

A Rare Occurrence of Right Axillary Tubular Apocrine Adenoma: A Case Report from South-South Nigeria

Nuvie OYEYEMI^{1*}, Tare DINYAIN²

¹Department of Obstetrics and Gynaecology, Federal Medical Centre, Yenagoa, College of Medical Sciences, Federal University Otuoke, Bayelsa State, Nigeria.

²Department of Anatomic Pathology and Forensic Medicine, Federal Medical Centre, Yenagoa Bayelsa State, Nigeria

ABSTRACT

Introduction: Tubular apocrine adenoma (TAA) is an extremely rare benign tumour of the skin adnexa/appendage – the sweat gland. Just less than 150 cases have been reported worldwide in the medical literature since the condition was first described. Most of this type of tumours are found on the scalp. This case highlights the occurrence of this tumour in the axilla, which may often be mistaken for axillary lymphadenopathy secondary to breast lesions/conditions.

Case presentation: A 36-year-old multiparous woman who presented in the gynaecology clinic with a 2-year history of a painless right armpit seed-like swelling, she had no axillary breast tissue. Mammography and high resolution breast sonogram done had essentially normal breast findings. A diagnosis of right axillary subcutaneous granuloma, to rule out secondary tumour from an occult breast lesion/tumour was made, and she was counselled for excision biopsy. Preoperative assessment was done with physical examination and investigations. Following excision biopsy, histopathological assessment revealed overall features of tubular apocrine adenoma. Her post-operative course and subsequent follow-up has been uneventful.

Conclusion: axillary tubular apocrine adenoma is a distant rarity, however, a high index of suspicion may be required when a woman presents with a subcutaneous axillary lump. The excision biopsy of the axillary lump should be subjected to histopathologic assessment with or without immunohistochemistry, to be able to clinch the diagnosis of tubular apocrine adenoma.

KEYWORDS: Axillary tubular apocrine adenoma, rare, benign, case report

INTRODUCTION

TAA is a rare benign tumour of the skin adnexa first described in 1972 by Landry and Winkelmann. [1] It occurs more commonly in the scalp as was first described, but can be seen, though more rarely in the skin of other parts of the body, like the axilla. Axillary TAA is an extremely rare benign tumour of the apocrine glands of the axilla. It characteristically occurs as a slow-growing, painless, well-defined lump/nodule under the skin of the axilla, usually the dermis.[2] Because of its closeness to the subcutaneous tissue it can be mistaken for a subcutaneous tissue swelling as occurred in the index patient. The tumour has a general female preponderance and has an approximately 2:1 female:male preponderance. It can present over a wide adult age range, from 18 to 78 years.[2,3] It may often appear like a site for malignant metastasis of breast cancer, or axillary lymphadenopathy. This was what prompted the request for mammogram and high resolution breast sonography in the index patient. So far, less than one hundred and fifty cases have been recorded all over the world.[2,3] Global and regional data are very sparse, and in Africa there is an extreme paucity of documentation of this type of tumour. Though this may be as a result of failure to report such cases or under-reporting, and limited access to required investigations both pre-excision tests and post-excision histopathology/immunohistochemistry. In Nigeria the occurrence of axillary TAA may be exceedingly rare and may not have been reported prior to this index case. Patients who present with this kind of axillary swelling in Nigeria are more likely to be diagnosed as having reactive lymphadenopathy (from localized skin infections/furuncles, breast infections or systemic infections like tuberculosis). Other likely differential diagnoses include accessory/axillary breast lump/fibroadenoma, hidradenitis suppurativa, lipomas/epidermoid cysts in the axilla, and metastatic breast cancer to axillary lymph nodes.

There is no identifiable cause to this type of tumour, and no well-defined risk factors as with cancers, like smoking or carcinogenic exposure.[2,3] However a few underlying factors have been identified for this condition, as highlighted from its statistical trends and occurrence of clinical cases. These include the female biological sex, with a male:female ratio of approximately 1:2; pre-existing/co-existing skin conditions; genetic mutations; and anatomical density of apocrine sweat glands in the axilla.[2,3]

A Rare Occurrence of Right Axillary Tubular Apocrine Adenoma: A Case Report from South-South Nigeria

Patients usually presents with an insidious slow-growing painless lump in the axilla. The lump may vary in size, between 0.5 to up to 3cm in widest diameter.[2] The index patient had a similar lump of about 1.5cm in widest diameter. Due to the extreme rarity of the condition, it eluded suspicion preoperatively. Investigations were done to rule out a mammary primary focus, hence the mammography and high resolution breast ultrasonography.

