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Case Report

Primary Cutaneous Mucinous Carcinoma: A Case with Diagnostic Dilemma

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Abstract

Primary Cutaneous Mucinous Carcinoma (PCMC) is a rare adnexal malignancy with indolent behavior but significant diagnostic challenges, particularly in distinguishing it from metastatic mucinous adenocarcinoma. We report a diagnostically complex case of PCMC in a 43-year-old man, initially suspected to represent metastatic breast carcinoma.

The patient presented with incidental left axillary lymphadenopathy detected during staging for a small bowel neuroendocrine tumor. Clinical examination revealed a long-standing, painless wart-like axillary skin lesion with recent serous discharge. Imaging demonstrated multiple axillary and intramammary lymph nodes without a definite breast primary. Histopathological analysis of the excised lesion showed mucinous adenocarcinoma with regional nodal metastasis. Immunohistochemistry revealed positivity for ER, PR, GATA3, and mammaglobin, raising strong suspicion for metastatic breast carcinoma. However, absence of a detectable breast lesion and lack of definitive mammary tissue origin created a diagnostic dilemma.

Following multidisciplinary review and correlation of clinical, radiological, and pathological findings, a diagnosis of PCMC of the axilla was established. The patient underwent completion axillary lymph node dissection and was commenced on tamoxifen due to hormone receptor positivity. He remains disease-free after 18 months of follow-up.

This case highlights the diagnostic difficulty of PCMC, particularly in atypical locations such as the axilla, where it closely mimics metastatic breast carcinoma. Accurate diagnosis requires comprehensive clinicopathological correlation. Recognition of this entity is essential to guide appropriate management.

Keywords: Adenocarcinoma, Mucinous, Breast neoplasms, Hormones, Lymph nodes, Lymphadenopathy, Tamoxifen

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Introduction

Primary Cutaneous Mucinous Carcinoma (PCMC) is a rare slow-growing neoplasm of the skin with an indolent behaviour (1). PCMC is slightly more common in men than women and typically affects people at 50 *yrs*. old and above (2). The usual clinical presentation of PCMC is an asymptomatic, solitary erythematous nodule, papule, or cyst of variable sizes typically occurring on the face, scalp, or in the axilla (1). Histologically PCMC is indistinguishable from metastatic mucinous adenocarcinoma from other organs like gastrointestinal tracts, lungs, salivary glands, and particularly from the breasts which makes the diagnosis challenging (3). This case reports a male patient with PCMC mimicking a skin metastasis from occult breast cancer.

Case presentation

A 43-year-old gentleman had small bowel resection for small bowel Neuroendocrine Tumour (NET). He underwent a standard contrast-enhanced CT scan for staging at another hospital that revealed matted and enlarged lymph nodes at the left axilla with two small enhancing nodules in the upper-outer quadrant of the left breast. Subsequently, the whole-body Positron Emission Tomography CT (PET-CT) scan confirmed the presence of high activity within the above-mentioned left axillary matted lymph nodes.

Detailed history and clinical examination revealed that he had a painless left axillary skin lesion. He had it for many years and was not bothered by it. Therefore, he did not seek any medical advice. Recently, he noticed minimal serous discharge over this lesion after the Covid booster vaccination. Clinical examination showed a wart-like skin lesion (2×2 *cm*) at the medial aspect of the left axillary region, with multiple matted enlarged left axillary lymph nodes. The other axilla was unremarkable and there were no abnormalities on bilateral breast examination.

Radiology findings

Bilateral digital breast tomosynthesis were performed to exclude breast malignancy. On top of the multiple left axillary lymphadenopathies observed on previous imaging, there was a left intramammary subcentimeter lymph node at 3 o'clock position, 2 *cm* from left nipple and another subcentimeter lymph node with normal fatty hilum seen at the left axillary tail region. No thickening of the cortex, measuring 2.7 *mm* in thickness. These lymph nodes were consistent with enhancing small nodules seen on previous CT scan.

Subsequently, bilateral breasts MRI done showed two enhancing intramammary lymph nodes (Figure 1) seen at the left outer and axillary tail regions which demonstrated persistent enhancement pattern with surrounding prominent branching channels. There was also multiple, dilated, prominent channels seen at the outer region of the left breast with associated skin thickening. These dilated and prominent channels were hyperintense on DWI images. However, no area of enhancement was observed within. No enhancing breast parenchymal lesion apart from the intramammary lymphadenopathy was mentioned above. Furthermore, no non-mass enhancing area was seen. There was a few enhancing left axillary lymph nodes with loss of fatty hilum in the visualized axilla which return high signal intensity on DWI. The largest lymph node measured 1.6×2.3 *cm* axially. Right breast was normal. MRI impression during that time was left intramammary and left axillary lymphadenopathy with prominent non-enhancing intramammary channels and skin thickening likely due to lymphatic congestions.

