



# MSS

## PATHOLOGY

# 10



**WRITER:**  
Osama Younis

**CORRECTOR:**  
Juman Hiyari

**DOCTOR:**  
Mousa Al-Abbadi

# Introduction:

Anything the doctor says will be in **RED**.

Anything written in the slides will be in **BLACK**.

Anything written in the book will be in **BLUE**.

Anything I write from google or as a clarification will be in **( )**.

Anything **highlighted** in yellow should be memorized.

## Topics covered:

- General facts about skin cysts and neoplasms ... Page 3
- Solar (actinic) elastosis ... Page 4
- Actinic keratosis ... Page 6
- Seborrheic Keratosis ... Page 7
- Skin Cysts ... Page 9
  - Epidermal (epithelial) Inclusion cysts
  - Dermoid Cysts
- Squamous cell carcinoma ... Page 11
- Basal Cell carcinoma ... Page 13

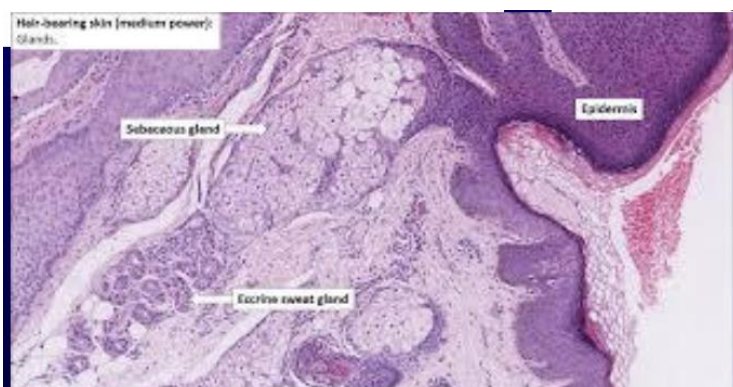
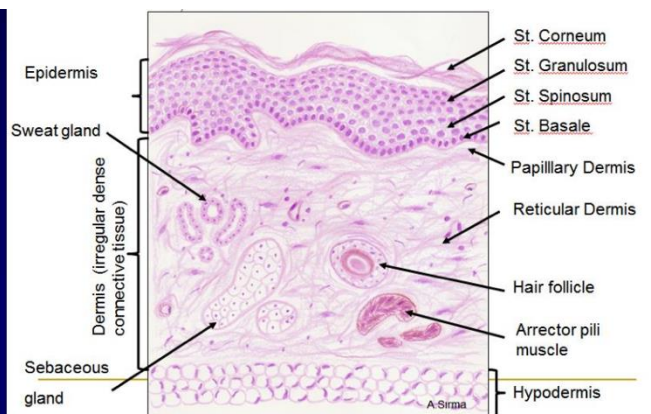
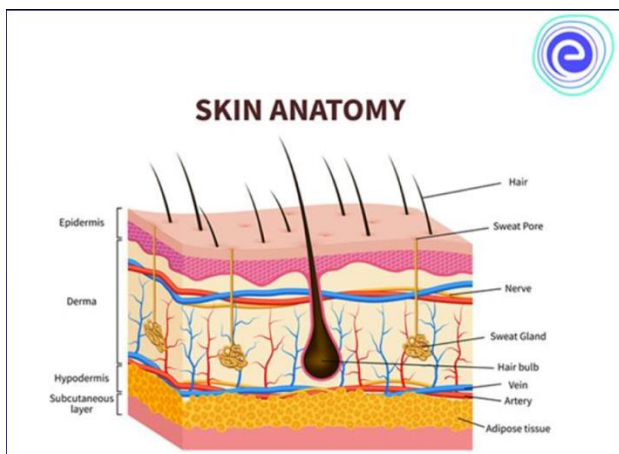
Sheet 8 forgot to mention that the doctor focused on the translocation that occurs in Ewing's sarcoma, so please be careful and memorize it.



t(11;22)(q24;q12);  
t(17;22)(q12;q12);

# General facts about skin cysts and neoplasms:

- Very common lesions
- Incidence increases with age.
- They are rarely fatal (except melanomas)
- They usually occur on areas exposed to sunlight
- Incidence is associated with sun damage (explains the previous point.) **\*More common in fair skinned people.**



Tumors can arise from anywhere

on the skin.

