The Apocrine Conundrum

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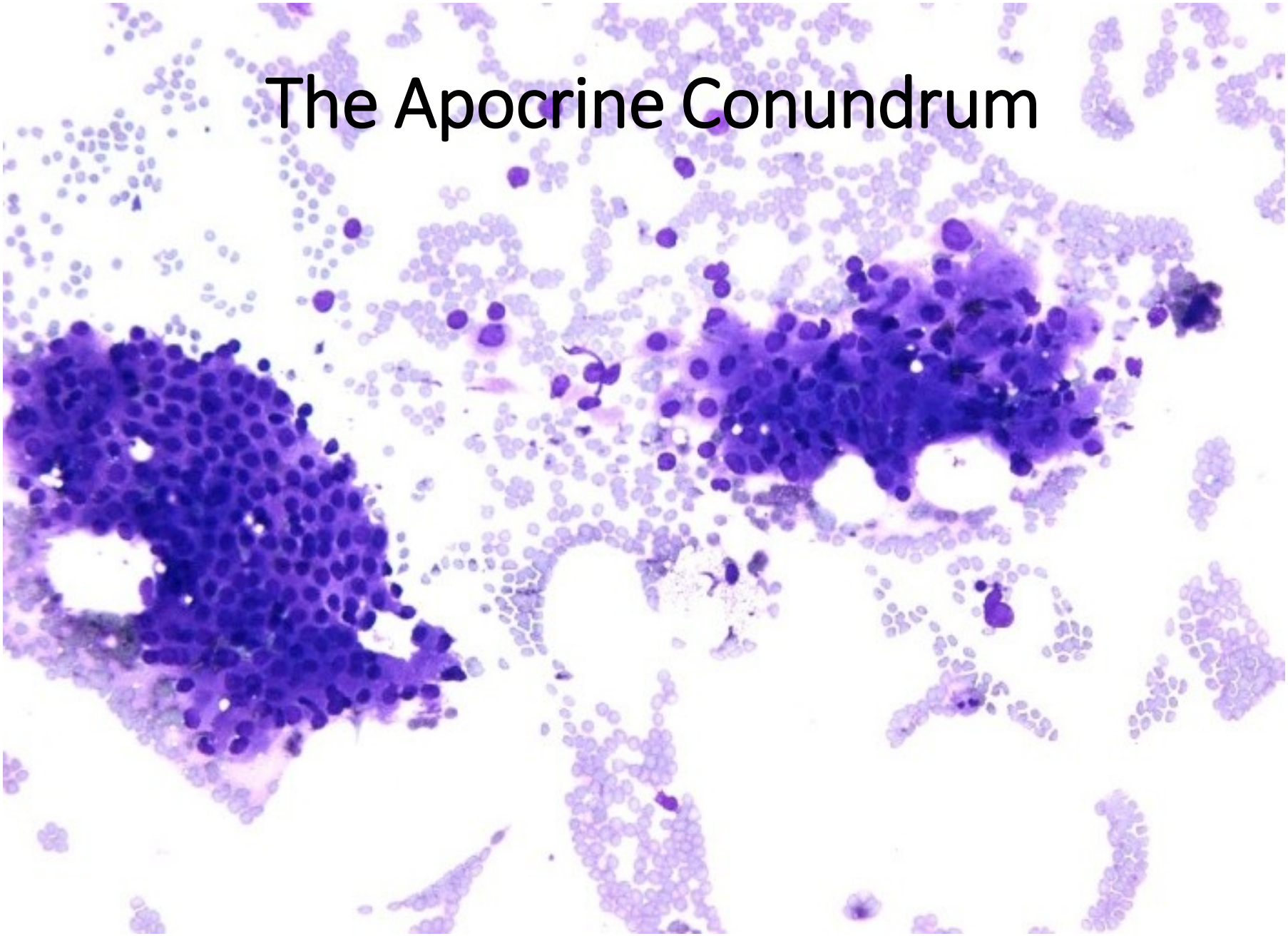