Histopathology findings

Subsequently, he underwent a wide local excision of the axillary cutaneous lesion and removal of the matted left axillary lymph nodes. The histopathological examination of the axillary mass was concluded as a mucinous adenocarcinoma of an intermediate grade with regional nodal metastasis. The epicenter of the tumour was within the dermis, and it was expanding upwards and ulcerating the epidermis, and extending downwards to the subcutis (Figure 2). The tumour appears well-defined, circumscribed with lobulated contours and showing expansile growth pattern. They show complex fused tubulo-glandular structures, solid clusters and trabecular arrangements with some are floating in lakes of mucin, with intervening thin fibrovascular septa forming compartments. They moderate to markedly pleomorphic nuclei with prominent nucleoli and possess moderate eosinophilic to amphophilic cytoplasm. Neither micropapillary architecture nor pagetoid spread of the tumour cells

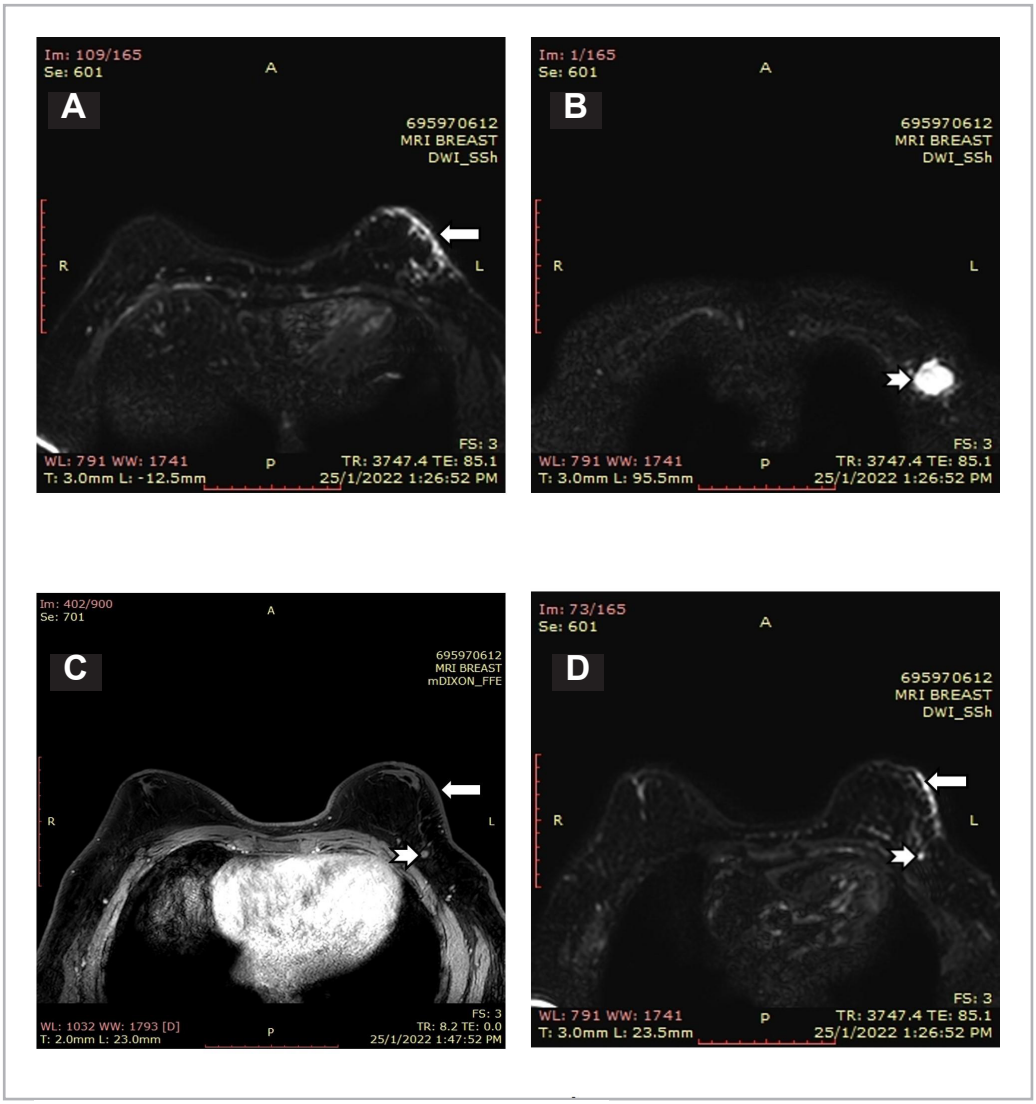

Figure 1. A) and B) DWI images showing prominent left intramammary lymphatic channels (arrow) and left axillary lymphadenopathy (notched right arrow), demonstrating restricted diffusion. C) Post-gadolinium image, and D) a corresponding DWI image, revealing no enhancement of the intramammary lymphatic channels and the skin (arrow), as well as the intramammary lymph node (notched right arrow) which is restricted on DWI.