The excision biopsy confirms the cells are benign and originate from the skin adnexa. Usually histopathological examination with or without immunohistochemistry is key to diagnosis. Immunohistochemistry is only required if there is a diagnostic difficulty. Management options include expectant management and follow-up after successful surgical excision. Recurrence or malignant manifestation has not been reported in isolated TAA after complete excision.[2]

CASE PRESENTATION

Patient history

Mrs. ECD, a 36-year-old Para 3⁺⁰ (3A) who presented in the gynaecology clinic with a 2-year history of a painless slow-growing right armpit seed-like swelling, she had no axillary breast tissue. No breast lump, axillary lymphadenopathy, or other swellings in any other parts of her body. There was no history of any nipple discharge, and had a history of regular breast self-examination. She had had three previous caesarean deliveries, she breastfed all her babies for one year and her last confinement was about three years previously. No history of any other surgeries, minor or major. A history of Papanicolaou smear done was normal. There was no family or personal history of any gynaecological cancers. She did not take tobacco products or alcoholic beverages.

Clinical examination

General examination revealed an obese woman with a body mass index (BMI) of 41kg/m² (height of 1.71m and weight of 120kg), and other findings were essentially normal. Breast examination revealed grossly normal breasts bilaterally and a right axillary lump that appeared to be in the subcutaneous tissue, attached to skin but not underlying structures. Lump was firm in consistency, about 1x1cm clinically, non-tender, no differential warmth, mobile with the skin. The left axilla was grossly normal. Other physical examination findings were essentially normal. A clinical diagnosis of right axillary subcutaneous granuloma, to rule out secondary axillary swelling from a possible occult breast lesion, was made.

Management

Mrs. ECD was counselled for excision biopsy and informed consent was obtained, after her mammogram and high resolution breast sonography reports were reviewed. The mammogram report was normal, while the high resolution breast sonography showed right axillary subcutaneous lump ?epidermoid cyst, and left axilla and both breasts were otherwise normal. She had pre-operative investigations: haemoglobin concentration 12.2g/dl, otherwise normal full blood count, electrolyte urea and creatinine assay, urinalysis and blood glucose (FBS – 5.5mmol/L, RBS – 6.1mmol/L); Viral markers, with tests for tuberculosis and syphilis were all negative. Excision biopsy of axillary lump was done after skin preparation, and under local infiltration with lignocaine, and the specimen was sent for histopathologic examination. Wound was dressed aseptically with a firm dressing. She was observed for about 3 hours before discharge home, to return in 5 days for removal of dressing and wound inspection.

She had a dose of peri-operative intravenous antibiotics and analgesics and continued orally for three days after the procedure. She was given a 5-day gynaecology clinic appointment. At the gynaecology clinic visit, she had no complaints, wound was inspected and was healing well, she was counselled on wound care with twice daily cleaning with methylated spirit for atleast two weeks. She presented in clinic again after about 2 weeks, with her histopathological report. Her post-operative course and follow-up was uneventful. Immunohistochemistry was not done abinitio due to constraints in routine availability of this investigation, and was eventually not required because there was no difficulty in the histopathologic assessment.

Histopathological findings

GROSS (NAKED-EYE) DESCRIPTION

Specimen consists of a tan to yellowish soft to firm tissue measuring 1.5 x 1 x 0.5cm, the cut surface is greyish white to variegated.

MICROSCOPIC DESCRIPTION

Sections show skin with an intact epidermis overlying a well-circumscribed, unencapsulated but sharply demarcated dermal tumour. The tumour is located in the reticular dermis and does not show connection to the overlying epidermis.

Histologic sections of axillary tissue show a benign mesenchymal lesion composed of proliferation of small round tubules lined by single layer of cuboidal to columnar epithelial cells with intact basement membrane. Some of these lobules are cystically dilated containing secretions exhibiting apocrine metaplasia. Other areas appear papillary with same ductal structures. Also seen are foci of adipocytes, haemorrhages and normal skin adnexal structures - **Figure 1**

DIAGNOSIS:

SPECIMEN ID: **RIGHT AXILLARY SUBCUTANEOUS LUMP**

PATHOLOGIST'S DIAGNOSIS: **TUBULAR APOCRINE ADENOMA.**

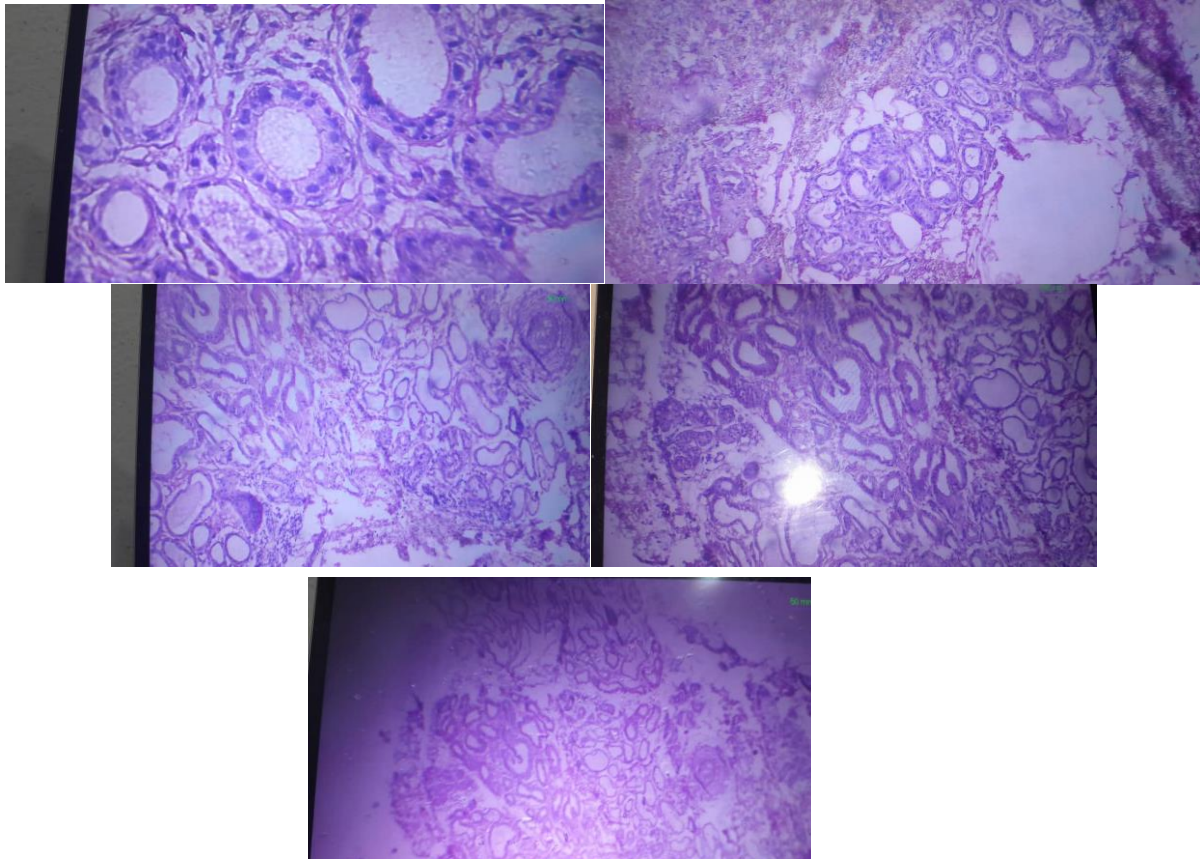
A Rare Occurrence of Right Axillary Tubular Apocrine Adenoma: A Case Report from South-South Nigeria

COMMENT:

Histologic features are those of a benign tubular apocrine adenoma. This is a rare, benign adnexal neoplasm showing tubular architecture and decapitation secretion consistent with apocrine differentiation. Complete excision is curative. No evidence of malignancy is seen.

She was placed on routine clinic follow-up, first in one month, then after three months, and subsequently 6-monthly. She has remained without any complaints.

Figure 1



PHOTOMICROGRAPHS: The tumour is composed of numerous small, irregularly-shaped, rounded to elongated tubules lined by a double layer of epithelial cells. The inner luminal layer is composed of cuboidal to columnar cells with abundant eosinophilic cytoplasm showing prominent apical snouting and decapitation secretion. The outer layer consists of flattened to cuboidal myoepithelial cells. Tubular lumina contain eosinophilic secretory material. The intervening stroma is hypocellular, sclerotic and fibro-collagenous with mild chronic inflammatory infiltrate. No significant cytologic atypia, mitotic activity, necrosis, infiltrative borders, or perineural invasion is seen.

OVERALL FEATURES ARE ESSENTIALLY OF TUBULAR APOCRINE ADENOMA.