# Solar (actinic) elastosis:

## Etiology:

- Prolonged exposure to sun UV rays damages the collagen and elastic fibers of the skin which leads to a decrease in skin elasticity.
- (The condition mainly happens due to the accumulation of disordered elastic fibers in the dermis of the skin.)

## Clinical Presentation:

- Patients suffering from solar elastosis will have THICKENED and YELLOW skin.
- (Deep wrinkles that do not disappear with stretching are also common.)

## Prevention:

- This disease is easily preventable by limiting sun exposure OR applying creams and other protective measures.

## Risks:

- This disease increases the risk of skin pre-malignancies (Actinic keratosis) AND increases the risk of skin malignancies such as: melanomas, Basal cell carcinomas, Squamous cell carcinomas.

### \*Important notes:

- The doctor said that the main differentiator between Solar elastosis and actinic keratosis is the presence of CELLULAR ATYPIA.

Solar elastosis = NO ATYPIA.

Actinic keratosis: ATYPIA must be present.

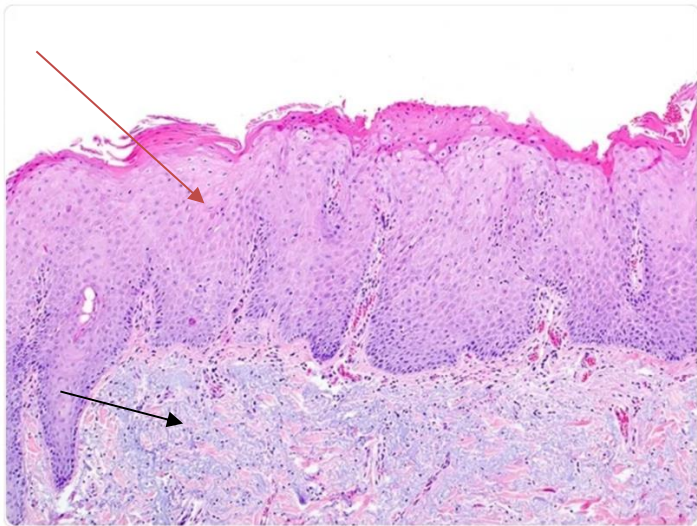
- Solar elastosis usually acts as a bed for other lesions. In other words, you will most likely find elements of solar elastosis in histological sections of other lesions/diseases.



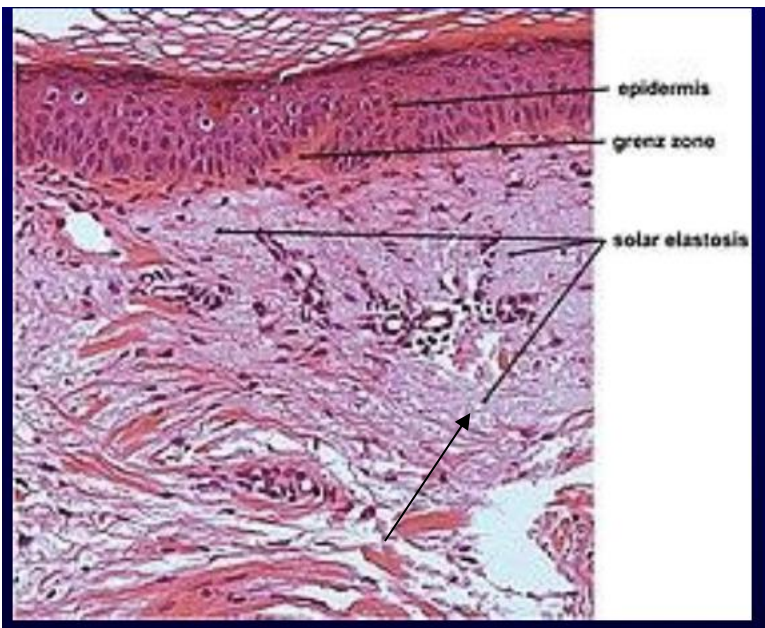
## Morphology:



→ Both pictures show thickened, yellowish skin with very deep wrinkle lines.



Look at the accumulation of the disordered elastic fibers in the dermis (black arrow) + the thickening of the epidermis (red arrow)



Same thing as the previous picture.  
Accumulation of disordered elastic fibers (black arrow,

# Actinic Keratosis:

## Etiology:

- Excessive sun UV ray exposure causes **multiple hits on different genes, causing DNA mutations, most commonly to TP53**. This disease is pre-malignant (refer to the morphology section to understand more.)