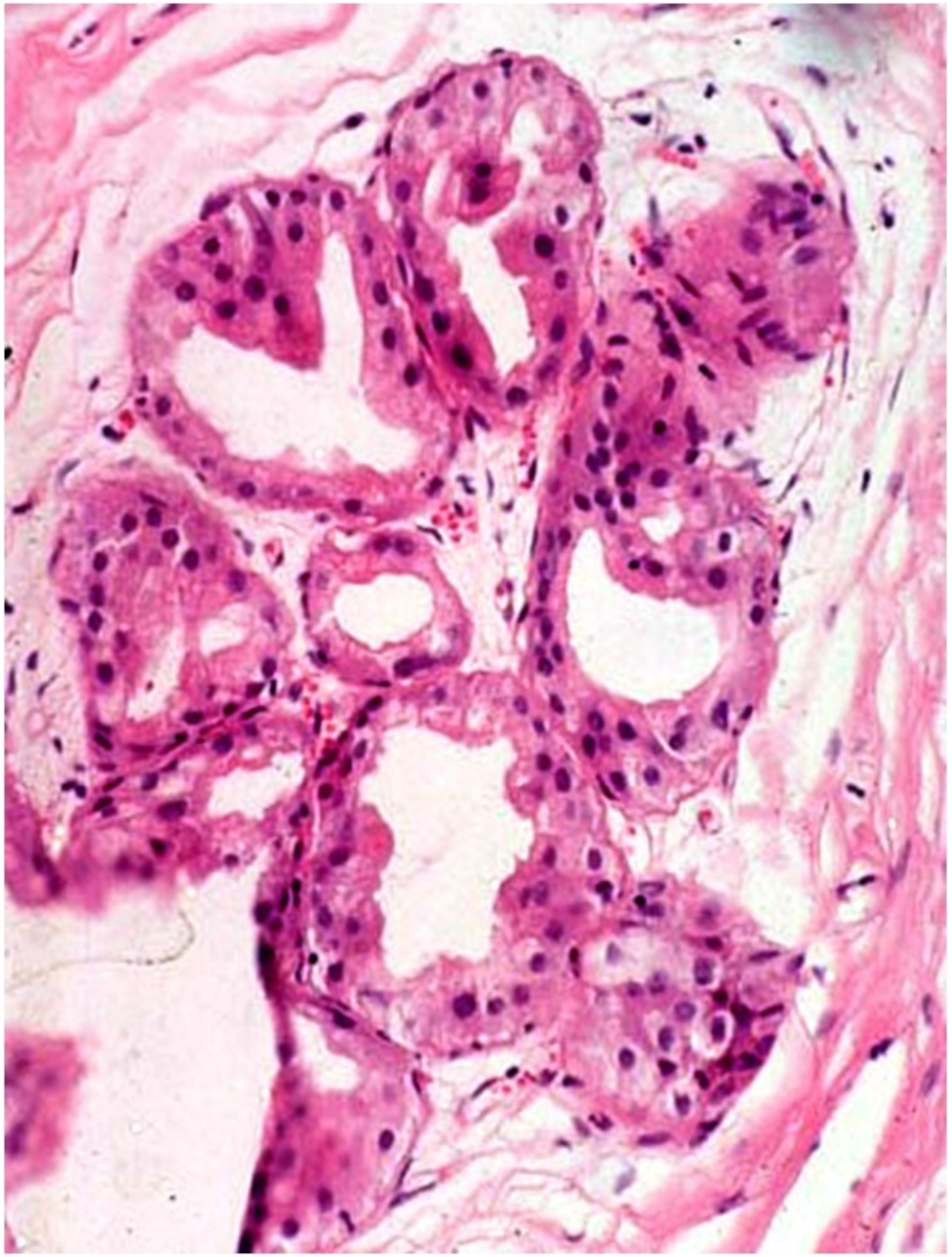
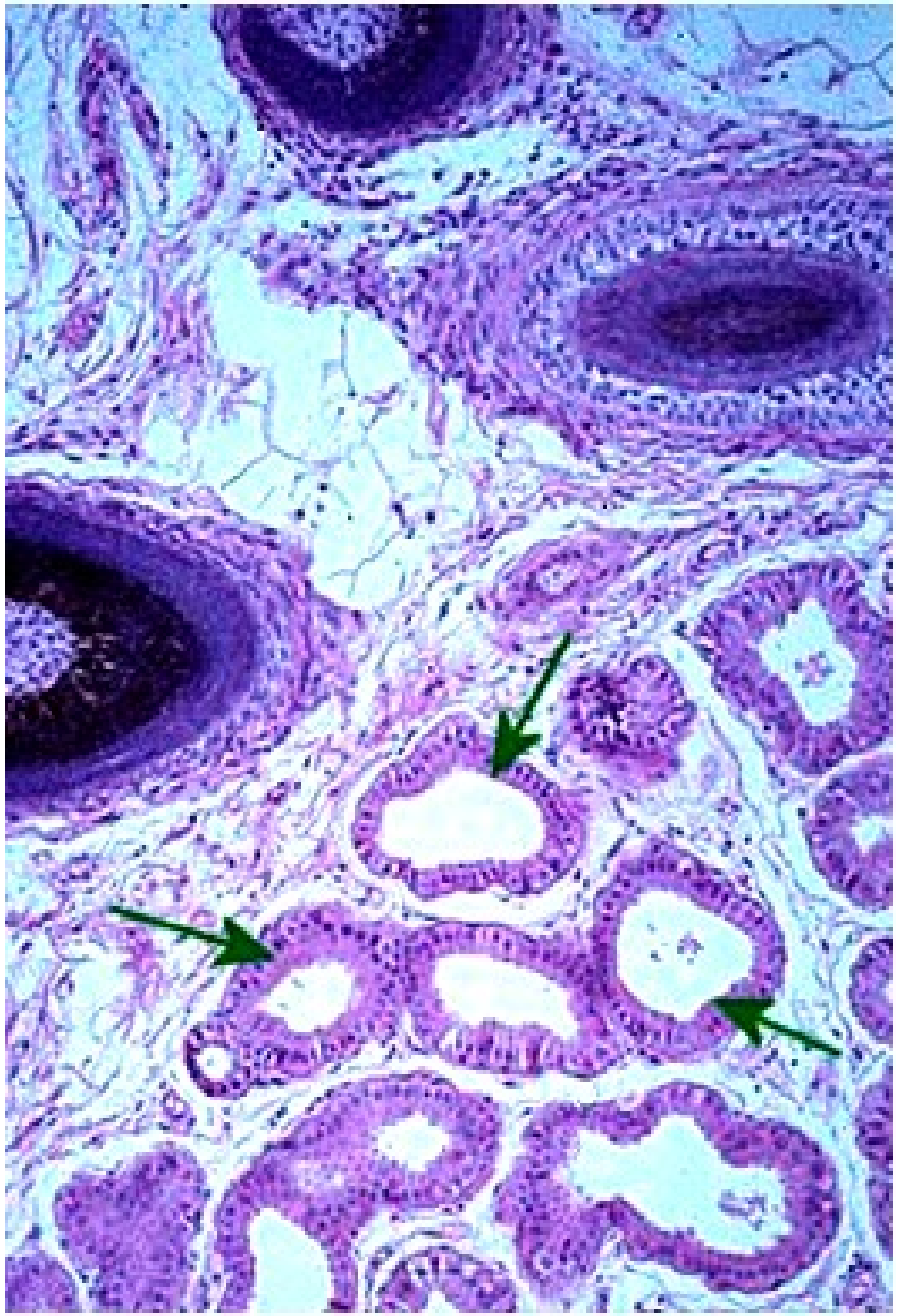


