CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 77 (2020) 122–125

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Sentinel lymph node biopsy of primary apocrine sweat gland carcinoma of the axilla: A case report and review of the literature

Chikako Sekine[a,b,*], Kazumi Kawase[a], Kazuhiko Yoshida[a]

[a] Department of Surgery, The Jikei University School of Medicine Katsushika Medical Center, 6-41-2 Aoto, Katsushika Ward, Tokyo 125-8506, Japan
[b] Department of Breast Surgery, International University of Health and Welfare, Narita Hospital, 852 Hatakeda Narita, Chiba 286-0124, Japan

ARTICLE INFO

Article history:
Received 21 September 2020
Accepted 17 October 2020
Available online 28 October 2020

Keywords:
Apocrine sweat gland carcinoma
Apocrine carcinoma
Sentinel lymph node biopsy

ABSTRACT

INTRODUCTION: Primary apocrine sweat gland carcinoma (PASGC) is a rare subtype of sweat gland carcinoma, mostly occurring in the apocrine-dense regions such as the axilla, areola, and scalp.
PRESENTATION OF CASE: An 83-year-old woman developed a red elevating mass on her left axilla, without palpable axillary lymph nodes. Excision biopsy revealed that the tumor was PASGC. Additional wide resection and sentinel lymph node biopsy (SLNB) were performed without any adjuvant therapy. One year after the surgical procedure, the patient did not show any evidence of recurrence and axillary surgical complications.
DISCUSSION: As PASGC arising in the axilla can progress aggressively, differential diagnosis is essential. Previous reports have shown the usefulness of SLNB, but the axillary management for patients with clinically node negative PASGC has not been established because of its rarity. Especially in axillary cases, to identify the true sentinel lymph nodes is sometimes considered inaccurate because the lymphatic flow is complicated in the axilla.
CONCLUSION: Although SLNB in sweat gland carcinoma has believed safety and been performed, this is the first axillary PASGC case that was performed SLNB. Careful follow-up is needed.

1. Introduction

Primary apocrine sweat gland carcinoma (PASGC) is a rare adnexal neoplasm that typically originates in the areas of high apocrine gland density, such as the axilla [1]. Most of these tumors are naturally slow growing, and this can result in diagnostic delays. In contrast, PASGC sometimes progresses aggressively, with the ability to metastasize [2]. When it arises at the axilla, differential diagnosis from breast carcinoma metastatic to the skin or apocrine carcinoma arising in ectopic breast tissue is essential [3,4]. Histological analysis and immunohistochemistry findings are helpful for effective diagnosis of the tumor. After the confirmed diagnosis of clinically positive nodes, the treatment for localized PASGC involves local excision with a clear margin along with axillary lymph node dissection (ALND). The role of sentinel lymph node biopsy (SLNB) for PASGC treatment remains controversial [5]. Although the use of SLNB in sweat gland carcinoma has long been known and used [6], to our knowledge, this is the first axillary PASGC case that was performed SLNB. This work is reported by following the surgical case report (SCARE) guidelines [7].

2. Presentation of case

An 83-year-old woman visited the Department of Dermatology in our hospital with a 2-year history of a red lump, with erosion, on her left axilla. The tumor measured approximately 1 cm, was painless, had hardened, and was slow growing. There were no palpable axillary nodes (Fig. 1). She had hypertension but did not have family history of cancers including breast carcinoma. Incisional biopsy revealed that the tumor was adenocarcinoma with apocrine differentiation. The anaplastic tumor cells contained eosinophilic cytoplasm and large round nuclei with clear nucleoli. Alcian blue positive mucus was observed at the internal surface of the lumina, but not in the cytoplasm. The tumor cells stained positive for cytokeratin 7, gross cystic disease fluid protein 15 (GCDFP15), and GATA-binding protein 3 and negatively for the estrogen receptor (ER) (Fig. 2). The patient was then referred to our institution for further treatment.