was seen. No poorly differentiated components are present. The mitotic index is 9/10 HPF. Focal necrosis was detected. Lymphovascular invasion was present, and the tumour is completely excised with the resection margin of 3 *mm* away. Two out of 6 lymph nodes show metastatic disease with extranodal spread. There was no mammary duct or acini seen in the tumour vicinity or in the remote areas. The tumour cells were positive for mammaglobin, GATA3 and EMA with strong Estrogen Receptor (ER) and Progesterone Receptor (PR) expressions (Figure 3). There was focal CK7 positivity with occasional tumour cells were expressing p63. The tumour cells were negative for CK20, TTF1, CDX2, CEA, c-erbB-2 (score 1+), SMA, CK5/6, *Calponin*, GCDPF15, *chromogranin* A and *synaptophysin*. The Ki67 (proliferative index) is approximately 10%.

Based on correlation of PET CT scan and the biopsy finding, nodal and lymphatic metastases from occult breast carcinoma was considered. Therefore, the initial diagnosis of metastatic primary breast carcinoma was favored, despite no breast tissue was identified histologically from the axillary specimen. Given this diagnostic dilemma, the histopathology slides were sent for a second opinion. After further evaluation and multidisciplinary team discussion

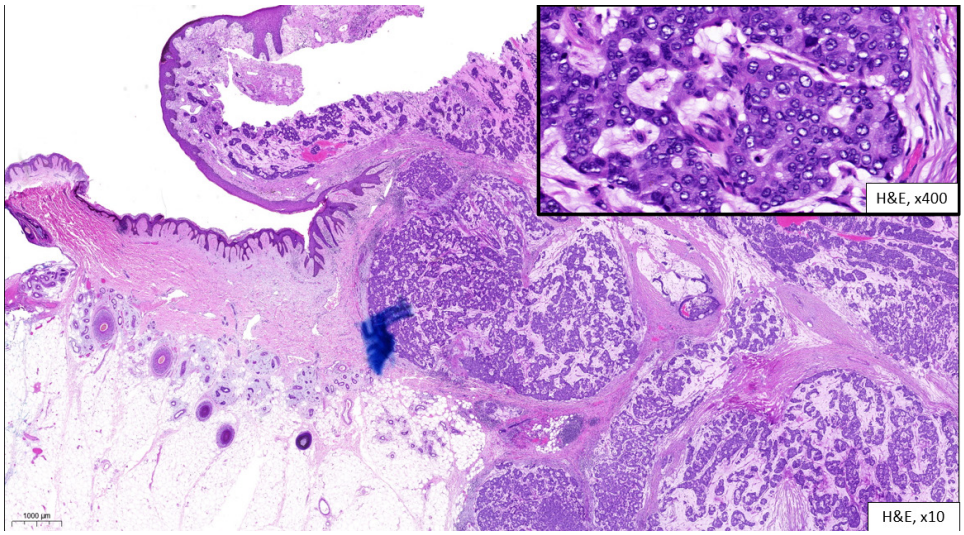

Figure 2. At the low power view, the tumour is seen at dermis, exhibits lobulated contour with expansile growth pattern. Adjacent normal skin with its adnexal structures is noted on the left (H&E, x10). The insert on the upper right shows moderate nuclear pleomorphism of the malignant cells (H&E, x400).