## Risks:

- There is a very low chance of actinic keratosis progressing to Squamous cell carcinoma (1-3% chance; **It is the most common**), **Basal cell carcinoma, or melanomas**.

## Clinical presentation: (From the book)

- Brown or red 'Sandpaper' like lesions that are usually <1 cm that are associated with Hyperkeratosis.
- Usually presents on areas that are predisposed to sun exposure (face, arms, and dorsum of the hands.)

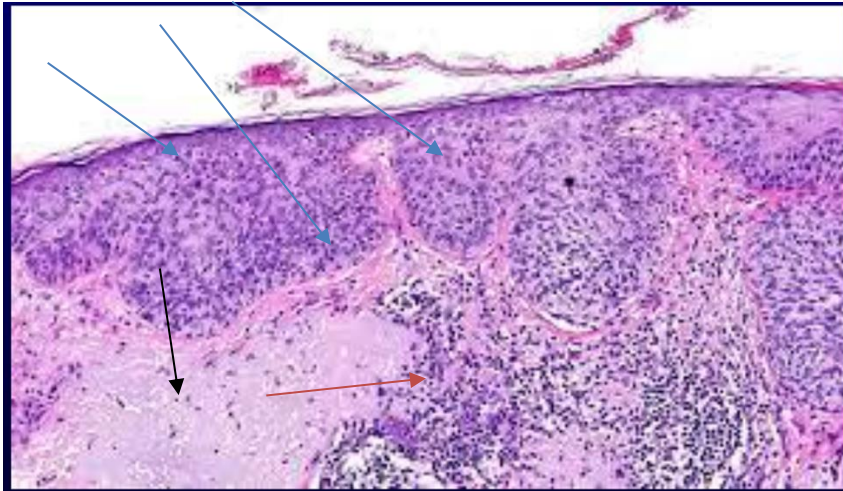
\*The pictures below show the sandpaper like appearance of the lesions.



## Morphology: (From the book)

- These lesions will usually show **cellular atypia** at the lower portions of the epidermis. It is associated with the hyperplasia of the basal cells. (This makes sense since the TP53 gene -Guardian of the genome- has been mutated.)
- **Loss of cellular maturation can be seen in the upper levels of the epidermis.**

→ We will also see disordered accumulation of elastic fibers in the dermis (indicative of solar elastosis which is a pre-cursor to Actinic keratosis.)



The blue arrow shows immature cells at the upper levels of the epidermis. (Immature meaning, they did not undergo proper keratinization.)

The red arrow shows interface dermatitis. (T-cell infiltrate that attacks the basilar epidermis.)

The black arrow shows Solar elastosis.

## Seborrheic Keratosis:

### Etiology:

- Mainly caused by acquired activating mutations in growth factor signaling mechanisms.
- The most common mutation occurs in the FGFR3 gene.

