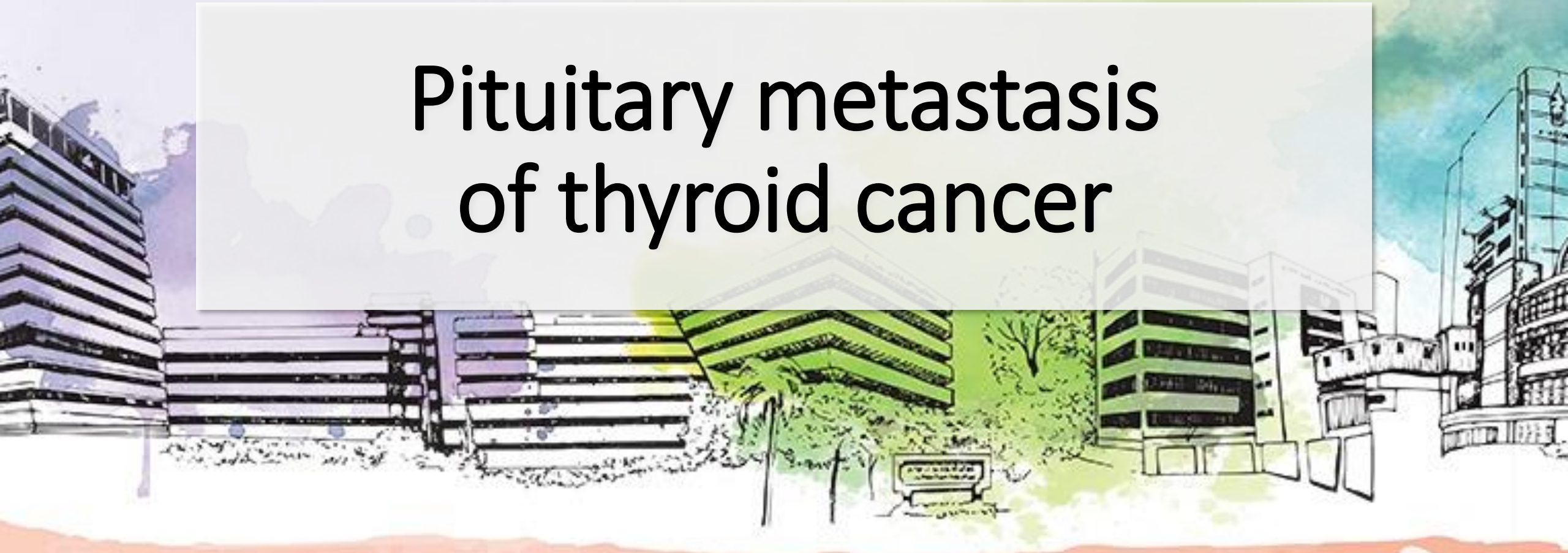


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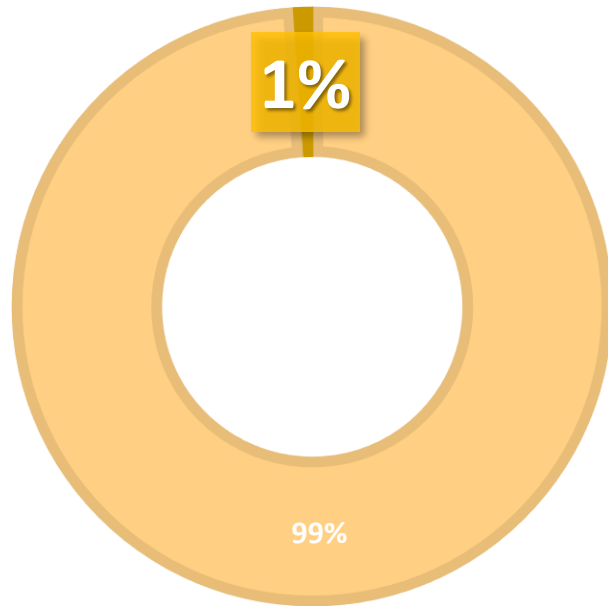
Pituitary metastasis of thyroid cancer



