

# Common misconceptions regarding neoplasia

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## Dysplasia



### Misconception

### Correction

\* Dysplastic cells have invaded the basement membrane

• No basement membrane or stromal invasion

\* Dysplastic cells are poorly differentiated/undifferentiated

• Differentiation is described for invasive cancer, rather than dysplastic cells

\* Dysplastic cells are not neoplastic

• Dysplasia is an early part of the neoplastic process

\* Dysplastic cells show pavingting



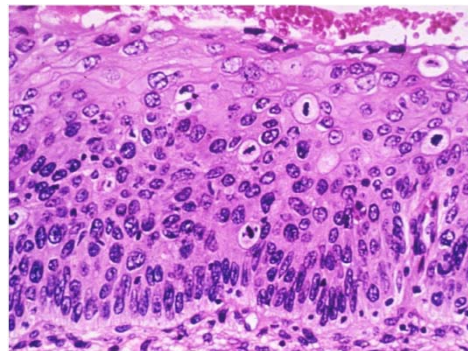
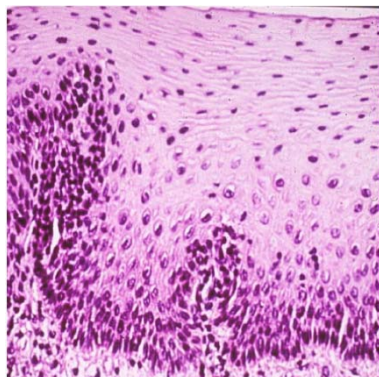
• Pavingting is simply a feature of squamous differentiation (benign or malignant). It does not denote dysplasia or neoplasia.

\* Dysplasia is encapsulated

• Dysplasia is not mass-forming. It is an intraepithelial process, and appears grossly either normal or as a flat patch of colour change, but NO MASS (Mass - neoplasm – benign or malignant)

- Dysplasia is part of the neoplastic process
  - The cells have some genetic changes early in the course of malignant transformation, but do not yet have the capability to invade and metastasize (i.e. premalignant change)
  - Terminology: dysplasia = intraepithelial neoplasia
  - What tissues?
    - Epithelial tissues eg. squamous epithelium (skin, cervix, metaplastic squamous epithelium in lung); glandular epithelium (eg. tubular adenoma in colon)
  - Characteristics?
    - Cells are still bound by basement membrane.
    - There can be varying grades of dysplasia – low grade (least severe), high grade, carcinoma-in-situ (most severe)

- Morphology?
  - Grossly – May be a change in colour eg reddish or pale appearance of mucosa, but NO MASS lesion
  - Similar to features in malignant cells, but may be less severe
  - Most severe changes are in carcinoma-in-situ
    - Stratified squamous epithelium: full thickness dysplasia (vs low grade dysplasia – changes more in basal layers)
  - Cells do NOT breach the basement membrane; NO stromal invasion; NO desmoplasia
- Benign stratified squamous epithelium
- High grade dysplasia



## Mechanism of HPV induced cervical intraepithelial neoplasia



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| <ul style="list-style-type: none"> <li>• <b>Misconception</b></li> <li>• Mechanism is by insertional mutagenesis</li> <li>• E6 and E7 genes act on p53 and RB genes</li> <li>• E6 and E7 proteins act on p53 and RB genes</li> <li>• p53 and RB genes bring about regulatory effects on cell cycle, DNA repair and apoptosis</li> </ul> | <ul style="list-style-type: none"> <li>• <b>Correction</b></li> <li>• Mechanism is by viral oncoproteins acting on host proteins (not by causing mutations at the gene level)</li> <li>• E6 and E7 protein (gene products) act on p53 and RB proteins (gene products), <i>NOT</i> the genes themselves</li> <li>• The regulatory effects are brought about by p53 and RB proteins (gene products), not the genes themselves – they need to be translated into proteins first!</li> </ul> |
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## Grading of cancer



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|---|---|
| <ul style="list-style-type: none"> <li>• <b>Misconception</b></li> <li>• Grading is used to decide of a neoplasm is benign or malignant</li> <li>• (i.e. low grade tumours are benign while high grade tumours are malignant)</li> <li>• In low grade / well differentiated tumours, the cell look normal</li> <li>• In breast carcinoma, myoepithelial cells are present in low grade carcinoma</li> </ul> | <ul style="list-style-type: none"> <li>• <b>Correction</b></li> <li>• Grading and Staging are performed specifically on MALIGNANT tumours, i.e. cancer (“cancer” means it is by definition malignant –i.e. infiltrative, can spread via lymphatics and blood etc.)</li> <li>• In low grade tumours, the cells are already cytologically malignant. But the tumour cells and architecture still resembles benign counterpart i.e. forms glands if adenoca, forms keratin pearls if squamous</li> <li>• Myoepithelial cells are absent in low grade invasive breast carcinoma.</li> </ul> |
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## Grading of cancer

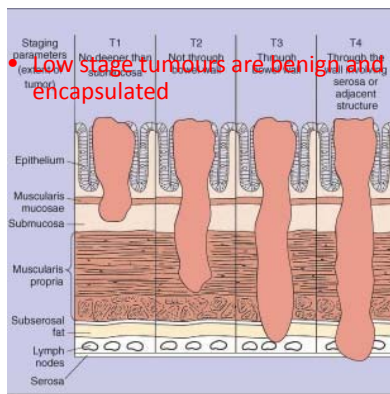


- Misconception
  - In lung carcinoma, low grade carcinoma shows ciliated columnar cells, while high grade carcinoma is squamous cell carcinoma
- Correction
  - Each carcinoma type can be low or high grade. They do not change types from low to high grade.
  - Ciliated columnar cells are almost always benign. In adenocarcinoma, cilia are not seen.
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## Staging of cancer



- Misconception
  - Grading is part of staging
- Correction
  - Grading and Staging are different ways to assess tumour behavior and prognosis, and are independent.
  - Staging is applied to already established cancer (i.e. invasive malignancy), Hence there is no benign encapsulated stage. The earliest stage is Tis – in-situ carcinoma, which is included for completeness.



- All other stages T1-4 involve malignant tumours that have already penetrated the basement membrane and are invasive. Stages of T1-4 would assess parameters like size, depth of penetration of primary organ, and involvement of adjacent tissues.



# The End

Keep Calm and Study On