Apocrine

Apocrine is derived from Greek word “Apokrnein” which means to *set apart or to separate*

Apocrine material is a type of glandular secretion in which the apical portion of the secreting cell is released along with the secretory products





Apocrine glands

Type of glands found in the skin, breast, eyelid and ear

They produce an oily secretion of sweat (apical part of the cell and other secretory products)

Apocrine glands in the breast secrete fat droplets into breast milk

Apocrine glands in the ear help form earwax

Apocrine gland

Most apocrine glands in the skin are in the axilla, anogenital region and around the nipple

Apocrine glands in the skin are scent glands and their secretion has an odour

Apocrine secretion is odourless until digested by bacteria

A pungent, musky, urinous and animal-like scent produced by apocrine secretions in the axilla and anogenital area

Can be emotionally stimulating and sexually attractive

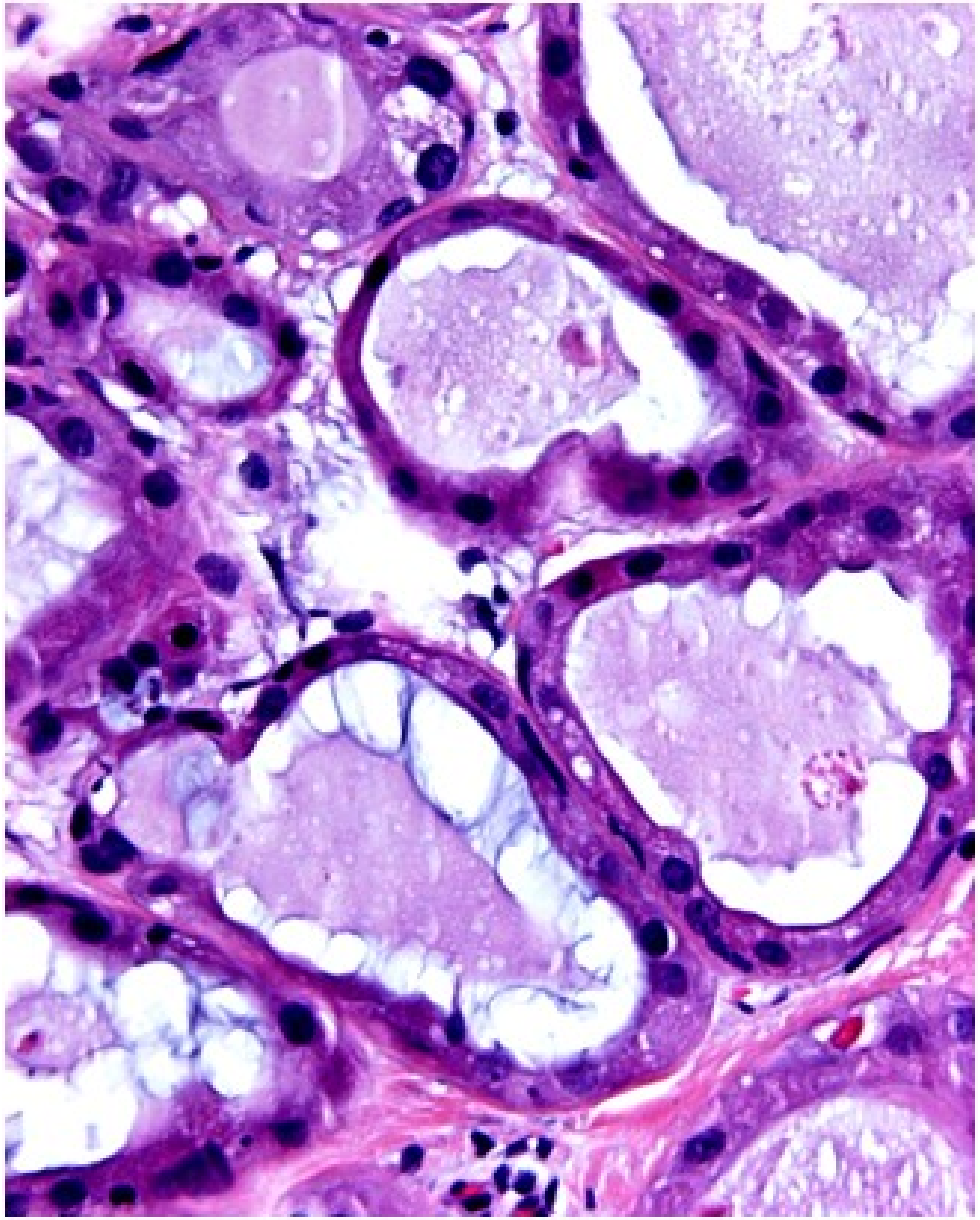
Apocrine odour

Apocrine odout which increases after puberty, is thought represent messages of personal identity, territoriality and courtship

Many consider apocrine odour offensive (sign of poor grooming) and use deodorants to mask its smell

Ironically, some deodorants, colognes, and perfumes contain scents designed to mimic the apocrine odour

Apocrine secretions are controlled by sympathetic nervous system and are highly responsive to emotional stimuli



Apocrine changes in the breast

Apocrine change is common in the female breast, especially after the age of 30 years