Epidemiology (1)

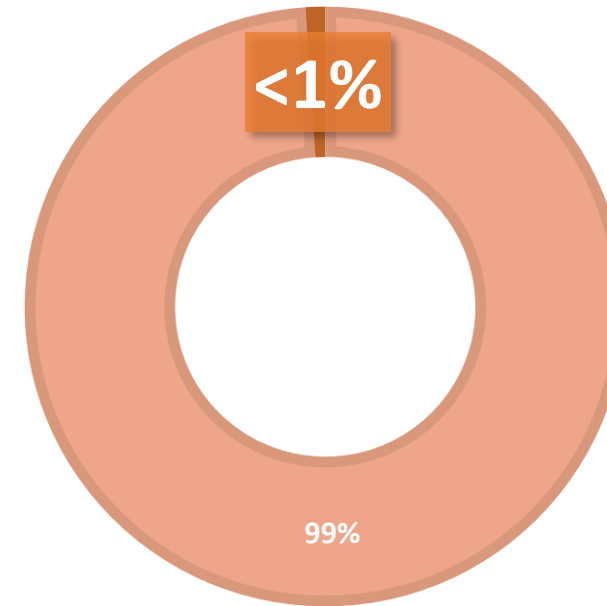
OPERATED PITUITARY MASSESS

■ Other sellar masses ■ Pituitary metastases (PM)



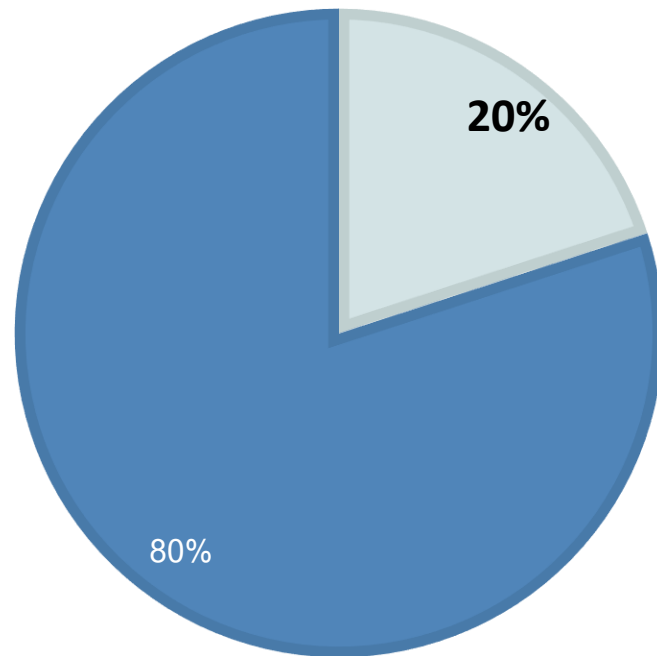
INTRACRANIAL METASTATIC LESIONS

■ Other sites ■ Pituitary



Epidemiology (2)