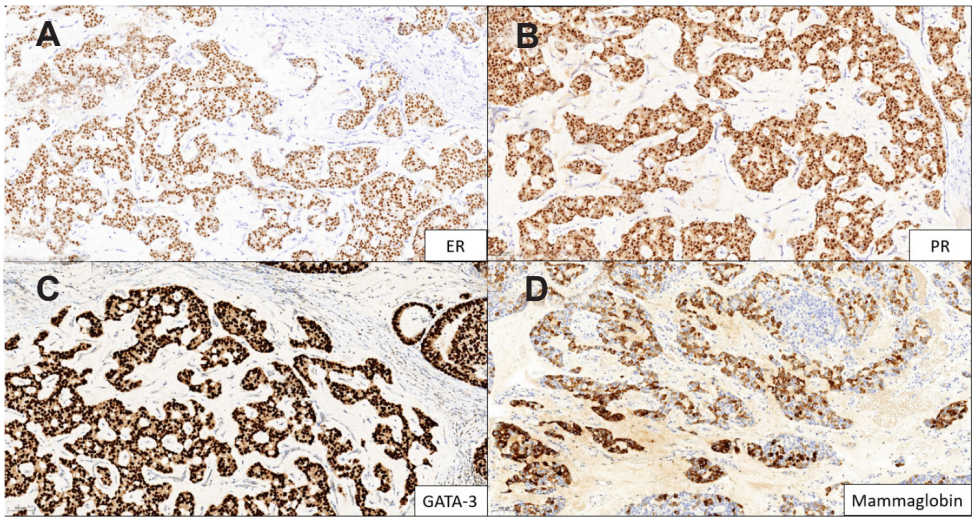

Figure 3. (A-D). Immunohistochemical (IHC) shows the tumour cells are positive for ER, PR, GATA-3, and Mammaglobin. (Magnification: x100).

with the surgeons, oncologists, dermatologists, radiologists, and pathologists' team, the tumour was best regarded as PCMC of the left axilla. He then underwent completion of left axillary lymph node dissections (until level 2) and the histopathology results revealed no nodal metastasis in the remaining re-excised tissue. Subsequently, the oncology team started him on Tamoxifen. He is currently on regular follow-ups for more than 18 months now. Clinical and surveillance axillary ultrasound showed no evidence of local recurrence or distant metastasis.

Discussion

PCMC is a rare adnexal neoplasm that was first described in 1952 by Lenox *et al* (4). It usually shows an indolent clinical course and is often misdiagnosed

clinically as an epidermal cyst, sebaceous carcinoma, cystic basal cell carcinoma, squamous cell carcinoma, neuroma, or pilomatrixoma (1). The most common location for PCMC is the head and neck region, especially around the eyelids. PCMC of the axilla is a very rare tumour and only a few cases reported on this site (5).

Clinically, it usually presents as a solitary, asymptomatic, erythematous skin nodule or papule on the face, scalp, or in the axilla (1). This tumor also typically presents as a slow-growing, painless, soft, sometimes indurated, reddish or gray-blue, non-ulcerating nodules that have been present for several years up to 20 years before diagnosis (5). The patient had a similar presentation; he had a painless wart-like skin lesion over his left axilla for many years until it was incidentally detected during the management of unrelated gastrointestinal pathology. PCMC in the form of an ulcer or cyst was also described (5,6).

Morphologically, it is impossible to differentiate PCMC from metastatic mucinous adenocarcinomas of non-cutaneous organs such as gastrointestinal tract and breast (3). The histopathological features are indistinguishable from the corresponding lesions in the breast (7). It is characterized as being composed of large pools of basophilic mucin divided by thin fibrous septa, creating a honeycomb pattern. Within the lakes of mucin are small "floating" islands of neoplastic epithelial cells, which may be cribriform. At the periphery of the tumor is a denser epithelial component. The neoplastic cells are described as cuboidal, round, or oval, with abundant cytoplasm, small regular nuclei, and rare mitotic figures (1).

The presence of dirty necrosis and goblet cells might suggest intestinal origin (7).

Challenges arise when the site of the tumour is within the chest and axillary region as these locations are strongly related to mammary origin (7). Thus, the differential diagnosis would be PCMC versus metastatic breast carcinoma. Unfortunately, morphology and IHC are identical. In the present case, the primary lesion was in the left axilla with a suspicion of nodal metastasis, clinically. The patient is male and had the mass for many years. It is a known fact that invasive breast carcinoma among male is rare and having on the axillary rest is even rarer. Moreover, most mammary mucinous carcinoma are indolent and very rarely present as a metastatic disease of an occult primary.

