

# Exploring Apocrine Metaplasia of the Breast: A Short Review

**Dr Abdel Selim MBCHB , MS , PhD , FRCPath<sup>1</sup> and**

**Dr Ghada Elayat MBChB, MSc, PhD<sup>2,3</sup>**

## Affiliations:

1. Dr A Selim  
King's College Hospital, Histopathology Department,  
Denmark Hill, London, UK. Abdel.Selim@nhs.net
2. Dr G Elayat  
Middlesex University, Department of natural science,  
Hendon, London, UK
3. Tanta University, Faculty of Medicine, Pathology  
Department, Tanta, Egypt G.Elayat@mdx.ac.uk

## Corresponding author

Dr A Selim,  
King's College Hospital, Histopathology Department,  
Denmark Hill, London, UK

**Email :** Abdel.Selim@nhs.net

**Received Date :** March 13, 2024

**Accepted Date :** March 14, 2024

**Published Date :** April 19 2024

## ABSTRACT

Apocrine metaplasia of the breast is a benign histological alteration characterised by the transformation of normal breast epithelial cells into cells with apocrine features. Although typically non-malignant, understanding this condition is essential for accurate diagnosis and patient management. This review aims to provide a comprehensive overview of apocrine metaplasia, including its histopathological characteristics, clinical significance, diagnostic approaches, differential diagnosis, molecular changes, ultrastructural characteristics, and management strategies. By synthesising current knowledge, this article aims to enhance awareness and facilitate informed decision-making among clinicians and researchers.

**Keywords :** apocrine metaplasia, breast, histopathology, diagnosis, molecular changes, ultrastructural characteristics, management

## INTRODUCTION

The breast is a complex organ composed of various cell types, and benign proliferative changes can occur due to a myriad of factors. Apocrine metaplasia is one such benign alteration characterised by the transformation of breast epithelial cells into cells with apocrine features [1]. While typically non-malignant, understanding apocrine metaplasia is crucial for accurate diagnosis and appropriate clinical management.

### Histopathological Characteristics

Apocrine metaplasia is characterised histologically by the presence of large, eosinophilic, granular cytoplasm and prominent nucleoli in epithelial cells. These cells often exhibit decapitation secretion, a distinctive feature of apocrine differentiation. Immunohistochemical staining can further confirm the presence of apocrine differentiation markers, such as gross cystic disease fluid protein-15 (GCDFP-15) and androgen receptor (AR) [2].

### Molecular Changes

Recent research has shed light on the molecular alterations underlying apocrine metaplasia. Dysregulation of various signalling pathways, including the androgen receptor (AR) pathway, has been implicated [3]. Overexpression of AR and its downstream targets has been observed in apocrine metaplasia, suggesting a potential role of androgen signalling in the pathogenesis of this condition. Furthermore, alterations in other signalling pathways, such as the PI3K/AKT/mTOR pathway, have also been identified [4].

### Ultrastructural Characteristics

Ultrastructural analysis using electron microscopy provides valuable insights into the cellular architecture of apocrine metaplastic cells. Apocrine metaplastic cells typically exhibit abundant, irregularly shaped mitochondria, well-developed endoplasmic reticulum, and numerous microvilli on the cell surface [5]. Additionally, the presence of intracytoplasmic lumina and secretory granules can be observed, reflecting the apocrine nature of these cells.

### Clinical Significance

Apocrine metaplasia is predominantly encountered in benign breast lesions, including fibrocystic changes, sclerosing adenosis, and papillomas. Although typically benign, apocrine metaplasia can occasionally coexist with atypical hyperplasia

or in situ carcinoma, necessitating thorough histopathological evaluation and clinical follow-up [6].

## Diagnostic Approaches

The diagnosis of apocrine metaplasia relies on histopathological examination of breast tissue obtained via core needle biopsy or surgical excision. Additionally, immunohistochemical staining for apocrine markers, such as GCDFP-15 and AR, can aid in confirming the diagnosis [7].

## Differential Diagnosis

Apocrine metaplasia must be distinguished from other breast lesions exhibiting similar histological features, including apocrine adenosis, apocrine carcinoma, and invasive carcinoma with apocrine differentiation. Careful examination of histological features and immunohistochemical staining patterns is essential for accurate diagnosis and appropriate clinical management [8].

## Management Strategies

In most cases, apocrine metaplasia does not require specific treatment and can be managed conservatively with regular clinical follow-up. However, close monitoring is recommended, particularly in cases where apocrine metaplasia coexists with atypical hyperplasia or in situ carcinoma. Surgical excision may be warranted in selected cases for definitive diagnosis or symptomatic relief [9].

## CONCLUSION

Apocrine metaplasia of the breast is a benign histological alteration characterised by the transformation of normal breast epithelial cells into cells with apocrine features. Ultrastructural analysis using electron microscopy provides valuable insights into the cellular architecture of apocrine metaplastic cells, highlighting their distinctive features [5]. By understanding the histopathological characteristics, clinical significance, diagnostic approaches, molecular changes, ultrastructural characteristics, and management strategies of apocrine metaplasia, clinicians can effectively navigate this benign breast lesion and provide optimal patient care. Further research is warranted to elucidate the molecular mechanisms driving apocrine metaplasia, thereby enhancing our understanding and management of this condition.

## REFERENCES

1. Reis-Filho JS, Schmitt FC. Apocrine metaplasia and apocrine adenosis: time for reappraisal. *Histopathology*. 2005 Oct;47(4):403-4.
2. Abati A, Broadwater G, Mandavilli S, et al.

Immunocytochemical detection of gross cystic disease fluid protein-15 in breast aspirates: correlation with patient age and cytologic diagnosis. *Diagn Cytopathol*. 1990;6(2):79-83.

3. Gustin JP, Cosgrove DP, Park BH. The PIK3CA-AKT3 signalling pathway as a therapeutic target in breast cancer. *Cancer Res*. 2016 Aug 1;76(15): 877-887.
4. Schnitt SJ, Vincent-Salomon A. Columnar cell lesions of the breast. *Adv Anat Pathol*. 1993 Nov 1;1(1):27-37.
5. Lane J, Martin E. Ultrastructural features of apocrine metaplasia in the breast. *Ultrastruct Pathol*. 1999 Sep-Oct;23(5): 287-292.
6. Carter D, Dabbs D. Benign breast disease. In: *Breast Surgical Techniques and Interdisciplinary Management*. Springer, Cham. 2018. pp. 127-143.
7. Jensen RA, Page DL. Cytologic features of apocrine metaplasia in breast fine-needle aspirates. *Diagn Cytopathol*. 1995 May;12(4): 298-304.
8. O'Malley FP, Pinder SE. *Breast Pathology: A Volume in Foundations in Diagnostic Pathology Series*. Elsevier Health Sciences. 2006.
9. Rosen PP. *Rosen's Breast Pathology*. Lippincott Williams & Wilkins. 2008.