PATIENTS WITH PITUITARY METASTASIS

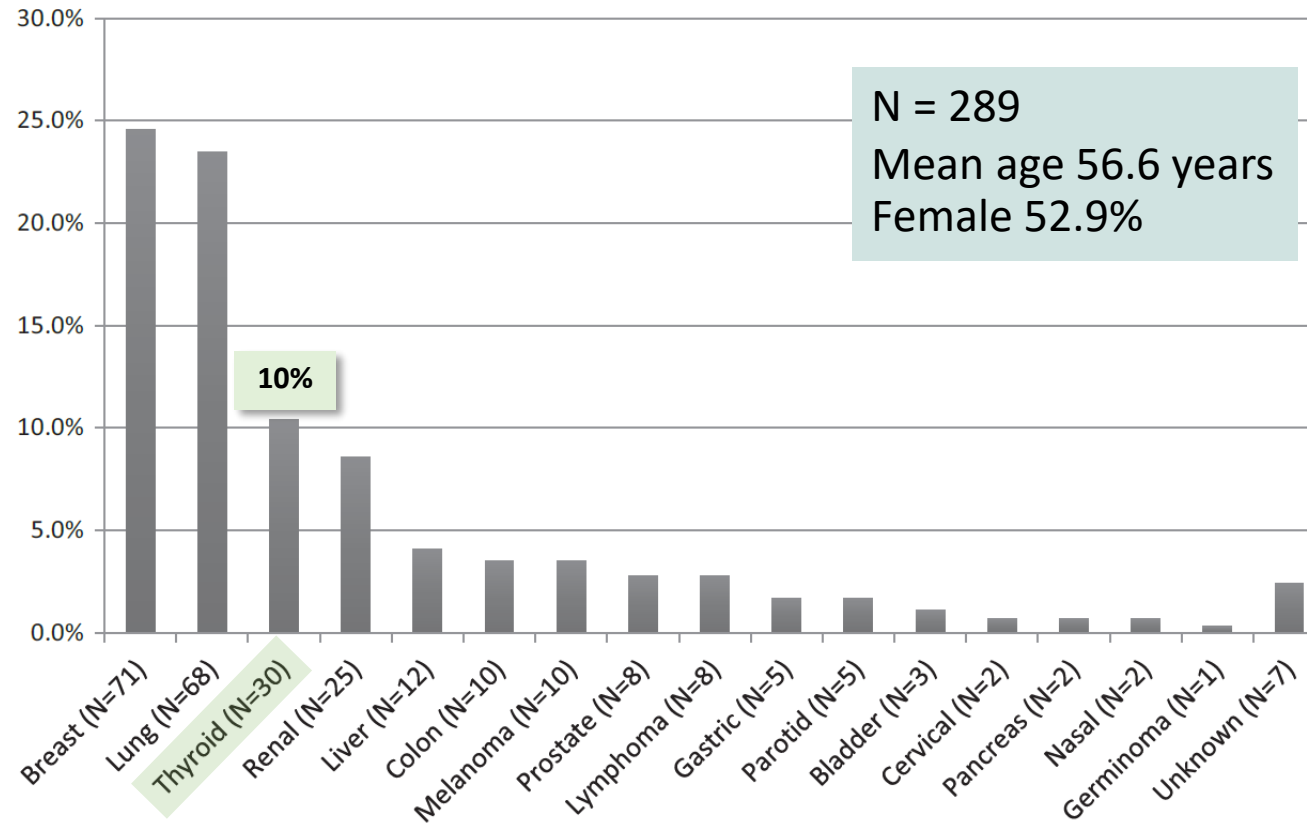


Diagnosed as the **initial presentation** of an unknown primary tumor and precedes the diagnosis of malignancy

Diagnosed as a **complication** of disseminated malignancies with metastatic spread to other organs

Epidemiology (3)

Frequencies of the pituitary metastasis **primary sites** reported in the literature from 1957 to 2018



Clinical presentation

PM from all other cancers¹

- Diabetes insipidus (~50%)
- Visual damage (30%)
- Ophthalmoplegia (25%)
- Headache/retroorbital pain (20%)
- Fatigue, weight loss, nausea/vomiting, and cognitive deterioration (5–10%)

PM from thyroid cancer²

- **Parasellar mass effect** > DI

Hypothesis:

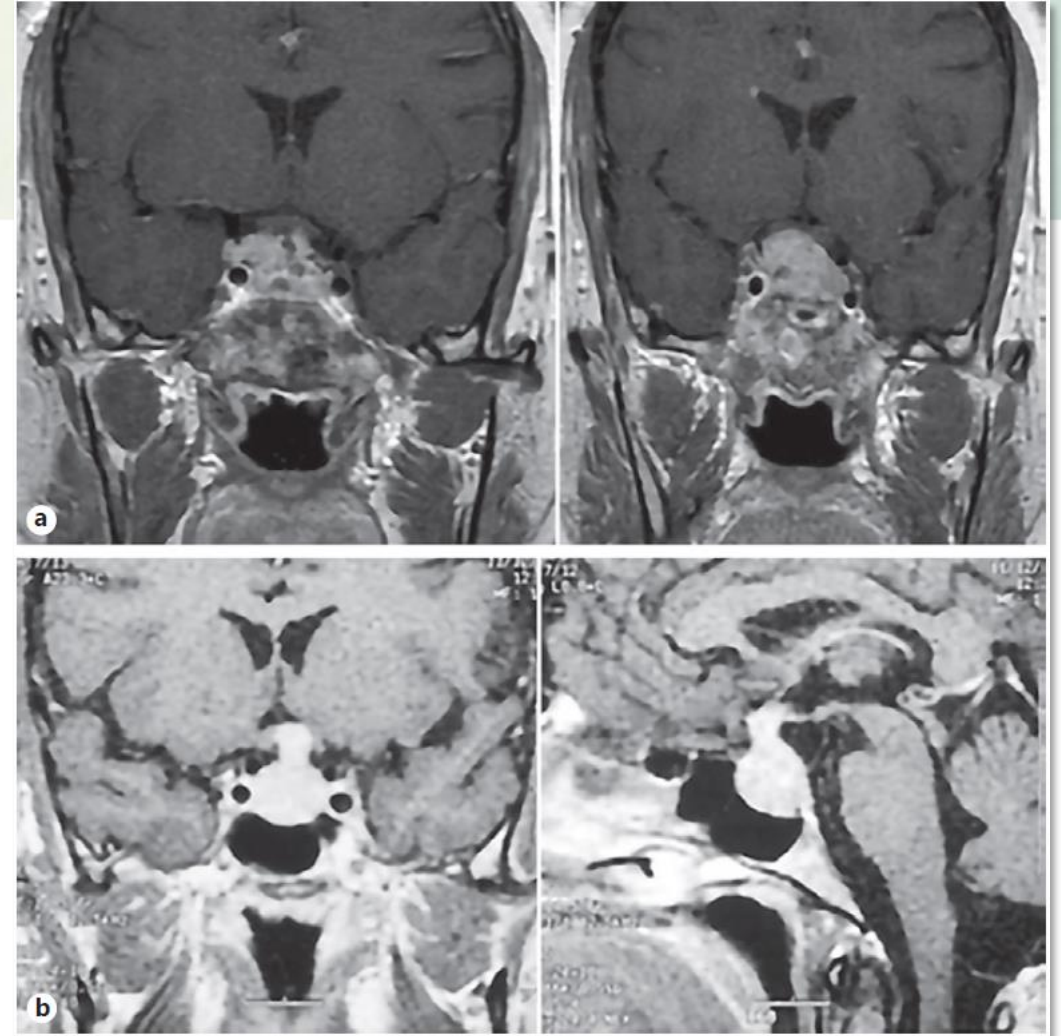
PM from thyroid carcinoma tends to initially exhibit a higher parasellar growth in relation to the intrasellar growth

1. Shimon I. Neuroendocrinology. 2020;110(9-10):805-808.

2. Barbaro D, et al. Endocrine. 2013 Jun;43(3):485-93.

Pituitary MRI

- **Nonspecific**
- **Suggestive findings of PM**
 - Non-homogenous invasive sellar mass
 - Dumbbell-shaped intrasellar and extrasellar tumor (due to indentation of the diaphragma sellae)
 - Loss of the posterior lobe bright spot
 - Sellar bone erosion without sellar enlargement