Incidence increases with age

Apocrine change persists postmenopausally

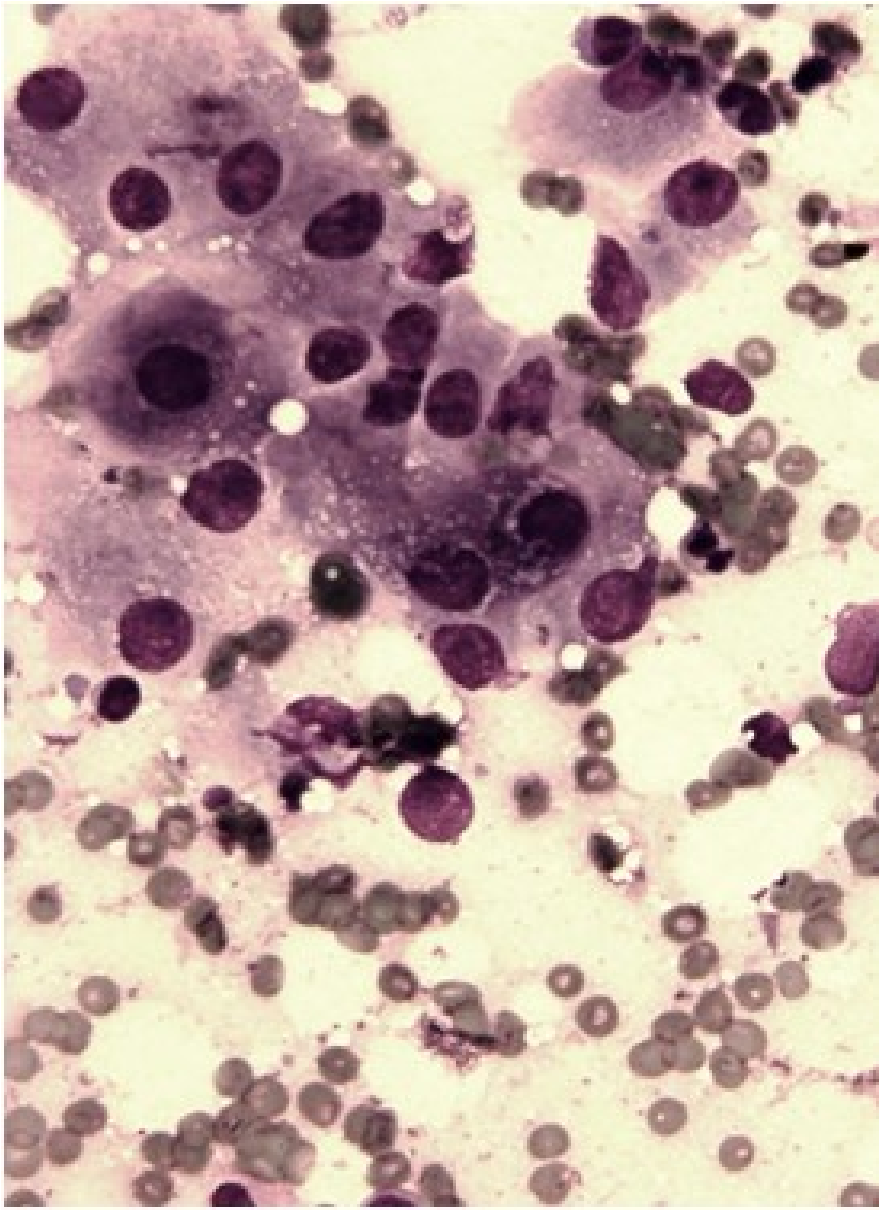
Regarded as a metaplastic process

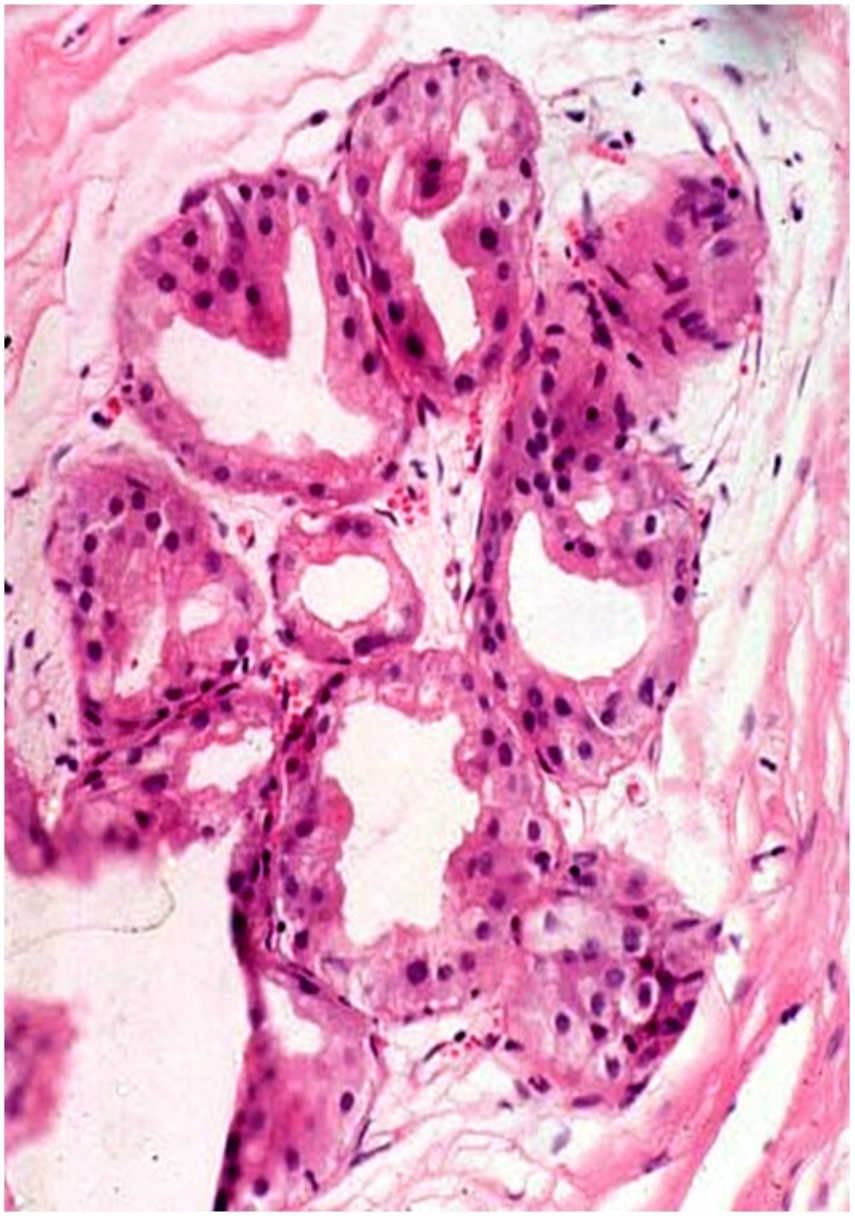
Apocrine changes in the breast

Normal component of the glandular structure of the breast

Apocrine cells are found during human foetal breast development as well as in normal adult breast