DISCUSSION AND CONCLUSION

Tubular apocrine adenoma is an extremely rare benign skin adnexal neoplasm arising from sweat gland structures and characterized by prominent tubular differentiation with apocrine features. Although it is a benign lesion, its rarity and considerable histopathological overlap with other adnexal tumours can make diagnosis challenging. The tumour was initially described in the scalp and has subsequently been reported in several other anatomical locations, including the face, axilla, genital region, palm and eyelid. The axilla is an anatomically plausible site because of its abundance of apocrine glands; nevertheless, isolated axillary TAA remains a distinct rarity. [1–4] The index case of a right axillary TAA therefore represents an unexpected and unusual presentation of an already rare cutaneous adnexal neoplasm. The patient however had relevant investigations to rule out the common differential diagnosis of her presentation, though there was the limitation of not being able to do immunohistochemistry alongside the histopathological examination conducted on the excision biopsy specimen. This limitation was however circumvented due to the ease of diagnosis of TAA with the histopathologic studies conducted.

The biological origin of TAA has historically generated various reports. Apocrine glands are concentrated in areas such as the axilla and anogenital region and are associated developmentally with hair follicles. This distribution helps explain why the scalp remains the most frequently described site for TAA, while the axilla represents a less frequently encountered location. [3,4] Some authors have suggested that TAA, papillary eccrine adenoma and related tubulopapillary lesions may exist along a morphological spectrum rather than representing entirely separate entities. Molecular findings, including the identification of BRAF V600E mutations in a substantial proportion of tubular apocrine adenomas and papillary eccrine adenomas, have provided additional evidence supporting a biological relationship between these tumours. [5] Consequently, the nomenclature and precise classification of these lesions have remained subjects of pathological debate.

Clinically, TAA generally presents as a solitary, insidious, well-circumscribed nodule. Symptoms are variable, with many patients presenting because of an asymptomatic swelling under the skin, although mild pain or intermittent discomfort may occur. The clinical appearance is not sufficiently distinctive to permit reliable diagnosis before histological examination. An axillary lesion may particularly be mistaken for a benign epithelial skin lesion, lymph node enlargement or metastasis from breast cancer, epidermal inclusion cyst, lipoma or other soft-tissue tumour. The high resolution breast sonogram done by the index patient showed a right axillary subcutaneous lump suggesting epidermoid cyst. In the very few previously reported axillary TAA, clinical differential diagnoses have included squamous papilloma and other nonspecific benign cutaneous lesions. [2,6] Thus, the definitive diagnosis of an axillary TAA depends solely on the histopathological assessment.

The characteristic microscopic appearance is that of a well-circumscribed unencapsulated but sharply demarcated dermal tumour, or dermal-subcutaneous proliferation of variably sized tubules. The tumour is typically located in the reticular dermis and does not usually show connection to the overlying epidermis. The structures typically demonstrate a dual epithelial arrangement, consisting of an inner layer of columnar or cuboidal secretory cells and an outer layer of smaller cuboidal or myoepithelial-type cells. Apocrine differentiation may be demonstrated by eosinophilic cytoplasm, decapitation secretion and luminal secretory material. [1,3,6] Depending on the lesion, tubules may be dilated, contain eosinophilic secretions or exhibit limited intraluminal papillary or pseudopapillary projections. The preservation of an orderly architecture and lack of destructive stromal invasion are important features that suggest benignity.

One of the principal diagnostic difficulties is differentiation from syringocystadenoma papilliferum (SCAP). TAA and SCAP share several morphological characteristics and may co-exist within the same lesion. SCAP is typically characterized by cystic invaginations extending from the epidermis, papillary projections and a prominent inflammatory infiltrate, particularly plasma cells. In contrast, a conventional TAA is predominantly composed of tubular structures within the deeper dermis and usually lacks the characteristic cystic epidermal invaginations of SCAP. Nevertheless, these distinctions are not absolute. An interobserver study demonstrated substantial morphological overlap between tubular adenoma and SCAP, particularly when epidermal connection, papillomatosis and inflammatory infiltrates are present.[7] This overlap is particularly relevant in an axillary lesion because the presence of an epidermal connection should not automatically exclude TAA.

Another important differential diagnosis is papillary eccrine adenoma. Historically, TAA and papillary eccrine adenoma have been regarded as distinct entities, but their morphological and immunophenotypic similarities have led some investigators to regard them as part of a broader tubulopapillary adnexal tumour spectrum.[5,8] The distinction may therefore depend on the predominant differentiation identified histologically. A well-developed dual-layered tubular architecture with convincing apocrine characteristics supports the diagnosis of TAA.