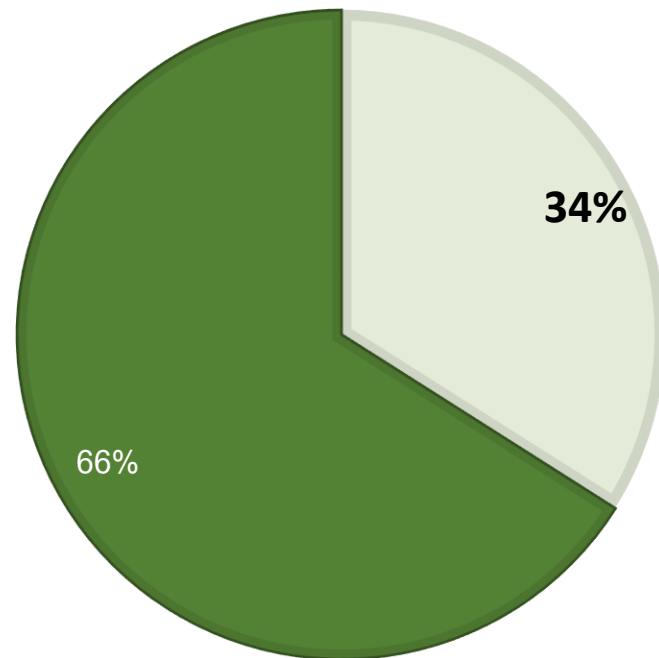
- a) Metastatic breast carcinoma presenting with headache, right optic neuropathy, diabetes insipidus, and hypopituitarism
- b) Metastatic atypical bronchial carcinoid presenting with bitemporal hemianopsia and hypopituitarism

Histopathology and mechanisms of metastasis

- **Hematogenous metastasis**
 - Widely invasive follicular carcinoma
 - Some variants of papillary carcinoma
 - Solid variants
 - The presence of vascular embolization or a history of metastatic disease to lung or bones
 - Medullary carcinoma
- **Direct invasion from skull base metastasis**
 - Follicular carcinoma

Diagnosis

PATIENTS WITH PITUITARY METASTASIS



Histological investigation

Sellar imaging combined with the appropriate clinical scenario and symptoms

Treatment of DTC with brain metastasis

Mainstays of therapy

Surgical resection

- If the metastases are large and locally invasive, surgical clearance may be difficult

Stereotactic external beam radiotherapy (SRT)

- In view of proximity to the optic chiasm as well as cranial nerves of the cavernous sinus, external beam radiotherapy could be difficult to plan

Considered

Radioactive iodine (RAI)

- If CNS metastases concentrate RAI (uptake rate of brain metastasis ranges only from 17% to 23%)
- SRT and concomitant GC therapy are recommended prior to RAI therapy to minimize the effects of a potential TSH-induced increase in tumor size and RAI-induced inflammatory response

(Weak recommendation, Low-quality evidence)

Treatment of DTC with brain metastasis

Isolated brain metastasis

Surgical resection OR

**External beam radiotherapy (EBRT),
including SRT**

- May provide local control and improve the QoL
- However, patients usually succumb from progressive systemic disease within a short time after the diagnosis of CNS metastases

(Grade C Recommendation)

Multiple brain metastasis

Whole-brain EBRT

Prognosis

- **Poor prognosis**

- Average survival < 2 years
- Despite aggressive therapy
- Even in patients without other metastasis in the initial assessment
- Single metastasis
 - tend to have a better outcome
- Advanced age at diagnosis
 - decreases survival

- **Cause of death**

- Progression of the primary tumor
- Extracranial metastatic lesion
- Extra-pituitary intracranial metastatic lesions
- Worsening of the pituitary lesion

Take home messages

Pituitary metastasis from thyroid cancer

- Uncommon
- Tends to present with symptoms related to parasellar mass effect
- Therapy
 - DTC: Sx + SRT ± RAI (after SRT and concomitant GC)
 - MTC: Single brain metastasis → Sx or EBRT (or SRT)
Multiple brain metastasis → Whole-brain EBRT
- Poor prognosis

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Thank you