Mammography and ultrasonography did not show remarkable changes in the patient's breasts. A hypervascular round tumor projecting from the skin was identified by ultrasonography on her left axilla (Fig. 3). Accessory breast tissue was not detected at the bilateral axilla. Positron emission tomography-computed

Abbreviations: ALND, axillary lymph node biopsy; ER, estrogen receptor; GCDFP15, gross cystic disease fluid protein 15; PASGC, primary apocrine sweat gland carcinoma; SLNB, sentinel lymph node biopsy.

* Corresponding author at: 6-41-2 Aoto, Katsushika ward, Tokyo 125-8506, Japan.
E-mail address: chikako.s@jikei.ac.jp (C. Sekine).

https://doi.org/10.1016/j.ijscr.2020.10.067

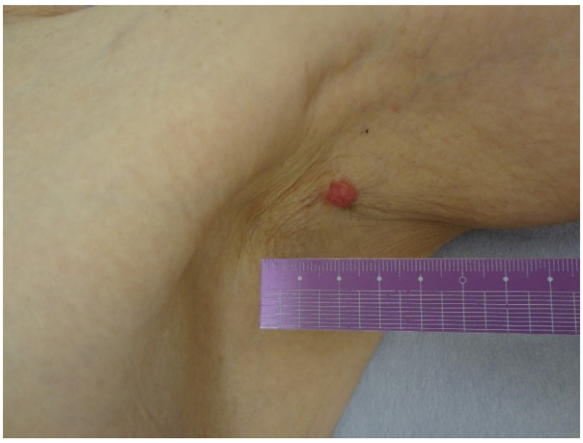

Fig. 1. A red tumor on the left axilla with a size of 1.0 cm.

tomography did not show significant fluorodeoxyglucose uptake. From the above results, the tumor was strongly suspected to be a PASGC. A wide local excision with sufficient margin and SLNB were performed. The SLN was identified using a combination of technetium-99m-labeled sulfur colloid and blue dye injected intracutaneously around the tumor. Forty-eight megabecquerel of technetium-99m-labeled sulfur colloid and 20 mg of indigo carmine were injected 1 day before and just before the operation, respectively. One SLN, which was hot and blue, was collected for intraoperative histological investigation. The tumor consisted of a solid well-circumscribed nodule with free margin. It was mainly located in the dermis and partially infiltrated subcutaneous adipose tissue. There were some normal cutaneous glands around the legion. No ectopic mammary tissue was detected. One SLN was negative for metastasis.

Adjuvant therapy was not performed. Twelve months after the surgical procedure, the patient showed no evidence of local recurrence and distant metastasis without adjuvant therapy. Moreover, axillary surgical complications, loss of local sensitivity, pain, lymph edema, and motor disorder were not developed.

3. Discussion

PASGC is a rare subtype of adnexal cutaneous carcinoma, which generally arises in the areas of high apocrine gland density such as the axillae, vulva, or areola [1]. The median age of patients