Clear cell hidradenoma and other hidradenomatous lesions may also enter the differential diagnosis. These lesions generally demonstrate a more complex epithelial proliferation, often with clear cells and solid or cystic components. In contrast, TAA is predominantly tubular. Metastatic adenocarcinoma is another consideration when a tubular lesion is deeply situated or displays cytological atypia. However, the circumscribed growth pattern, orderly dual-cell architecture, lack of destructive invasion and recognizable apocrine differentiation favour a benign adnexal origin.[1,3]

A Rare Occurrence of Right Axillary Tubular Apocrine Adenoma: A Case Report from South-South Nigeria

Immunohistochemistry may be useful when there is diagnostic difficulty with routine histopathological assessment, although morphology still remains key to diagnosis. Immunohistochemistry was not done and eventually was not required in the index case because of the absence of such histopathological diagnostic difficulties. Markers of epithelial differentiation such as pancytokeratin, CK7, EMA and CEA can support glandular differentiation, while GCDFP-15 may support apocrine differentiation. Myoepithelial markers, including smooth muscle actin, p63 and calponin, can demonstrate the peripheral cell layer surrounding glandular structures. Importantly, none of these markers should be interpreted in isolation because many sweat gland tumours demonstrate overlapping immunophenotypic profiles.[9] In this reported axillary TAA, the histological architecture and benign cytological characteristics sufficed and there was no need for any correlation with immunohistochemical findings.

The rarity of axillary TAA is further illustrated by previous case reports. Attafi et al described a 52-year-old woman with a small, mobile axillary nodule that was excised and diagnosed histologically as TAA.[6] More recently, Palo et al. reported an isolated axillary TAA in a 32-year-old woman, emphasizing unusual microscopic features including epidermal connection, closely packed tubules, mitotic activity and a prominent lymphoplasmacytic response.[2] These observations demonstrate that TAA can display significant morphological variation even within the axillary region. The index case therefore contributes to the limited body of literature documenting TAA in the axilla and highlights the significance of considering this entity when evaluating an unusual axillary cutaneous/subcutaneous mass.

Total surgical excision is usually accepted as the treatment of choice for TAA, as was demonstrated in the index case. Available evidence shows that local excision is usually curative, and recurrence is primarily associated with incomplete removal.[3,10] Histological confirmation of the excision biopsy is therefore required. Although TAA is a benign tumour, unusual lesions showing marked cytological atypia, infiltrative growth or other concerning features warrant careful assessment to exclude malignant transformation or an alternative diagnosis. Although recurrence or malignant characteristics has not been reported in isolated TAA after complete excision, a recent report described a TAA with atypical and potentially malignant features, emphasizing the importance of distinguishing unusual benign morphology from genuine invasive carcinoma, to ensure the appropriate follow-up.[10] In the absence of any malignant characteristics, extensive oncological surgery is generally unnecessary.

From a clinical view point, recognition of TAA is important because an axillary mass may raise concern for lymphadenopathy, metastatic disease or primary axillary breast malignancy. Correct histopathological identification can prevent further unnecessary investigations or excessive aggressive treatment. In addition, documentation of rare lesions such as the index case contributes to the growing understanding of the anatomical distribution and morphological spectrum of apocrine adnexal tumours.

In conclusion, axillary TAA is a particularly uncommon benign adnexal tumour that should be considered in the differential diagnosis of a solitary axillary cutaneous or subcutaneous nodule. Its diagnosis depends solely on careful histopathological examination demonstrating a well-circumscribed tubular proliferation with characteristic apocrine differentiation and preservation of benign architecture with absence of abnormal/increased mitotic activity and cytological atypia. Because of its morphological overlap with syringocystadenoma papilliferum, papillary eccrine adenoma, hidradenoma and, in selected cases, adenocarcinoma, accurate diagnosis requires correlation between clinical findings and microscopic features, with immunohistochemistry reserved for diagnostically difficult cases.

The axilla, though containing abundant apocrine structures, remains an unusual site for isolated TAA, however the index case shows that a high index of suspicion is required when a woman presents to the gynaecology or general surgery outpatient clinic with an axillary cutaneous/subcutaneous mass, because its clinical appearance is non-specific and may mimic other more common axillary lesions. Complete local excision is generally adequate treatment, with follow-up particularly appropriate when excision margins are uncertain or atypical histological features are identified. Reporting more cases will help clarify the biological behaviour, anatomical distribution and relationship of axillary TAA with other axillary masses.

