Wondershare EdrawMind

THYROID NEOPLASMS

- Thyroid tumors range from circumscribed, benign adenomas to highly aggressive, anaplastic carcinomas.
- **Fortunately , the overwhelming majority of solitary nodules of the thyroid prove to be either:**
  - benign adenomas.
  - localized , non neoplastic conditions , e.g:
    - 1-dominant nodule in multinodular goiter.
    - 2-simple cysts.
    - 3-foci of thyroiditis.
- **Benign vs malignant**
  - Thyroid nodule most likely to be **malignant** if:
    - Solitary.
    - Nodules in younger patients
    - Nodules in males
    - Nodules that doesn't take up radioactive iodine in imaging studies (cold nodules)
- **Neoplastic thyroid lesions**
  - Benign
    - follicular adenoma
      - -Adenomas of the thyroid are benign neoplasms derived from follicular epithelium.
        -Follicular adenomas usually are solitary, DDX??
        -the vast majority of adenomas are nonfunctional, a small proportion produce thyroid hormones (toxic adenomas), causing clinically apparent thyrotoxicosis.
      - Morphology
        - Solitary, encapsulated, variable size (1 -10 cm)
      - Histology
        - -Closely packed follicles.
          -Completely enveloped by thin fibrous capsule
          -surrounding thyroid tissue shows signs of compression.
      - Treatment
        - -Lobectomy (not enucleation
          -Carry an excellent prognosis do not recur or metastasize.
  - Malignant
    - Thyroid carcinoma
      - -1% of all cancer in U.S., 0.2% of all cancer deaths.
        -Increasing incidence due to new diagnostic practices which detect smaller tumors. * cause compression on trachea or esophagus which may lead to dysphagia or harsh voice
        -20 year survival is 90%, because most are indolent papillary carcinomas
        -A female predominance has been noted among patients who develop thyroid carcinoma in the early and middle adult years (Often estrogen receptor positive).
      - types
        - Papillary carcinoma
          - (accounting for more than 85% of cases)
            -The most common types of thyroid carcinoma.
            -Female predominance; F:M ratio = ~3:1
            -Median age of diagnosis in 50s
            -Ionizing radiation is the best established risk factor.
          - Mainly 2 genes are involved:
            - 1. BRAF amplification.
            - 2. RET gene rearrangment
          - Clinical features:
            - -Presented as Painless palpable thyroid mass.
              -The diagnosis is first rendered on ultrasound guided pre operative fine needle aspiration cytology
              -Surgical pathology report of a resected specimen provides further information about the subtyping (i.e., variant) and microstaging
              -Commonly treated with surgical resection.
          - Morphology
            - Solid or cystic mass with papillary projections
          - Histology.
            - Defined by two cardinal features:
              -true papillae with a fibrovascular core.
              -nuclear features of papillary carcinoma.
            - nucleus
              - -irregular nuclear contour.
                -nuclear groove.
                -nuclear pseudoinclusion
        - Follicular carcinoma
          - -Thyroid carcinoma with follicular differentiation but no papillary nuclear feature.
            -Follicular lesion with capsular or vascular invasion but without papillary nuclear features.
            -More common in women and in areas with dietary iodine deficiency .
            -The peak incidence between the ages of 40 and 60 years.
          - GENETIC FACTORS:
            - Gain of function point mutations of RAS and PIK3CA.
            - Loss of function mutations of PTEN.
          - Two types
            - 1. Minimally invasive follicular carcinoma
              - -With capsular invasion
                -With vascular invasion
            - 2. Widely invasive.
          - Clinical features
            - -Usually "cold" on radionuclide scan
              -Does not metastasize through lymphatics but does spread to lungs, liver, bone, brain via blood vessels
              -Less than 5% with ipsilateral lymphadenopathy.
          - Treatment:
            - -thyroidectomy and radioactive iodine
              -No nodal dissection is needed
          - Morphology
            - -Tan to brown solid cut surface, can have cystic changes and hemorrhage
              -Minimally invasive: usually single encapsulated nodule, with thickened and irregular capsule
              -Widely invasive: extensive permeation of capsule or no capsule.
          - Histology
            - -solid pattern of follicles (small, normal sized or large).
              -No nuclear features of papillary thyroid carcinoma
              -Invasion of adjacent thyroid parenchyma, capsule (complete penetration) or blood vessels (in or beyond the capsule)
        - Anaplastic (undifferentiated) carcinoma
          - -A highly aggressive thyroid malignancy composed of undifferentiated follicular thyroid cells, devoid of morphologic features of thyroid origin.
            -Medium age 60- 70 years with incidence to rise with age, F:M = 2:1.
            -Higher incidence in areas of dietary iodine deficiency.
          - GENETIC FACTORS:
            - Inactivation of TP53.
          - Clinical features
            - -Rapidly enlarging, bulky neck mass invades adjacent structures causing hoarseness, dysphagia, dyspnea.
              -fixed to the underlying structures.
              -Extrathyroidal extension in majority of cases
              -Regional nodal metastases and vocal cord paralysis present in up to 40% and 30%, respectively
          - Treatment
            - Radiation therapy, surgery when feasible or chemoradiation either concurrently or sequentially
          - Morphology
            - Bulky solid mass (mean: 6 cm) with zones of necrosis or variegated appearance.
          - Histology
            - Common features include:
              -widely invasive growth.
              -extensive tumor necrosis.
              -marked nuclear pleomorphism
              -high mitotic activity
        - Medullary carcinoma
          - Neuroendocrine tumor derived from C cells (formerly called parafollicular cells), which secrete calcitonin
            -1 -2% of thyroid carcinomas
          - types
            - Either sporadic (nonhereditary)
              - 70%, age 40 -60, solitary
            - familial (hereditary)
              - -30%, younger patients (mean age 35
                -Occurring in the setting of MEN syndrome 2A or 2B,
                -familial medullary thyroid carcinoma without an associated MEN syndrome
          - Clinical features
            - -Presents with painless thyroid mass, cold on scanning
              -Up to 75% of patients have nodal metastasis.
              -Serum calcitonin correlates with tumor burden
              -Patients with metastasis may have severe diarrhea and flushing
              -Some tumors may produce ACTH or CRH (Cushing syndrome
          - Morphology
            - Sporadic : typically presents as a single circumscribed but nonencapsulated , gray tan mass
            - Familial : generally bilateral / multiple foci.
          - Histology
            - Round.
              Plasmacytoid.
              polygonal
              spindle cells.
              - in
                - nests.
                  Cords
                  follicles
            - -Eosinophilic to amphophilic granular cytoplasm due to secretory granules
              -Stroma has amyloid deposits from calcitonin