### Clinical presentation:

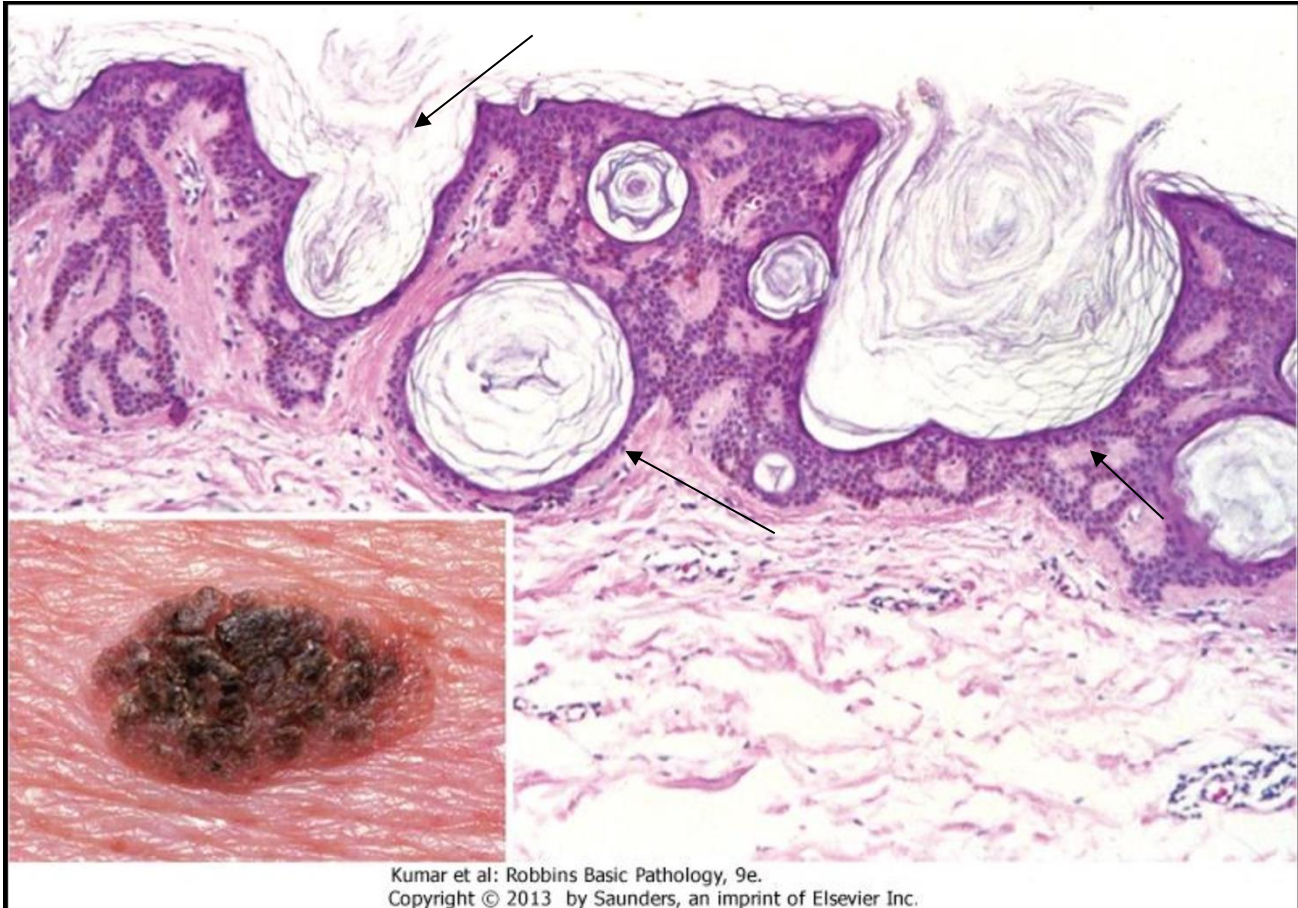
- Very common pigmented neoplasms. **It is a benign skin tumor.**
- They are much more common in middle aged to older patients.
- They can present anywhere on the body, but the trunk is the most common site of presentation.
- They are clinically insignificant, but we might take a biopsy to rule out malignancy.

### Morphology:

- **Coin-like lesions with intra-epidermal keratin filled cysts. They appear "Stuck on" to the skin.**



→ The presence of these lesions could indicate other tumors such as actinic keratosis, basal cell carcinoma, squamous cell carcinoma, or very rarely melanomas, BUT our number one differential should be seborrheic keratosis.



The black arrows point to the intra-epidermal keratin filled cysts.

**A Histological sample that shows irregular skin formation + intraepidermal cysts indicates seborrheic keratosis.**

The bottom left picture shows the pigmented lesion associated with seborrheic keratosis and possibly other diseases mentioned in the morphology section.



## Skin Cysts:

- Very common and almost all are benign (Skin bumps.)
- Often called sebaceous cysts by surgeons, but that is a misnomer as they are actually epidermal inclusion cysts.
- Malignant transformation is extremely rare.

## Types:

- Epidermal (Epithelial) Inclusion cysts: **Keratin filled cysts inside fully mature squamous epithelium with granular cell layer (Granulosum layer).**
- Dermoid cysts: **Another name for teratomas.**
- Trichilemmal cysts: **Benign tumors commonly found around the scalp.**

## Dermoid Cysts:

### Etiology:

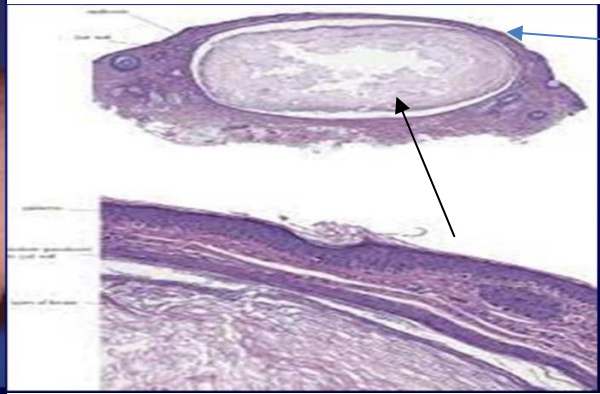
- They are abnormally located sacs filled with a greasy yellow material and other MATURE mesenchymal tissue such as: Bone, hair, muscle, teeth, cartilage, etc.
- **The most accepted theory is that a stem cell differentiates into other cells of mesenchymal origin.**

