoma



**Figure 1.** Histopathological features. A: A unilocular cyst is lined by a double layer of epithelial cells. The inner layer is composed of columnar cells with eosinophilic cytoplasm showing decapitation secretion, and the outer layer is consisted of flat myoepithelial cells. HE,  $\times 100$ . B: Focal papillary projection is noted. HE,  $\times 100$ . C: Columnar cells with clear cytoplasm are observed as well as eosinophilic cells showing decapitation secretion. HE,  $\times 400$ . The cytoplasm of the clear cells is positive for Alcian blue staining.  $\times 400$ .

Accordingly, an ultimate diagnosis of apocrine hidrocystoma with mucinous metaplasia was made.

Although normal human conjunctival epithelium has mucinous cells, none of these cells are



**Figure 2.** Immunohistochemical features. Gross cystic disease fluid protein-15 is diffusely expressed.  $\times 100$ .

observed in normal human skin. The presence of mucinous cells in non-neoplastic skin tissue and some kinds of cutaneous neoplasms is regarded as a metaplastic phenomenon [12]. Mucinous syringometaplasia is thought to be the result of long-standing pressure or trauma [3], and mucinous metaplasia of the external genital non-neoplastic squamous epithelium is also considered to be associated with chronic inflammation [8]. Moreover, only a limited number of cases of cutaneous neoplasms, such as hidradenoma, hidradenocarcinoma, and *in situ* and invasive squamous cell carcinoma, with mucinous metaplasia have been documented [9-14]. Mucinous metaplasia occurring in the above-mentioned lesions has been phylogenetically interpreted as an atavism, because mucinous cells are frequently observed in the apocrine glands of lower vertebrate and certain mammals [3]. Although only one case of eccrine mucinous metaplasia adjacent to apocrine hidrocystoma occurring in a 13-year-old girl has been reported [20], this case is the first documented case of apocrine hidrocystoma with mucinous metaplasia.

The mucin of the present case was considered as acid mucopolysaccharides because the mucinous cells were positive for both Alcian blue and PAS stainings. This finding corresponded to the histochemical analyses of the mucinous material of the previously reported cases of mucinous syringometaplasia and cutaneous neoplasms with mucinous metaplasia [3-9, 14, 20].

In conclusion, this case demonstrates that mucinous metaplasia occurs in apocrine hydro-

cystoma. Mucinous metaplasia is an extremely rare phenomenon in both non-neoplastic skin tissue and cutaneous neoplasms. Additional studies are needed to clarify the histogenesis and molecular mechanism of mucinous metaplasia of the skin.