To date, no IHC panel has been identified to differentiate primary from metastatic mucinous carcinoma consistently. Yet, a variety of stains have been reported to be helpful in this differential differentiation (3). For example, metastatic mucinous gastrointestinal carcinoma from the colon can be excluded as cytokeratin 20 (CK 20) is negative in PCMC (1). However, IHC is not particularly useful in distinguishing PCMC from mucinous adenocarcinoma of the breast like in the patient as both tumors can express CK7, GATA 3, mammaglobin, ER, and PR (3). It has recently been suggested in the literature that detection of a myoepithelial component in the tumor (confirmed by positivity for p63, CK 5/6, or *calponin* in isolated peripheral cells) suggests PCMC but unfortunately this is not a common finding (3). Qureshi *et al* (8) stated that finding an *in-situ* component of a tumor that stains for myoepithelial cells (positive stains for p63 and CK5/6 among others) can help to exclude metastatic mucinous breast carcinoma (8). In the present patient, the presence of mentioned myoepithelial cells with positive immune stain was detected for p63 but only occasional tumour cells, which can also occur in breast carcinoma that expressed it and the CK5/6 staining was negative. Thus, the IHC staining cannot specifically diagnose PCMC. Hence, the diagnosis was more challenging to confirm whether this lesion is a skin metastasis from occult breast cancer or PCMC (1). Table 1 presents a comparative analysis of primary cutaneous mucinous carcinoma and metastatic breast cancer, highlighting their clinical, radiological, and pathological characteristics.

Generally, PCMC has a favorable good prognosis. It is a slow-growing tumor and have an indolent behavior (3) and often appears well localized. PCMC has direct invasion beyond the reticular dermis and subcutaneous fat or by lymphatic invasion (1). The rate of local metastasis to the regional lymph nodes has been reported as 10% (9). In the current study patient, he had enlarged matted left axillary nodes which confirmed nodal metastasis.

PCMC is a rare disease. Hence, there is no established standard of management for it. Wide Local Excision (WLE) with or without regional lymph node dissection

Table 1. Comparison between primary cutaneous mucinous carcinoma and metastatic breast cancer based on clinical, radiological and pathological characteristics

	Primary cutaneous mucinous carcinoma	Metastatic breast cancer
Clinical presentation		
Incidence	Male is more common than female	Female is more commonly affected than male
Lesions characteristic	Typically, present as painless solitary erythematous nodule, papule, cyst or ulcer in variable sizes and usually solitary	Usually present as metastatic skin lesions in the form of skin nodules, erythematous skin or skin ulcer in which typically, the lesions are multiple, diffuse and very rare to be solitary
Site of lesion	Site of lesion mainly at head and neck area such as over the face or scalp and axilla	Metastatic area is closely related to mammary glands such as chest wall and axilla
Imaging findings		
General	PCMC is generally less prone to metastasis than breast cancer PCMC can metastasize, especially to regional lymph nodes	Pure mucinous breast carcinoma has a lower rate of lymph node metastasis compared to mixed mucinous or invasive ductal carcinoma
Imaging features (can show similar radiological features)	PCMC metastases may exhibit a more variable appearance, with some showing cystic changes or calcifications	Lymph nodes metastasis from breast carcinoma are usually solid in appearance, thickened cortex with loss of normal fatty hilum May be associated with lymphedema and skin thickening of the breast
Pathological findings		
Presence of myoepithelial cells	Can be detected *i.e.*, positive p63, CK5/6, *calponin* (supports cutaneous origin)	Typically absent in metastases
Histologic in-situ component	May be present indicating primary origin	Usually absent in metastasis
IHC		
CK ^{7}	Positive (focal)	Positive
CK^{20}	Negative	Usually negative (breast), positive in GI origin
ER/PR	Positive	Positive (in luminal subtype)
GATA^{3}	Positive	Positive
Mammaglobin	Positive	Positive
p^{63}	May show focal positivity (suggestive of myoepithelial component)	Negative
HER^{2} (cerbB^{2})	Negative or weak (*e.g.*, score1+)	Can be positive in breast carcinoma (scores are variable)

is the treatment of choice. As local recurrences are common, excision with 1-*cm* margin is recommended (4). Mohs Micrographic Surgery (MMS) also is an effective surgical treatment for PCMC at head and neck region, recurrent disease and in cases where tissue conservation is necessary (1).

Although PCMC has low metastatic potential (3–11%), the local recurrence rate after surgery is high (29–34%). The low frequency of distant metastases is believed to be due to the avascularity of this tumor (1). Late recurrence and metastases have been reported probably related to incomplete excision of the tumor (9-10). Such recurrences and metastatic disease have not responded well to treatment with radiotherapy or chemotherapy since they are highly resistant (9-10).