### Diagnosis:

- **Presence of fully mature tissue indicates a benign tumor.**
- Rarely, they can develop immature tissue or malignant elements.
- **Ovarian teratomas (dermoid cysts) are 90-95% benign, which means they have a 5-10% chance of being malignant. As such, if we ever get a sample of an ovarian teratoma we need to be very thorough with our examination and make sure we do not miss the presence of any immature mesenchymal tissue.** Usually, we look for immature neural tissue.
- **ALL teratomas found in the testes are malignant.**

### Clinical presentation:

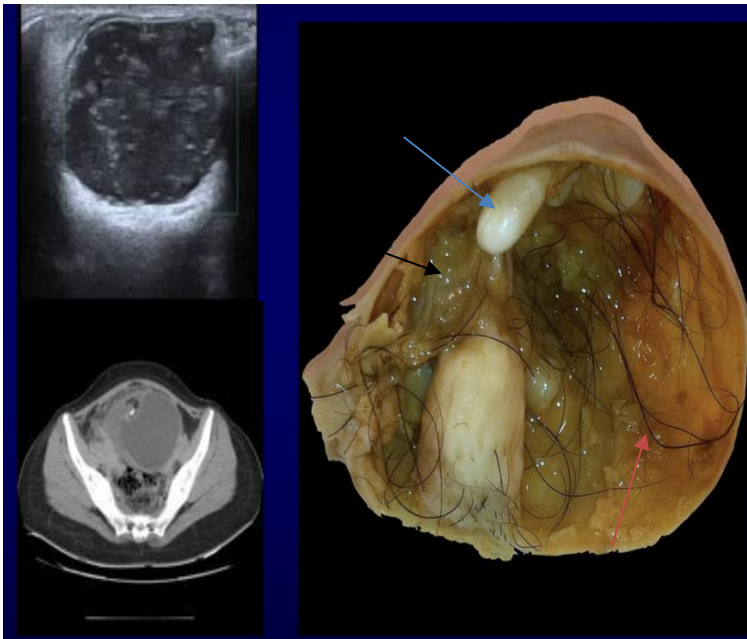
- They can be found anywhere on the body. Periorbital, ovarian, spinal...etc.



Picture on the left shows an Epidermal inclusion cyst.

The black arrow on the right picture is pointing to the keratin filled cyst.

The blue arrow is pointing to the fully mature squamous epithelium covering the keratin cyst.

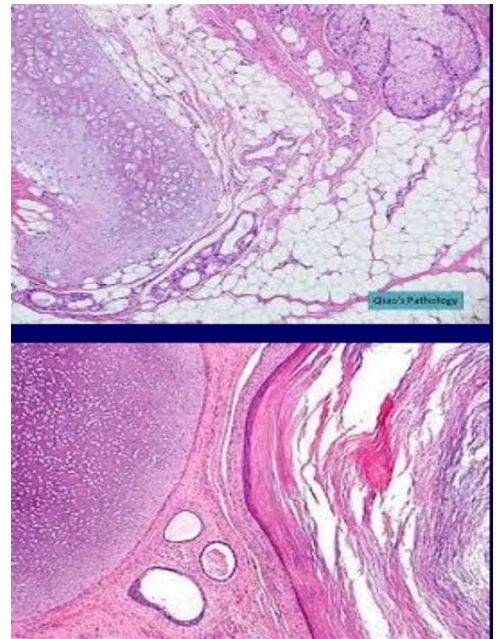


Black arrow: Greasy yellow material

Blue arrow: Teeth

Red arrow: Hair

The picture is of an ovarian dermoid cyst.



Perfect representation of how one dermoid cyst can have multiple types of fully mature mesenchymal tissue.

