Malignancy Type	Follicular Adenoma	Follicular Carcinoma	Papillary Carcinoma	Medullary Carcinoma	Anaplastic Carcinoma	Lymphoma
Defining features ( <u>Not</u> <u>histology</u> )	Mostly non-functional. Less commonly, may secret thyroid hormones.	Common in iodine deficient regions Can present with Multiple lung nodules	MOST COMMON type of thyroid carcinoma.  Exposure to radiation in childhood. (Major RF)  Can arise from Hashimoto thyroiditis. Thyroid nodule with lymph node enlargement.	↑ calcitonin → Hypocalcemia Younger patients than other malignancie s	Often invades local structures → Dysphagia or respiratory compromise Rapidly enlarging mass in the neck.	Can arise from Hashimoto thyroiditis.
Demography	Women>Men	Women> Men 40-60 years	Women>Men	Women> Men. Sporadic cases 50-60y Familial cases Younger groups	Women> Men  - Mostly affects the elderly of >65 years.  25% have Hx of previous well- differentiate d thyroid Carcinoma.	Women>Men
Metastasis		Hematogen ously (Blood and bone → Bonophilic)	To cervical lymph nodes (Neck)			
Sporadic/ Familial				Can be sporadic or familial. If older likely sporadic, younger likely familial.		

Mutation type	1- Driver mutation in TSH stimulation. 2- Rarely, RAS mutation.	RAS	RET/PTC	Familial cases: MEN-2A/2B Associated with mutations in RET	RAS	
Mortality, Prognosi.		More aggressive than papillary carcinoma 50% of patients die within 10 years.	Relatively indolent NotAggressive 10-year survival > 95% EVEN with lymph node metastasis.		VERY AGGRESSIVE 100% mortality rate in less than a year! VERY BAD PROGNOSIS	
Malignancy Type	Follicular Adenoma	Follicular Carcinoma	Papillary Carcinoma	Medullary Carcinoma	Anaplastic Carcinoma	Lymphoma
Defining features (ONLY HISTOLOGY	Solitary, well- circumscribed with1- Intact Capsule (No vascular of capsular invasions, thus, differing them from Follicular carcinoma) 2- Thickened capsule. (Thus, differing them from hyperplastic nodules.)	Similar to follicular adenoma  EXCEPT:  1- The tumor is mushrooming or have a mushroom-like capsular invasion.  2- The tumor is too close to the	Compromised of papillae line by (crowding or cells with:  1- Empty-appearing nucle with central clearing and white "Orphan Annie eye" nuclei.	Calcitonin often deposit within the tumor as amyloid appearing in light pinkis And the cancer's cells look dark blue are called	Have very ugly bizarre looking anaplastic cells No amyloid, no papillae no follicles, no meaningful structures.	

the capsule or

outside of it.)

bodies

(Spherical

calcified foci

with **concentric** 

**Very specific for** 

laminations -

PTC, almost a

necrosis,

-- Often

hemorrhage.

mistook for

an abscess

for the heavy

presence of

of benign

adenoma)