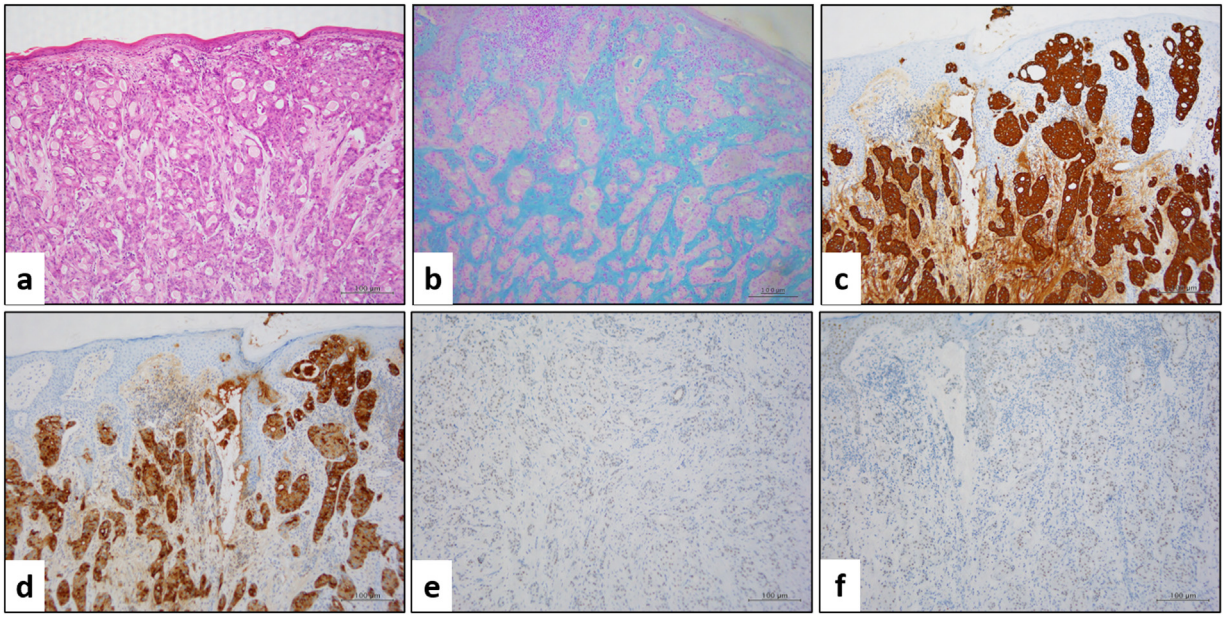

Fig. 2. Histopathology of the axillary tumor. The tumor is located in the dermis and formed by cells with eosinophil granular cytoplasm (a). There is Alcian blue-positive mucus in the lumina (b). The tumor cells showed positive staining for cytokeratin 7 (c), gross cystic disease fluid protein 15 (d), and GATA-binding protein 3 (e) and negative staining for estrogen receptor (f).

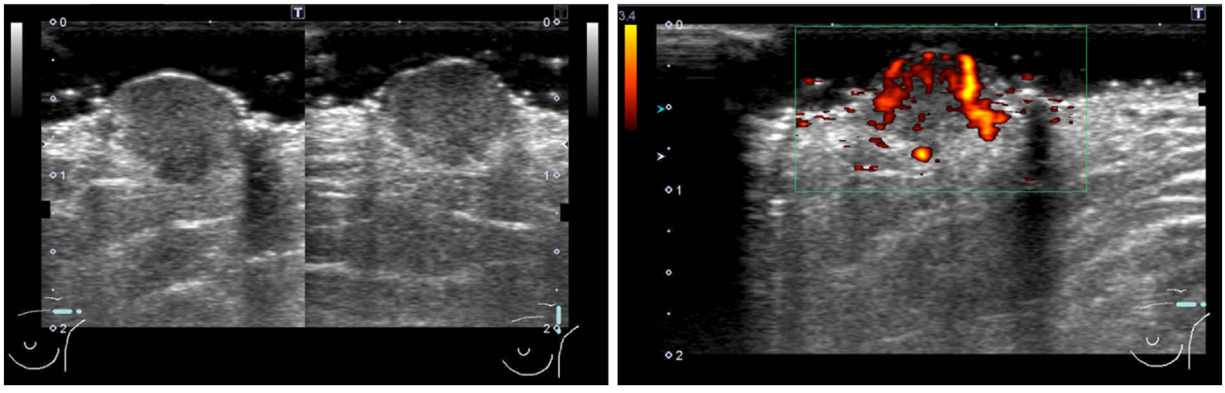

Fig. 3. Axilla ultrasonography showing a homogeneous hypoechoic mass measuring 8.8 × 7.4 × 8.6 mm.

Table 1
Clinical data of 14 reported cases of PASGC of axilla in the literature.