We can see cartilage, skin, adipocytes, and other tissue in one histological sample

# Squamous cell carcinoma:

**Etiology:** (What increases the risk of developing Squamous Cell carcinoma)

- Immunosuppression (HPV in cervical cancer cases), prolonged sun exposure, tars and oils, Old Burns (Squamous cell carcinoma that develops on top of old burns is called a Marjolin Ulcer), and Ionizing radiation.
- They are common neoplasms that happen due to sun damage.

**Clinical presentation:**

- They are commonly localized to the epidermis and dermis. Very rarely do they ever metastasize or infiltrate deep tissue layers.
- They are however invasive. (Do not get confused here, invasive means it will expand throughout the entirety of the epidermal and dermal layers. Infiltration means it will spread DEEPER into neighboring tissue such as the underlying fat and soft tissue layers.)
- Two types:
  - Keratinizing squamous cell carcinoma: Keratin differentiation is visible.
  - Non-keratinizing Squamous cell carcinoma: More dangerous than its keratinizing counterpart.

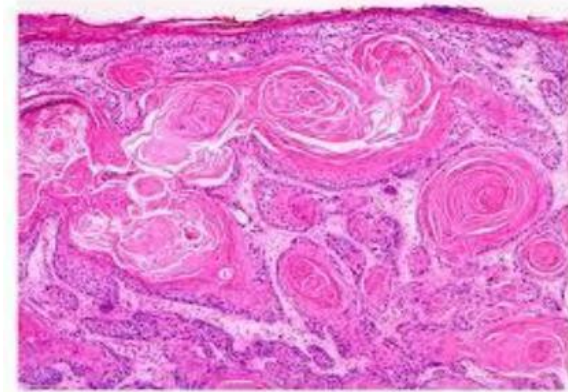
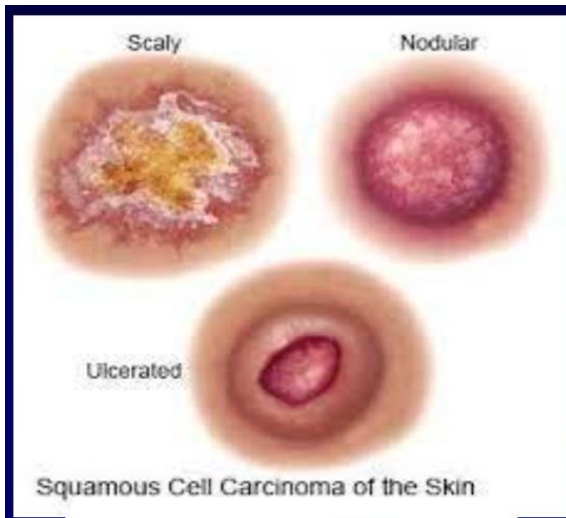
**Diagnostic Techniques:**

- Excisional Biopsy: It is when the surgeon excises the entire lesion without a prior diagnosis.
- Shave biopsy: When the dermatologist shaves off parts of the lesion for testing.
- Core needle biopsy: When the dermatologist biopsies the lesion by entering via a needle and taking a deep sample of the lesion. (<https://www.youtube.com/watch?v=QwvU0nqGxnU>.)

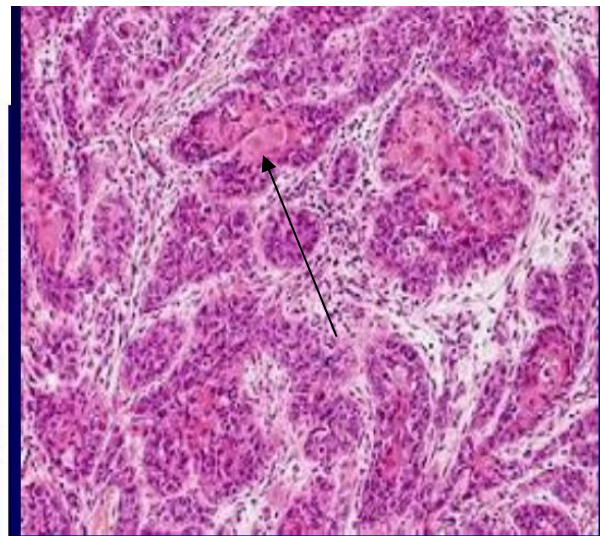
**Treatment:**

- Squamous cell carcinomas of the skin are often discovered when small and resectable (Surgical excision.)