Focal apocrine metaplasia within epithelial proliferations of the breast is generally regarded as an important indicator of the diagnosis of benignity





Characteristics of apocrine cells

Large cell with markedly PAS positive eosinophilic granular cytoplasm and apical snouts
Large and moderately vesicular nuclei and prominent nucleoli
Express gross cystic disease fluid protein (GCDFP)
Lack oestrogen and progesterone receptors but stain positively for androgen receptor

Apocrine lesions of the breast

Apocrine metaplasia

Apocrine cysts

Apocrine adenosis/adenoma

Atypical/borderline apocrine change

Apocrine ductal carcinoma in-situ

Apocrine carcinoma

Gross apocrine cyst formation

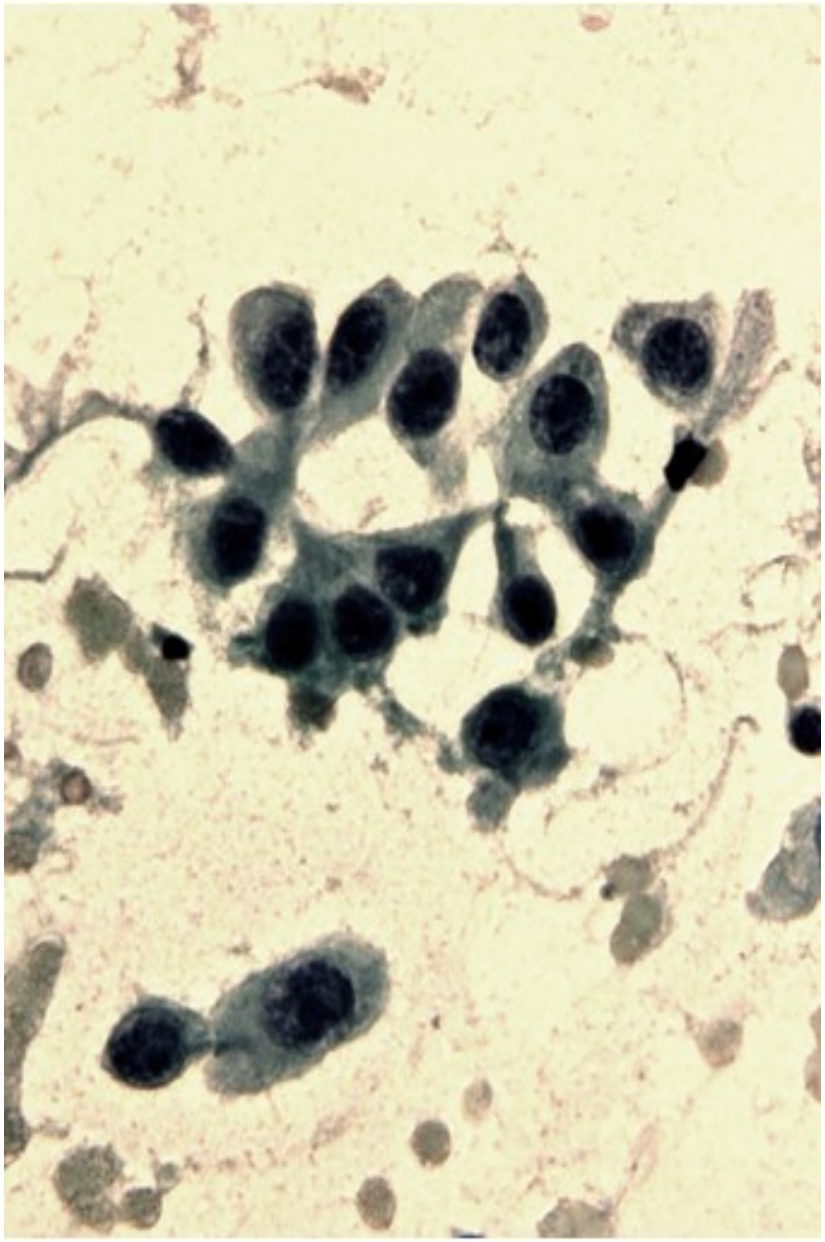
Most patients with apocrine cyst are are perimenopausal