There is limited data in the literature regarding the benefit of adjuvant endocrine therapy in PCMC. Tamoxifen has been successfully used in a few cases of metastasizing eccrine adenocarcinoma (11-13) and several case reports (13,14) have demonstrated the benefits of the endocrine therapy with an aromatase inhibitor for hormone receptor positive advanced PCMC. Considering the fact that PCMC frequently expresses ER and PR, it might respond to endocrine therapies. The current study patient was started on Tamoxifen as his ER and PR status were positive after the multidisciplinary team discussion. He responded well to the adjuvant endocrine therapy and showed no disease recurrent for the past 18 months of follow-up period.

Conclusion

PCMC is a rare tumour with challenging clinical presentation and histological diagnostic dilemma. Therefore, a multidisciplinary team approach with strong clinical, radiological and pathological correlation is warranted to differentiate PCMC from a case of metastatic breast carcinoma, as the morphological and IHC findings may overlap.

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Conflict of Interest

There was no conflict of interest in this manuscript.

References

1. Adefusika J, Pimentel J, Chavan R, Brewer J. Primary mucinous carcinoma of the skin: the Mayo Clinic experience over the past 2 decades. Dermatol Surg 2015;41(2):201-208.

2. Mardi K, Diwana VK. Primary cutaneous mucinous carcinoma : A rare entity. Indian Dermatol Online J 2011;2(2):82-84.

3. Levy G, Finkelstein A, McNiff JM. Immunohistochemical techniques to compare primary vs metastatic mucinous carcinoma of the skin. J Cutan Pathol 2010;37(4):411-415.

4. Lennox B, Pearse AG, Richards HG. Mucin-secreting tumours of the skin with special reference to the so-called mixed-salivary tumour of the skin and its relation to hidradenoma. J Pathol Bacteriol 1952;64(4):865–80.

5. Bari V, Poshirkar A. Cutaneous primary mucinous adenocarcinoma of axilla - A rare tumour at rare site. Int J Curr Med Appl Sci 2015;9:7-9.

6. Beteddini OS, Sheikh S, Shareefi F, Shahab R. Primary mucinous adenocarcinoma of the scalp: A case report and literature review. Int J Surg Case Rep 2015;10:241-244.

7. Daniela M, Thomas B, Dimitry VK, et al. Chapter 4: Appendageal tumours: Tumours with apocrine and eccrine differentiation. Malignant apocrine and eccrine tumour. Mucinous carcinoma. In: WHO Classification of Tumours Editorial Board. Skin tumours. Lyon (France): International Agency for Research on Cancer;WHO Classification of Tumours series.2023.

8. Qureshi JS, Salama ME, Chitale D, Bansal I, Ma CK, Raju U, et al. Primary cutaneous mucinous carcinoma: Presence of Myoepithelial cells as a clue to the cutaneous origin. Am J Dermatopathol 2004;26(5):353-358.

9. Akinci M, Salan A, Cetin B, Aslan S. Primary mucinous eccrine adenocarcinoma of the skin in a 69-year-old man. Chirurgia (Bucur) 2010;105(1):109-111.

10. Kamalpour L, Brindise R, Nodzenski M, Bach D, Veledar E, Alam M. Primary cutaneous mucinous carcinoma a systematic review and meta-analysis of outcomes after surgery. JAMA Dermatol 2014;150(4):380-384.

11. Schroder U, Dries V, Klussmann JP, Wittekindt C, Eckel HE. Successful adjuvant tamoxifen therapy for oestrogen receptor-positive metastasizing sweat gland adenocarcinoma: need for a clinical trial? Ann Otol Rhinol Laryngol 2004;113(3 Pt 1):242–244.

12. Daniel SJ, Nader R, Kost K, Huttner I. Facial sweat gland carcinoma metastasizing to neck nodes. A diagnostic and therapeutic challenge. Arch Otolaryngol Head Neck Surg 2001;127(12):1495–1498.

13. Shockman S, Krug L, Lountzis N. Remission of metastatic primary mucinous carcinoma of the skin with anastrozole. J Am Acad Dermatol 2014;71(1):e27-e28.

14. Tanemura A, Deguchi A, Tanaka A, Kiyohara E, Kishioka A, Katayama I. A rare case of mucinous carcinoma of the skin with multiple organ metastases. Eur J Dermatol 2015;25:483-484.