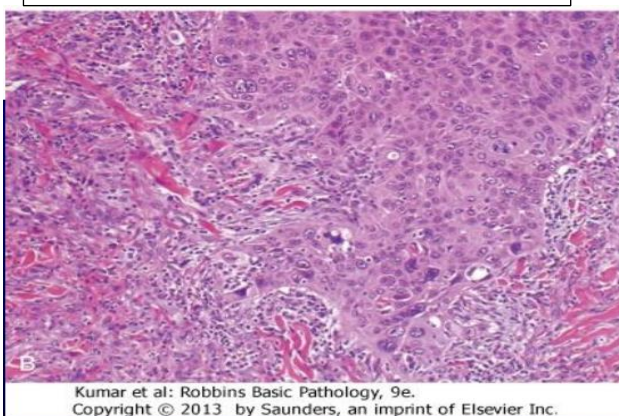




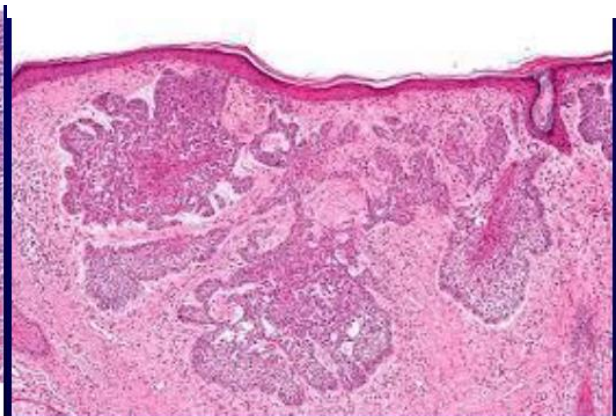
**GRADE 1. Well differentiated Keratinizing Squamous cell carcinoma. A LOT of keratin → A lot of epithelial maturation**



**GRADE 2. Moderately differentiated keratinizing squamous cell carcinoma. More cellular, but we can still see bits of keratin (black arrow)**



**GRADE 3. Poorly differentiated keratinizing squamous cell carcinoma.**



**Very invasive Squamous cell carcinoma. The doctor said that if a tumor is connected to the epithelium → Primary skin tumor.**

# Basal cell carcinoma:

## Etiology:

- Prolonged sun exposure that causes loss of function in tumor suppressor genes such as PTCH1 and TP53 that regulate cell division.
- Basal cell carcinoma arises from mutated Basal cells of the epidermis.
- **Most common tumor of the skin.**

## Clinical Presentation:

- Pearly papules often presented with prominent, dilated subepidermal blood vessels. Slight pigmentation.
- Localized Invasive tumor that RARELY infiltrates deeply or metastasizes.
- **It is less aggressive than squamous cell carcinoma.**

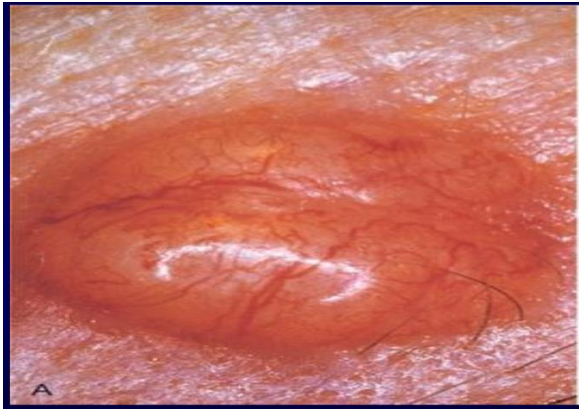
## Associated Syndromes:

- Gorlin syndrome: **Presence of multiple basal cell carcinomas that can sometimes be pigmented and be called Basal cell nevus syndrome.**