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### References

- [1] McNiff J, McCalmont TH, Requena L, Sanguenza OP, Vassallo C, Rosso R, Borroni G, Glusac EJ, Pichardo RO. Benign tumours with apocrine and eccrine differentiation. In: LeBoit PE, Burg G, Weedon D, Sarasin A, eds. *World Health Organization Classification of Tumours. Pathology and Genetics of Skin Tumours*. Lyon: IARC Press, 2006. pp: 139-148.
- [2] Anzai S, Goto M, Fujiwara S, Da T. Apocrine hidrocystoma: a case report and analysis of 167 Japanese cases. *Int J Dermatol* 2005; 44: 702-703.
- [3] Banuls J, Ramon R, Silvestre JF, Alfonso R, Betlloch I, Botella R, Requena L. Mucinous metaplasia of apocrine duct. *Am J Dermatopathol* 1998; 20: 189-193.
- [4] Bergman R, David R, Friedman-Birnbaum R, Harth Y, Bassan L. Mucinous syringometaplasia: an immunohistochemical and ultrastructural study of a case. *Am J Dermatopathol* 1996; 18: 521-526.
- [5] Madison JF, Cooper PH, Burgdorf WHC. Mucinous syringometaplasia with prominent epithelial hyperplasia and deep dermal involvement. *J Cutan Pathol* 1990; 17: 220-224.
- [6] Hunt SJ, Abell E. Mucinous syringometaplasia mimicked by a clear cell hidradenoma with mucinous change. *J Cutan Pathol* 1991; 18: 339-343.
- [7] King DT, Barr RJ. Syringometaplasia: mucinous and squamous variants. *J Cutan Pathol* 1979; 6: 284-291.
- [8] Fang AW, Whittaker MA, Theaker JM. Mucinous metaplasia of the penis. *Histopathology* 2002; 40: 177-179.
- [9] Ishida M, Kojim F, Kushim R, Kakutani A, Okabe H. A case of clear cell hidradenoma with mucinous metaplasia in the forehead-immunohistochemical analysis of the mucin. *Rinsho Byori* 2006; 54: 781-784.
- [10] Wahl CE, Todd DH, Binder SW, Cassarino DS. Apocrine hidradenocarcinoma showing Paget's disease and mucinous metaplasia. *J Cutan Pathol* 2009; 36: 582-585.
- [11] Honda Y, Tanigawa H, Harada M, Fukushima S, Masuguchi S, Ishihara T, Ihn H, Iyama K. Hidradenocarcinoma showing prominent mucinous and squamous differentiation and associated pagetoid spread. *J Cutan Pathol* 2013; 40: 503-508.
- [12] Goh SGN, Carr R, Dayrit JF, Calonje E. Mucinous hidradenoma: a report of three cases. *J Cutan Pathol* 2007; 34: 497-502.
- [13] Fitzgibbon JF, Googe PB. Mucinous differentiation in adnexal sweat gland tumors. *J Cutan Pathol* 1996; 23: 259-263.
- [14] Friedman KJ, Hood AF, Farmer ER. Cutaneous squamous cell carcinoma with mucinous metaplasia. *J Cutan Pathol* 1988; 15: 176-182.
- [15] Ishida M, Iwai M, Yoshida K, Kagotani A, Okabe H. Sebaceous carcinoma associated with Bowen's disease: a case report with emphasis on the pathogenesis of sebaceous carcinoma. *Int J Clin Exp Pathol* 2013; 6: 3029-3032.
- [16] Toriyama A, Ishida M, Amano T, Nakagawa T, Kaku S, Iwai M, Yoshida K, Kagotani A, Takahashi K, Murakami T, Okabe H. Leiomyomatosis peritonealis disseminata coexisting with endometriosis within the same lesions: a case report with review of the literature. *Int J Clin Exp Pathol* 2013; 6: 2949-2954.
- [17] Ishida M, Hodohara K, Yoshida K, Kagotani A, Iwai M, Yoshii M, Okuno K, Horinouchi A, Nakanishi R, Harada A, Yoshida T, Okabe H. Occurrence of anaplastic large cell lymphoma following IgG4-related autoimmune pancreatitis and cholecystitis and diffuse large B-cell lymphoma. *Int J Clin Exp Pathol* 2013; 6: 2560-2568.
- [18] Ishida M, Yoshida K, Kagotani A, Iwai M, Yoshii M, Okuno K, Horinouchi A, Nakanishi R, Harada A, Yoshida T, Okuno T, Hodohara K, Okabe H. Anaplastic lymphoma kinase-positive large B-cell lymphoma: A case report with emphasis on the cytological features of the pleural effusion. *Int J Clin Exp Pathol* 2013; 6: 2631-2635.
- [19] Ishida M, Hodohara K, Yoshii M, Okuno H, Nakanishi R, Horinouchi A, Nakanishi R, Harada A, Iwai M, Yoshida K, Kagotani A, Yoshida T, Okabe H. Methotrexate-related Epstein-Barr virus-associated lymphoproliferative disorder occurring in the gingiva of a patient with rheumatoid arthritis. *Int J Clin Exp Pathol* 2013; 6: 2237-2241.
- [20] Jiang J, Petronic-Rosic V, Hoag J, Shea CR. Eccrine mucinous metaplasia associated with an apocrine cystadenoma. *J Cutan Pathol* 2005; 32: 307-309.