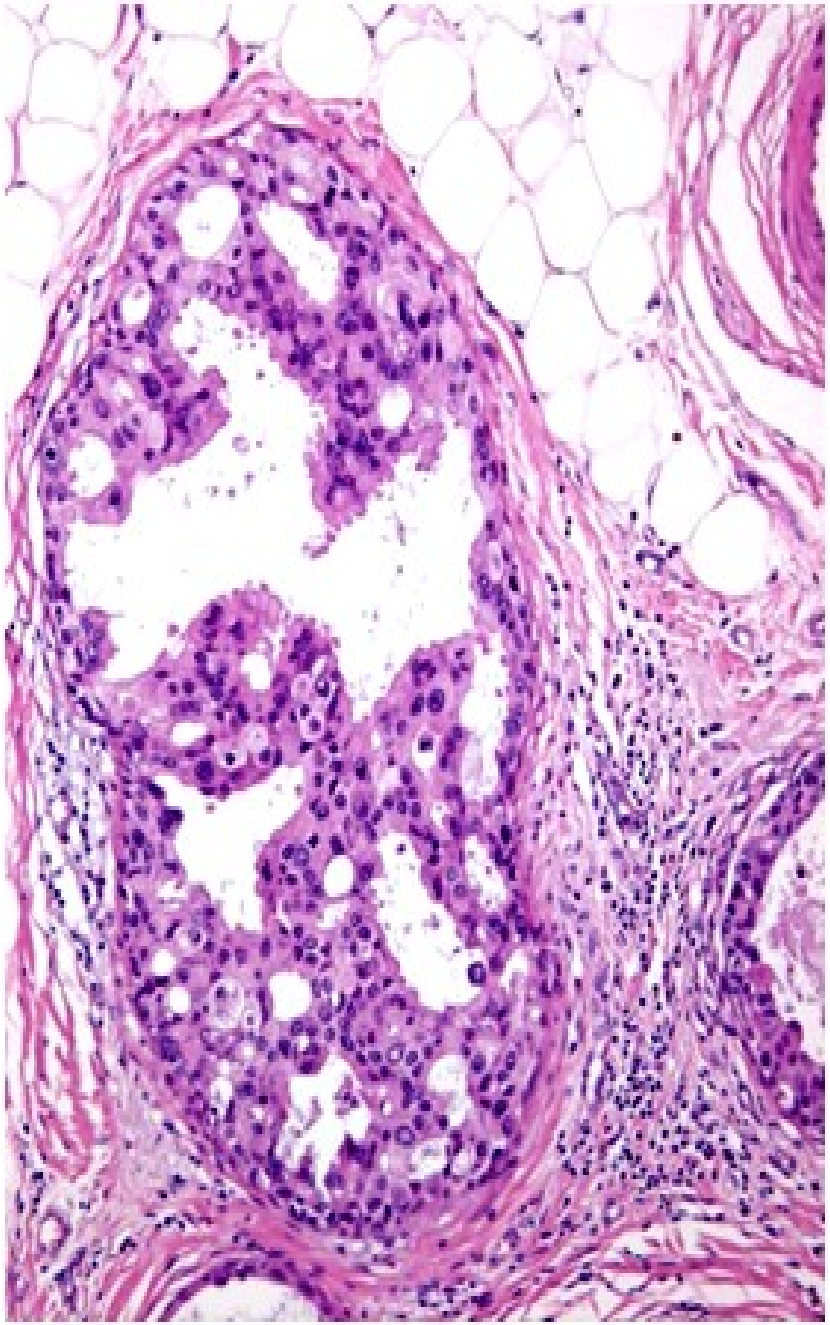
Single or multiple cysts

Apocrine cysts have high potassium contents

Slight increase risk of subsequent carcinoma

- Family history
- Palpable cysts
- Young women
- Epithelial proliferation





Papillary apocrine change

Small non-proliferative cysts are not associated with increased risk of carcinoma

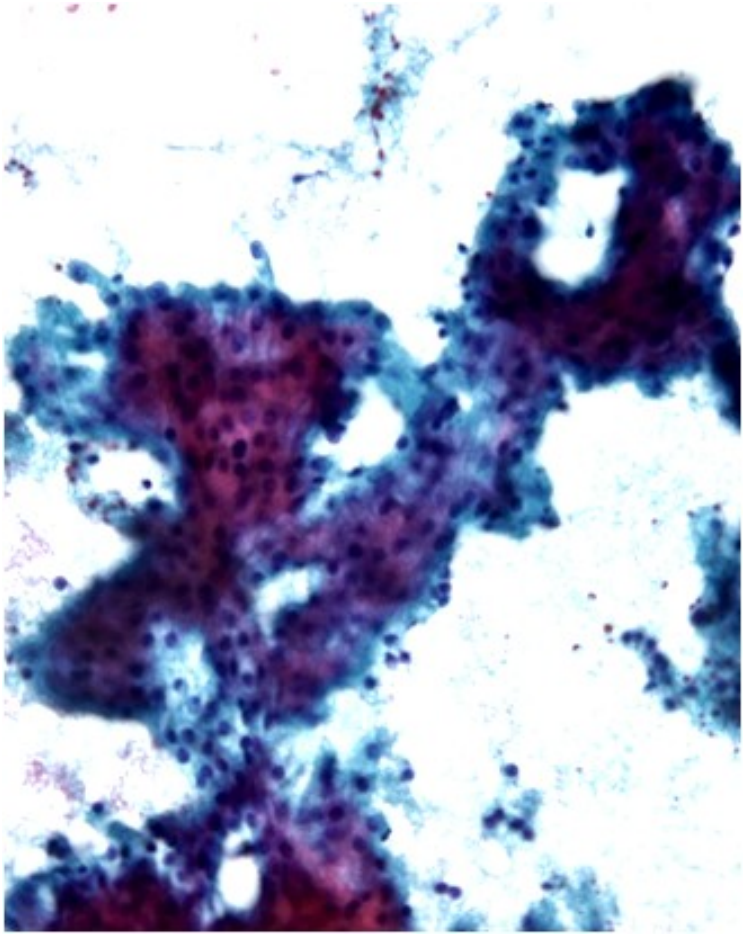
Small cysts lined with hyperplastic epithelium carry a slightly elevated risk of carcinoma