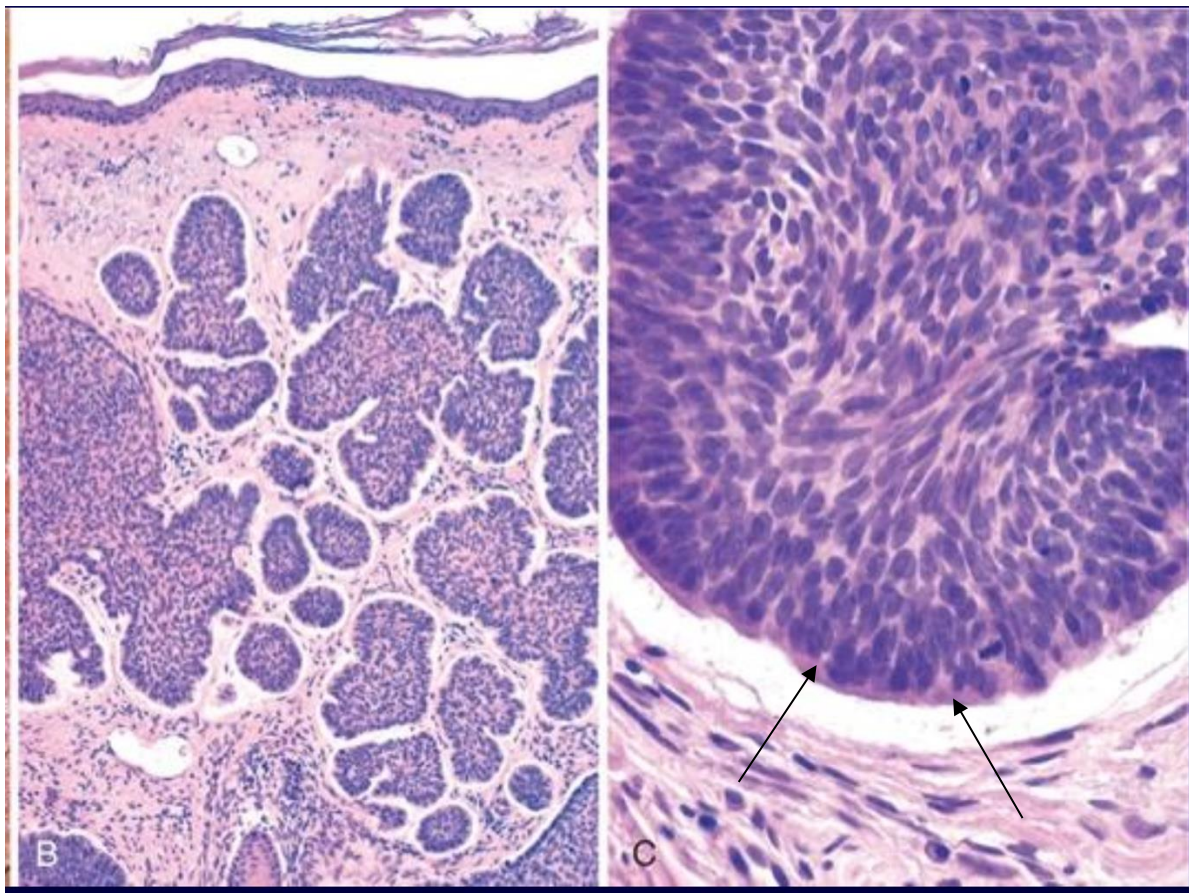
## Morphology:

- **Basal cells found deep inside the dermis with cellular atypia, high N/C ratio, and look more bluish.**
- **Sometimes differentiating between basal cell carcinoma and Squamous cell carcinoma is difficult so we call those tumors basosquamous or squamobasal tumors.**
- **The cell mutated in both squamous cell carcinoma and basal cell carcinoma is the keratinocyte. The only difference is where the mutated cell is found.**
- **They have a palisading pattern that is shown in the next page.**  
(Palisading pattern means that nuclei line the outer part of the tumor and separate it from the stroma. The doctor described it as soldiers defending the front lines.)





Pearly papule with prominent, dilated subepidermal blood vessels.



Picture on the left shows multiple basal cell tumors invading the underlying dermis. They show cellular atypia and a more bluish color.

The black arrows on the right show the palisading pattern of basal cell carcinoma. Look at how the nuclei is forming a line that separates the tumor from the stroma.



<p>وكيف ذلك ؟</p> <p>﴿ لَا تَدْرِي لَعَلَّ اللَّهَ يُخْدِثُ بَعْدَ ذَلِكَ أَمْرًا ﴾</p>	<p>_ إنه صعب يا الله !</p> <p>﴿ إِنَّهُمْ يَرَوْنَهُ بَعِيدًا وَنَرَاهُ قَرِيبًا ﴾</p>
<p>_ إذا قلت لقد تعبت ؟</p> <p>﴿ وَاصْبِرْ لِحُكْمِ رَبِّكَ فَإِنَّكَ بِأَعْيُنِنَا ﴾</p>	<p>_ لا أستطيع التحمل !</p> <p>﴿ لَا يَكْلَفُ اللَّهُ نَفْسًا إِلَّا وُسْعَهَا ﴾</p>

GOOD LUCK!