Number	Authors	Sex	Age	History duration	Tumor Size	Surgery	Ln metastasis	Adjuvant therapy	Recurrences	Follow-up
1	Kathrotiya et al. [1] 2015	M	49	1year	5 cm	Wide excision + ALND	+	RT	–	10 months
2	Toledo-Pastrana et al. [2] 2014	M	33	1year	1 cm	Wide excision + ALND	+	RT	–	6 months
3	Seong et al. [3] 2015	M	51	26 months	4 cm	Wide excision + ALND	+	RT	–	9 months
4	Seong et al. [3] 2015	M	66	ND	4 cm	Wide excision + ALND	+	RT	–	10 months
5	Zahid et al. [4] 2016	M	56	27 months	5 cm	Wide excision + ALND	–	–	–	9 months
6	Gatti et al. [10] 2017	M	72	6 months	6.4 cm	Wide excision + ALND	+	RT, CT	–	ND
7	Miyamoto et al. [14] 2005	M	89	6 months	5 cm	Wide excision + ALND	–	–	+	23 months
8	Katagiri et al. [15] 1999	M	64	10 years	1 cm	Wide excision + ALND	–	–	–	24 months
9	Katagiri et al. [15] 1999	M	54	4 months	2 cm	Wide excision + ALND	–	–	–	ND
10	Kuno et al. [16] 1999	M	74	5 months	4.5 cm	Wide excision + ALND	+	RT, CT	+	17 months
11	Zehr et al. [17] 1997	M	49	ND	15 cm	Wide excision + ALND	+	–	–	12 months
12	Cameselle-Teijeiro et al. [18] 1997	M	42	1 year	ND	Wide excision + ALND	+	ND	–	5 yesrs
13	Elliott et al. [19] 1956	M	64	4 years	1.5 cm	Wide excision + ALND	+	RT	–	24 months
14	Nishikawa et al. [20] 1994	M	69	ND	ND	Wide excision + ALND	–	–	–	20 months
15	Present study	F	83	2 years	1 cm	Wide excision + SLNB	–	–	–	1 year

LN = lymph nodes; ALND = axillary lymph node dissection; SLNB = sentinel lymph node biopsy; RT = radiation therapy; CT = chemotherapy; ND = not described.

with PASGC varies among studies but is usually in the 6th decade of life [1,5]. These tumors mostly present as slowly enlarging, painless, indurated nodules without bleeding and ulceration [3]. These benign-like processes often delay the diagnosis [2]. In cases wherein PASGC arises at the axilla, it should be distinguished from metastasis of breast carcinoma, accessory breast carcinoma, or other skin carcinomas. For differential diagnosis, imaging analysis and histopathological and immunohistochemical methods are required to detect tumors in the breasts or other organs. The neoplasm is usually an asymmetrical, encapsulated lesion with jagged or pushing borders, involving the dermis and subcutaneous tissue. Papillary, tubular, and solid are the most common growth patterns, which usually indicate an invasive component. The histologic picture is similar to that of adenocarcinoma. The neoplastic cells have abundant eosinophilic cytoplasm, which may be granular and sometimes partly vacuolated. Immunohistochemically, the tumor cells express cytokeratins, which are highly positive for GCDFP15 and variably positive for carcinoembryonic antigen, S100 protein, epithelial membrane antigen, ER, and progesterone receptor [8].

The standard treatment for PASGC is local excision with a clear margin of 1–2 cm along with ALND if clinically positive nodes are detected. It is considered that the most important predictor of survival may be lymph node metastasis (40–60%) [2,3,9,10]. Therefore, accurate diagnosis of lymph node metastasis is necessary. The benefit of ALND for clinically node negative PASGC patients is unclear [1,10]. Previous studies have shown that SLNB was useful for those patients [6,7,11]. In addition, SLNB can reduce the risk of ALND complications, such as nerve injury, shoulder pain, lymphedema, and motor dysfunction [9]. Although it is believed that SLNB for PASGC can be an effective surgical approach and performed safety, it has not been established due to its low incidence rates [6]. In axillary cases, to identify SLNs could be difficult because the lymphatic flow of the axillary skin is complicated, unlike the arm and areola. In the axillary area, there are both flows from the arm and the breast [12]. The lymphatic flow of axillary skin is not unidirectional. It is often unclear whether identified lymph nodes are the true SLNs. In present case, SLNB was performed easily, but longer observation is needed to assess its usefulness. As conducting a large randomized trial is challenging, case accumulation, such as the present experience, might be helpful for gathering evidence.