The elevated risk is related to atypical hyperplasia and complex architecture

Some of these cases appear to represent clonal proliferation

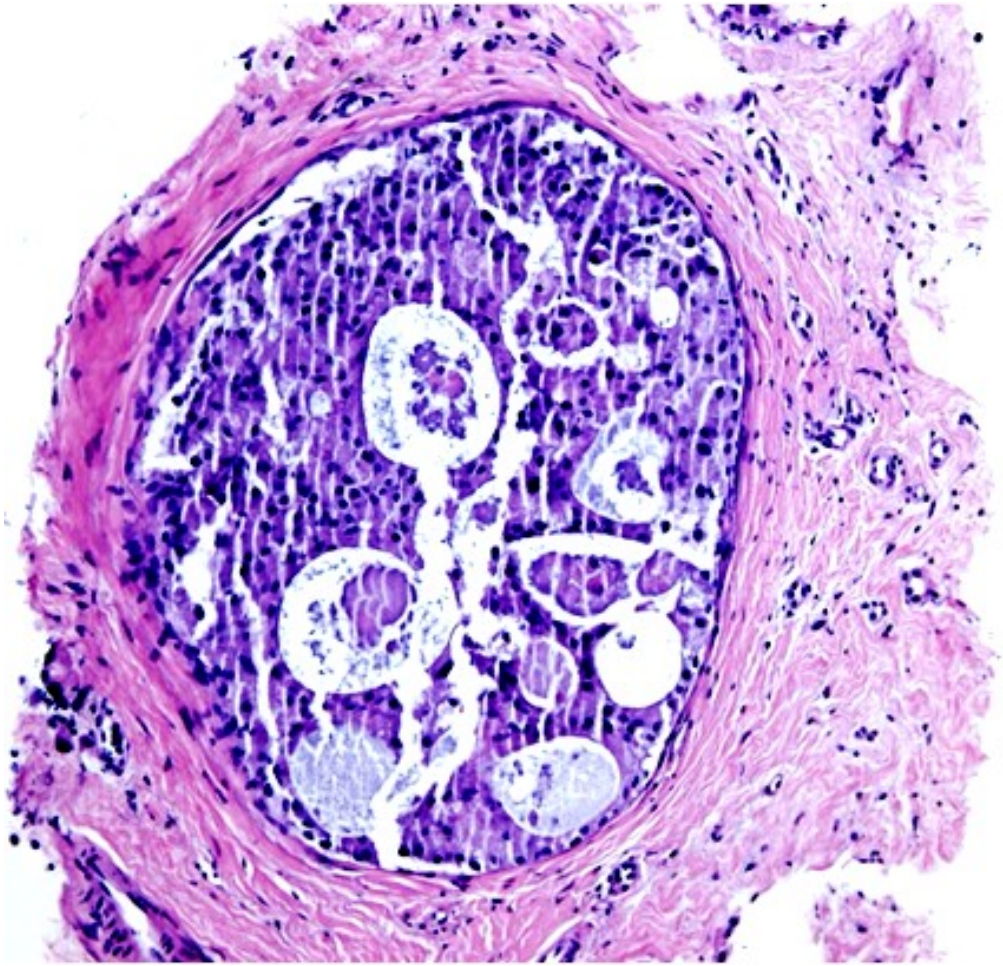
Atypical apocrine proliferation

Nuclear enlargement (3-fold) and nuclear size variability, slightly irregular nuclear membranes, small nucleoli



The Relative Risk (RR) of malignancy is 5.5 but in women older than 60 years of age the RR is 14

Have some, but not all, of the features of DCIS and may represents cancerisation of lobules