LIST OF ABBREVIATIONS

BMI – Body mass index

CEA – Carcino-embryonic antigen

CK7 – Cytokeratin 7

C/S – Caesarean section

EMA – Epithelial membrane antigen

EUCr – Electrolytes urea and creatinine

FBC – Full blood count

FBS – Fasting blood sugar

GCDFP-15 – Gross Cystic Disease Fluid Protein-15

P53 – Protein 53

RBS – Random blood sugar

SCAP – Syringocystadenoma papilliferum

TAA – Tubular apocrine adenoma

DECLARATIONS

- Ethics approval and consent to participate – not applicable
- Consent for publication - Patient gave written informed consent for her personal and clinical details along with the identifying images to be published
- Availability of data and materials – not applicable
- Competing interests – The authors declare that they have no competing interests
- Funding – no external funding was received
- **Authors' contributions**
 - Dr. Nuvie Oyeyemi – did the pre-operative and post-operative management, the excision biopsy, follow-up, literature review and write up of the manuscript
 - Dr. Tare Dinyain – did the histopathological assessment/evaluation and reporting
 - Both authors reviewed the manuscript
- **Acknowledgements** – Dr. Izein Narugayam who assisted in producing the photomicrographs and Ns. Esther Oke who assisted in the procedure (excision biopsy) and in the post-operative management of the patient.

REFERENCES

- 1) Landry M, Winkelmann RK. An Unusual Tubular Apocrine Adenoma: Histochemical and Ultrastructural Study. *Arch Dermatol*. 1972;105(6):869–879. doi:10.1001/archderm.1972.01620090041009.
- 2) Palo S, Somalwar SB, Ramavath K. Isolated Tubular Apocrine Adenoma of Axilla: Atypical Microscopic Manifestations in an Uncommon Entity. *Indian J Dermatol*. 2024 Jul-Aug;69(4):348-350. doi: 10.4103/ijd.ijd_71_24. Epub 2024 Aug 19. PMID: 39296683; PMCID: PMC11407550.
- 3) Choi J, Seo JH, Choi JY, Seo BF, Kwon H, Jung SN. Apocrine tubular adenoma on the palm: A case report. *Medicine (Baltimore)*. 2021 Dec 10;100(49):e28002. doi: 10.1097/MD.00000000000028002. PMID: 34889245; PMCID: PMC8663837.
- 4) Umbert P, Winkelmann RK. Tubular apocrine adenoma. *J Cutan Pathol*. 1976;3(2):75–87. doi:10.1111/j.1600-0560.1976.tb00850.x.
- 5) Kazakov DV, et al. Tubular adenoma of the skin with follicular and sebaceous differentiation: a report of two cases. *Am J Dermatopathol*. 2006;28(2):142–146. doi:10.1097/01.dad.0000171602.63433.51.
- 6) Attafi S, Smichi I, Rkik W. Tubular apocrine adenoma of the axilla: a rare adnexal tumor. *Our Dermatol Online*. 2015;6(3):360–361. doi:10.7241/ourd.20153.97.
- 7) Kazakov DV, Bisceglia M, Calonje E, Hantschke M, Kutzner H, Mentzel T et al. Tubular adenoma and syringocystadenoma papilliferum: a reappraisal of their relationship. An interobserver study of a series, by a panel of dermatopathologists. *Am J Dermatopathol*. 2007 Jun;29(3):256-63. doi: 10.1097/DAD.0b013e3180576fd9. PMID: 17519623.
- 8) Fox SB, Cotton DW. Tubular apocrine adenoma and papillary eccrine adenoma. Entities or unity? *Am J Dermatopathol*. 1992;14(2):149–154. doi:10.1097/00000372-199204000-00013.
- 9) Aktepe, F., Demir, Y., & Dilek, F. H. (2003). Tubular Apocrine Adenoma in Association with Syringocystadenoma Papilliferum. *Dermatology Online Journal*, 9(1). <http://dx.doi.org/10.5070/D33997q02m>.
- 10) Tokuchi K, Yanagi T, Maeda T, Nakazato S, Miyamoto K, Tomaru U, et al. Tubular apocrine adenoma with uncertain malignant findings: report of a case and review of the literature. *Case Rep Dermatol*. 2025;17(1):240–245. doi:10.1159/000545712.