The clinical details of axillary PASGC cases with available published literature were listed in Table 1. All cases were performed ALND. Lymph node metastases were detected in 9 of 14 cases. SLNB may be a suitable procedure in the early stage like present case. However, there were cases that had lymph node metastases with small primary tumors. Therefore, careful follow-up is needed.

The advantages of postoperative treatment remain undetermined [2,3,5], and the benefit of adjuvant chemotherapy is limited [9,13–15]. In contrast, it has been reported that adjuvant radiotherapy reduces the risk of relapse [13]. Hence, it should be considered for advanced tumors with large tumor size, positive margins, poor differentiation, and vascular or lymphatic invasion [13]. As the patient in this case did not show advanced tumor characteristics with complete resection, adjuvant therapy was not administered. Although the information on PASGC prognosis is inadequate, well differentiated, and small size tumors without lymph node metastasis are considered good prognostic indicators [3.5]. However, once the disease progresses, it shows resistance to chemotherapy and radiotherapy [2,3]. Therefore, accurate diagnosis and sufficient local therapy are important at the early stage.

4. Conclusion

PASGC is a rare malignant tumor that arises at the axilla. Clinically and pathologically differential diagnoses are important. The treatment strategy is not well established because of the tumor's

rarity. Although SLNB for axillary PASGC is always concerned about whether it can evaluate true SLNs, according to previous reports of non-melanoma, SLNB is regarded as a reasonable surgical approach in early cases. Further case validation and extended follow up are required.

Declaration of competing interest

We declare no conflict of interest.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval

For this study, ethical and ethnical approval are not required.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Chikako Sekine: Conceptualization, Data curation, Investigation, Writing - original draft.
Kazumi Kawase: Investigation, Writing - Review & Editing.
Kazuhiko Yoshida: Investigation

Registration of research studies

1. Name of the registry: researchmap
2. Unique identifying number or registration ID: 20893639
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): https://researchmap.jp/c-s

Guarantor

Chikako Sekine.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Acknowledgements

The authors thank Dr Koichi Nomura the Department of Clinical Pathology, The Jikei university school of medicine Katsushika medical center, for his pathological support in this study process.