Apocrine DCIS

Extensive proliferation of apocrine cells

Marked nuclear pleomorphism

Enlarged nuclei
Multiple prominent nucleoli

Irregular nuclear membranes

Comedo-type necrosis

Invasive apocrine carcinoma

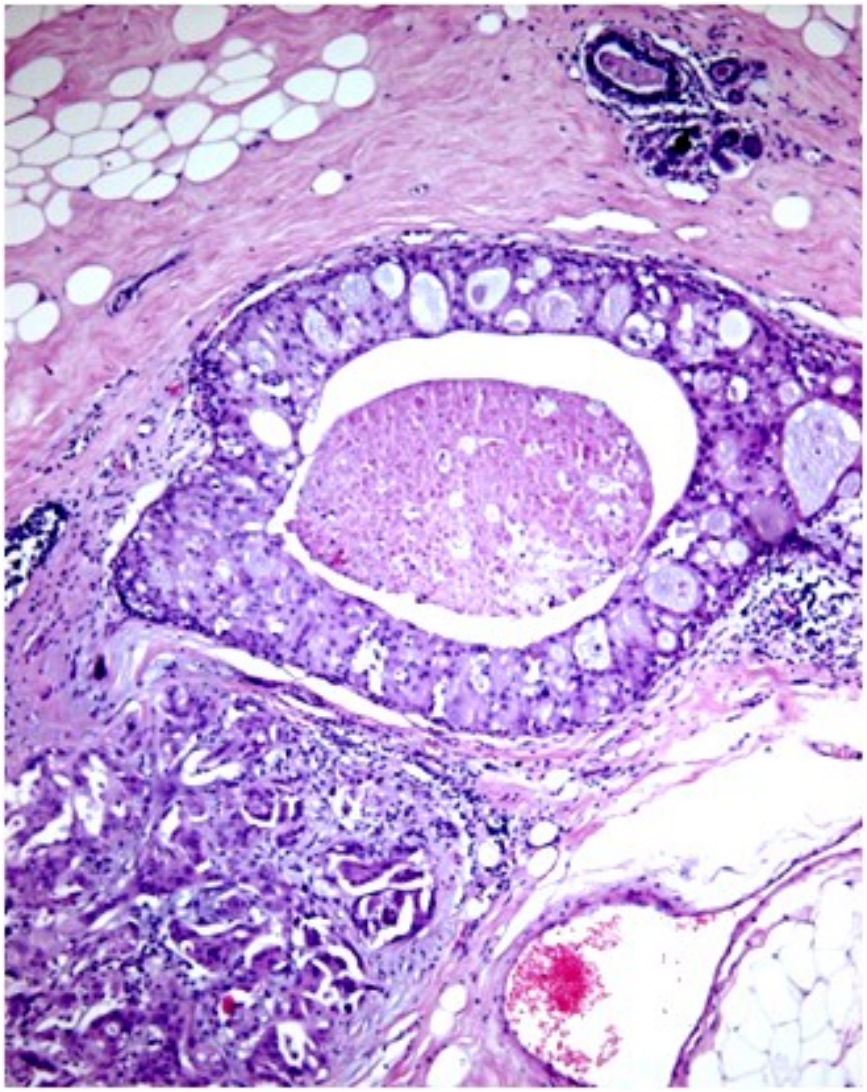
1-2% of breast cancers

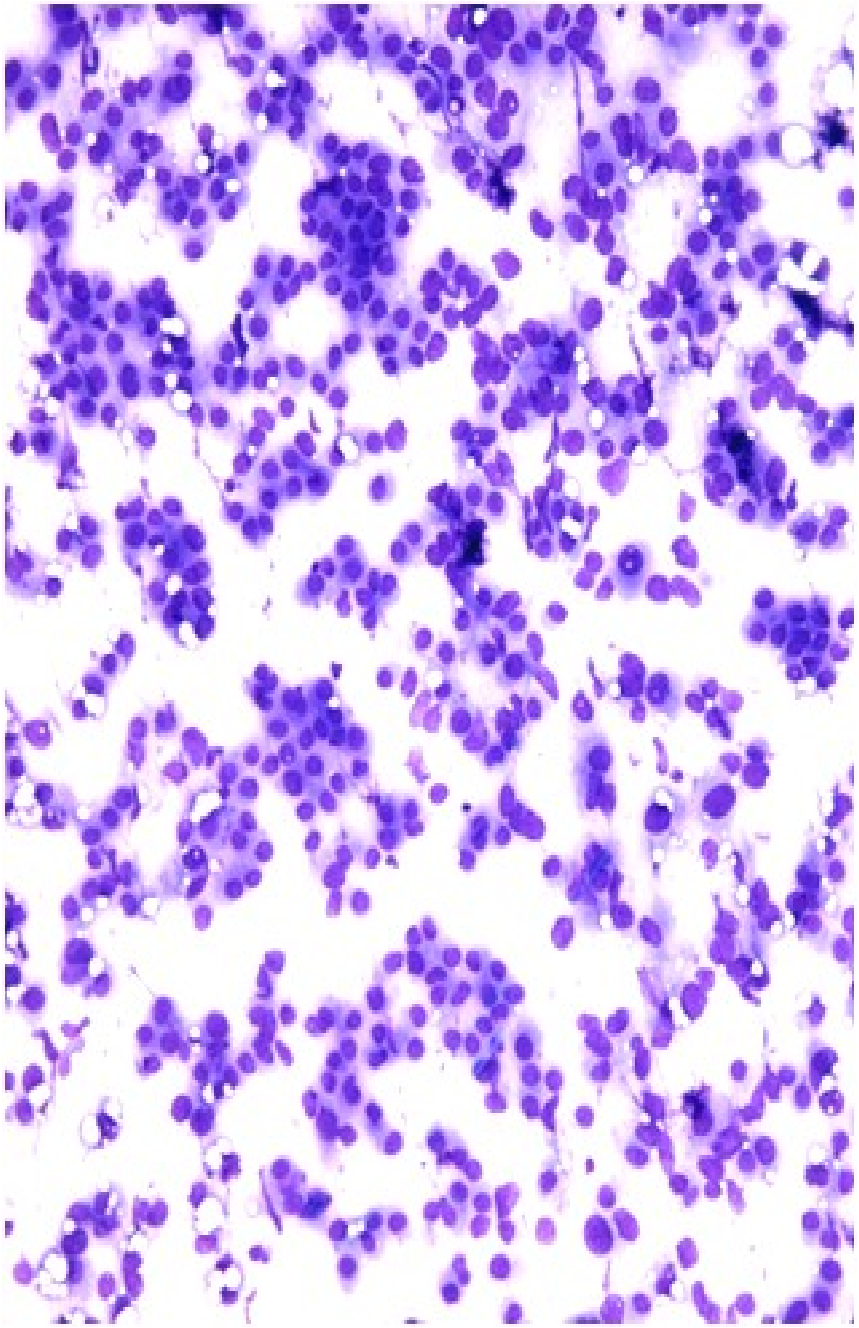
Greater than 90% of the epithelium has apocrine features

PAS positive cytoplasmic granules

Immunoreactivity with GCDFP

Empty vesicle and osmiophilic vesicle at the ultrastructural level





Invasive apocrine carcinoma

Clinical presentation, tumour size, tumour grade and lymph node status do not differ significantly from NST cancers

No difference in survival between the 2 groups

ER and PR negative

AR positive

Her2 status is not fully formalised

P53 and p21 expression is seen in 50%

Molecular studies of apocrine lesions

Apocrine hyperplasia shows no loss of heterozygosity at loci associated with invasive carcinoma

Papillary apocrine hyperplasia, apocrine carcinoma in-situ and invasive apocrine carcinoma show similar molecular alterations

Number of alteration is lower in papillary apocrine hyperplasia compared with in-situ and invasive apocrine carcinomas

Apocrine hyperplasia often shows

- Gains in chromosomes 1p, 2q and 13q
- Losses of 1p, 2p, 10q, 16q, 17q and 22q

Malignant apocrine lesions show

Gains of 1p, 1q and 2q

Losses of 1p, 16q, 17q and 22q

The molecular alterations in benign proliferative apocrine lesions suggest that at least some of these lesions may be clonal in nature

The mean number of alterations by comparative genomic hybridisation has been found to be 5 in apocrine hyperplasia, 10 in apocrine DCIS and 15 in invasive apocrine carcinoma

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