## Pseudo nuclear inclusions (The invagination of cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO))  ## ## ## ## ## ## ## ## ## ## ## ## ##							
metaplasia of cells that line follicles \$\rightarrow\$ Hurthle cells (Also seen in Hashimoto thyroidits)		Eosinophilic		characteristic. it		neutrophils.	
Inne folicides → Hurthle cells (Also seen in Hashimoto thyroiditis).						-	
cells (Also seen in Hashimoto thyroiditis)				other diseases like		_	
Hashimoto thyroiditis).				meningioma)			
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Vyclologic examination  Cyclologic examination  Cyclologic examination  (Tissue biopsy)  FNA? (Fine needle aspiration Dx)  Cyclologic examination  Cyclologic examination  (Tissue biopsy)  FNA? (Fine needle aspiration Dx)  PsamMoma bodies (Moma and Papi adopted orphan annie)  3- Nuclear grooves  (It only sees the appearance of intranuclear inclusions (PSEUDO))  Yes — Easily & Accurately (Preoperatively)  Accurately (Preoperatively)  #*Detected in histology and cytology.				30.7		1000000	
PINKISH & Granular.							
FNA? (Fine needle aspiration Dx)  Dx  W  Histological examinations (Tissue biopsy)  Cytologic examination  Cytologic examination  Tissue biopsy)  FNA? (Fine needle aspiration of cytoplasm of the capsule)  Pseudo nuclear inclusions (The invagination of cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO))  W  Yes — Easily & Accurately (Preoperatively)  Accurately (Preoperatively)  #*Nuclear grooves  Yes Yes Yes Yes Accurately (Preoperatively)  ##Nuclear grooves  ##Detected in histology and cytology.				S1816.01 C			
##Detected ## proof of the capsule.)  FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Cytologic examination  Tissue biopsy)  Cytologic examination  Tissue biopsy)  A-Pseudo nuclear inclusions (The invagination of cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO))  Yes — Easily & Accurately (Preoperatively)  Yes — Ye				bodies (Moma and Papi adopted orphan			
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Cytologic examination  Groves  A-Pseudo nuclear inclusions (The invagination of cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO))  Wes - Easily & Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Cytolplasm often gives the follicular cells, and not the capsule.)  Histological examinations (Tissue biopsy)  Cytologic examination  Cytologic examination  Yes — Easily & Accurately (Preoperatively)  Accurately (Preoperatively)  #+Nuclear features are of utmost in histology and cytology.  ## of the invagination of cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO) )  ## Need							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Pseudo nuclear inclusions (The invagination of cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO) )  Ves — Easily & Accurately (Preoperatively)  Pesudo nuclear inclusions (The invagination of cytoplasm of the appearance of intranuclear inclusions (PSEUDO) )  Ves — Easily & Accurately (Preoperatively)  Pres — Fasily & Accurately (Preoperatively)  Pseudo nuclear inclusions (Tessue appearance of intranuclear inclusions (PSEUDO) )  Ves — Easily & Accurately (Preoperatively)  Pseudo nuclear inclusions (Pseudo inclusions (PSEUDO) )  Ves — Easily & Accurately (Preoperatively)  Pseudo nuclear inclusions (Pseudo inclusions (PSEUDO) )  Ves — Easily & Accurately (Preoperatively)  Pseudo nuclear inclusions (Pseudo inclusions (PSEUDO) )  Ves — Easily & Accurately (Preoperatively)  Pseudo nuclear inclusions (Pseudo inclu							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO))  Yes — Easily & Accurately (Preoperatively)  Accurately (Preoperatively)  #+Nuclear features are of utmost ining using different  inclusions (The invagination of cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO))  Yes — Easily & Accurately (Preoperatively)  #+Nuclear features are of utmost ining using different  #+Detected in histology and cytology. different				-			
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Cytologic examination  Invagination of cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO) )  Yes — Easily & Accurately (Preoperatively)  Yes — Y							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO) )  Yes — Easily & Yes Yes Yes Yes Accurately (Preoperatively)  #+Nuclear features are of utmost in histology and cytology. Cytologic examination  Cytoplasm often gives the appearance of intranuclear inclusions (PSEUDO) )  Yes — Easily & Yes Yes Yes Yes Yes Accurately (Preoperatively)  #+Nuclear features are of utmost in histology and cytology. different							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Cytologic examination  RNA? (Fine needle aspiration Dx)  Cytologic examination  RNO  (It only sees the follicular cells, and not the capsule.)  Pyes  Yes  Yes  Yes  Yes  Yes  Yes  Yes							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy) Cytologic examination  Cytologic examination  Another capsule intranuclear inclusions (PSEUDO) (PSEUDO) (PSEUDO) (PSEUDO) (PSEUDO) (Pseudon inclusions (PSEUDO) (Pseudon							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination    Intranuclear inclusions (PSEUDO)				_			
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination    inclusions (PSEUDO)							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  (PSEUDO) )  Yes - Easily & Yes Yes Yes Yes Yes Yes Yes Accurately (Preoperatively)  Yes - Easily & Accurately (Preoperatively)  Yes - Easily & Yes							
FNA? (Fine needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  Cytologic examination  Cytologic examination  Yes — Easily & Yes  Yes  Yes  Yes  Yes  Yes  Yes  Yes							
needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  (It only sees the follicular cells, and not the capsule.)  Accurately (Preoperatively)  #+Nuclear features are of utmost ning using and cytology.  importance.  Accurately (Preoperatively)  #+Detected #  in histology and cytology.				(235000))			
needle aspiration Dx)  Dx  Histological examinations (Tissue biopsy)  Cytologic examination  (It only sees the follicular cells, and not the capsule.)  Accurately (Preoperatively)  #+Nuclear features are of utmost ning using and cytology.  importance.  Accurately (Preoperatively)  #+Detected #  in histology and cytology.							
Cytologic examination   Collicular cells, and not the capsule.)   Cytologic examination   Collicular cells, and not the capsule.)   Cytologic examination   Cytologic examin	FNA? (Fine	Yes	No	Yes – Easily &	Yes	Yes	Yes
Dx)  Histological examinations (Tissue biopsy)  Cytologic examination  not the capsule.)  Histological examinations (Tissue biopsy)  (Tissue biopsy)  not the capsule.)  Histological examinations features are of utmost importance.  importance.  #+Detected in histology and cytology.	needle		(It only sees the	Accurately			
examinations (Tissue biopsy)examinations (Tissue biopsy)features are of utmost importance.Immunostai ning using differentin histology 				(Preoperatively)			
biopsy) (Tissue biopsy) utmost ning using and cytology.  Cytologic examination importance.	Dx	Histological	Histological	#+Nuclear	1-		#
Cytologic examination importance. different				features are of			
			(Tissue biopsy)	utmost		and cytology.	
is inaccurate. Here, we don't stains for		Cytologic examination		importance.			
		is inaccurate.		Here, we don't	stains for		

	Cytologic	aim for a	1-Calcitonin	
	examination is	capsule.		
	inaccurate.		2- TTF-1	
			(Stains both	
	It's still		lungs and	
	difficult to reach		thyroid.)	
	a definitive Dx			
	and such cases		3-	
	are termed		Thyroglobul	
	minimal		in (Specific	
	deviation		for thyroid)	
	follicular			
			4- Amyloid	
			(Congo red	
			stain, under	
			polarizing	
			microscope,	
			the amyloid	
			looks green)	
Tx	 Thyroidectomy		RET +ve	 
	or a lobectomy.		family	
			members	
			require	
			<u>prophylactic</u>	
			<u>thyroidecto</u>	
			<u>my.</u>	