References

[1] P.R. Kathrotiya, A.T. Bridge, S. Warren, H. Do, A.S. Klenk, L.Y. Xu, A.N. Mathur, Primary apocrine adenocarcinoma of the axilla, Cutis 95 (2015) 271–274, 281.
[2] T. Toledo-Pastrana, B. Llombart-Cussac, V. Traves-Zapata, C. Requena-Caballero, O. Sanmartin-Jimenez, M. Angels-Sales, et al., Case report: differential diagnosis between primary cutaneous apocrine adenocarcinoma versus extramammary or metastatic breast adenocarcinoma, Am. J. Dermatopathol. 36 (2014) e175–178, http://dx.doi.org/10.1097/DAD.0b013e318288cdd2.
[3] M.K. Seong, E.K. Kim, K. Han, H. Seol, H.A. Kim, W.C. Noh, Primary apocrine sweat gland carcinomas of the axilla: a report of two cases and a review of the literature, World J. Surg. Oncol. 13 (2015) 59, http://dx.doi.org/10.1186/s12957-015-0473-1.
[4] E. Zahid, M.E. Soofi, H. Elmalik, K. Junejo, Primary apocrine carcinoma of the axilla in a male patient: a case report, Clin. Case Rep. 4 (2016) 344–347, http://dx.doi.org/10.1002/ccr3.515.
[5] D. Ogata, Y. Kiyohara, S. Yoshikawa, M. Kasumi, Treatment strategy for cutaneous apocrine carcinoma, Int. J. Clin. Oncol. 19 (2014) 712–715, http://dx.doi.org/10.1007/s10147-013-0594-x.
[6] R.S. Chamberlain, K. Huber, J.C. White, R. Travaglino-Parda, Apocrine gland carcinoma of the axilla: review of the literature and recommendations for treatment, Am. J. Clin. Oncol. 22 (1999) 131–135, http://dx.doi.org/10.1097/00000421-199904000-00005.
[7] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A. Fowler, D.P. Orgill, For the SCARE Group, The SCARE 2018 statement: updating consensus surgical case report (SCARE) guidelines, Int. J. Surg. 60 (2018) 132–136.
[8] D.E. Elder, D. Massi, R.A. Scolyer, R. Willemze, WHO Classification of Skin Tumours, 4th ed., 2018, pp. 174–175.
[9] B. Pucevich, S. Catinchi-Jaime, J. Ho, D. Jukic, Invasive primary ductal apocrine adenocarcinoma of axilla: a case report with immunohistochemical profiling and a review of literature, Dermatol. Online J. 14 (2008) 5.
[10] A.P. Gatti, L. Tonello, W. Pfaffenzeller, F.O. Savoia, D.I. Goergen, R. De Pieri Coan, et al., Apocrine sweat gland adenocarcinoma: a rare case report and review, Int. J. Surg. Case Rep. 36 (2017) 78–81, http://dx.doi.org/10.1016/j.ijscr.2017.04.029.
[11] M.L. Matthey-Gie, A. Boubaker, I. Letovanec, N. Demartines, M. Matter, Sentinel lymph node biopsy in nonmelanoma skin cancer patients, J. Skin Cancer (2013), 267474, http://dx.doi.org/10.1155/2013/267474.
[12] E. Tummel, D. Ocoa, S. Korourian, R. Betzold, L. Adkins, M. McCarthy, et al., Does axillary reverse mapping prevent lymphedema after lymphadenectomy? Ann. Surg. 265 (2017) 987–992.
[13] A. Morabito, P. Bevilacqua, S. Vitale, M. Fanelli, D. Gattuso, G. Gasparini, Clinical management of a case of recurrent apocrine gland carcinoma of the scalp: efficacy of a chemotherapy schedule with methotrexate and bleomycin, Tumori 86 (2000) 472–474, http://dx.doi.org/10.1177/030089160008600608.
[14] T. Miyamoto, Y. Hagari, S. Inoue, T. Watanabe, T. Yoshino, Axillary apocrine carcinoma with benign apocrine tumors: a case report involving a pathological and immunohistochemical study and review of the literature, J. Clin. Pathol. 58 (2005) 757–761.
[15] Y. Katagiri, S. Ansai, Two cases of cutaneous apocrine ductal carcinoma of the axilla. Case report and review of the literature, Dermatology 199 (1999) 332–337.
[16] Y. Kuno, T. Numata, T. Kanzaki, Adenocarcinoma with signet ring cells of the axilla showing apocrine features: a case report, Am. J. Dermatopathol. 21 (1999) 37–41.
[17] K.J. Zehr, M. Rubin, L. Ratner, Apocrine adenocarcinoma presenting as a large ulcerated axillary mass, Dermatol. Surg. 23 (1997) 585–587.
[18] J. Cameselle-Teijeiro, N. Alfonsin-Barreiro, F. Allegue, M. Caeiro, Apocrine carcinoma with signet ring cells and histiocytoid features: a potentially confusing axillary tumor, Pathol. Res. Pract. 193 (1997) 717–720.
[19] G.B. Elliott, D.W. Ramsey, Sweat gland carcinoma, Ann. Surg. 144 (1956) 99–106.
[20] Y. Nishikawa, Y. Tokusashi, Y. Saito, K. Ogawa, N. Miyokawa, M. Katagiri, A case of apocrine adenocarcinoma associated with hamartomatous apocrine gland hyperplasia of both axillae, Am. J. Surg. Pathol. 18 (1994) 832–836.