



THE 7<sup>TH</sup> ASIAN NEURO-OPHTHALMOLOGY SOCIETY CONGRESS 27-29 SEPTEMBER 2013



CERTIFICATE  
OF

ATTENDANCE

THIS IS TO CERTIFY THAT

**M. HIDAYAT, MD**

HAS ATTENDED THE 7<sup>TH</sup> ASIAN NEURO-OPHTHALMOLOGY SOCIETY CONGRESS AS

**SPEAKER**

**Muhammad Sidik, MD**

Chairman

**Masato Wakakura**

President of Asian Neuro-Ophthalmology Society

## Young Man with Pituitary Adenoma

**M. Hidayat, MD**  
Faculty of Medicine, Andalas University/  
M. Djamil Hospital

## Introduction

The pituitary gland, or hypophysis, is an endocrine gland which produce a number of hormones which control the secretions of many other endocrine glands

Its anatomical position is important in ophthalmological view

## Development

The anterior pituitary (adenohypophysis) arises from Rathke's pouch, an upward growth from the ectodermal roof of the stomodeum

The posterior pituitary (neurohypophysis) arises from a downward growth from the floor of the diencephalon



## Anatomy

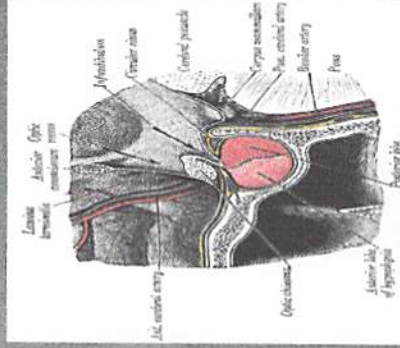
Occupies a cavity of the sphenoid bone called sella turcica at the middle cranial fossa

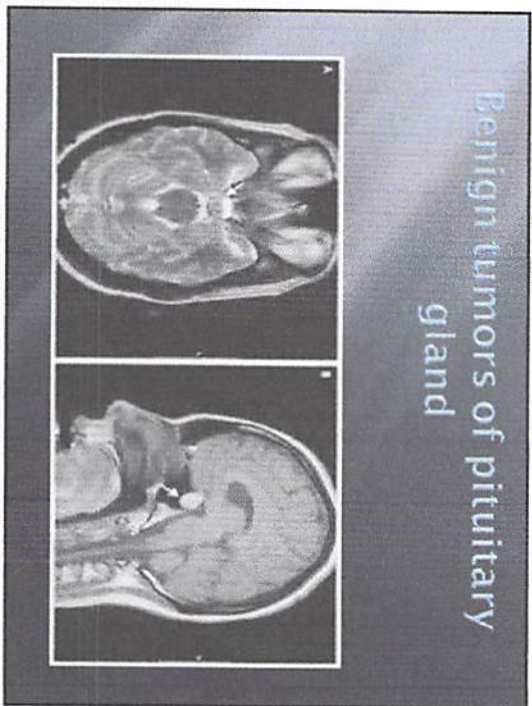
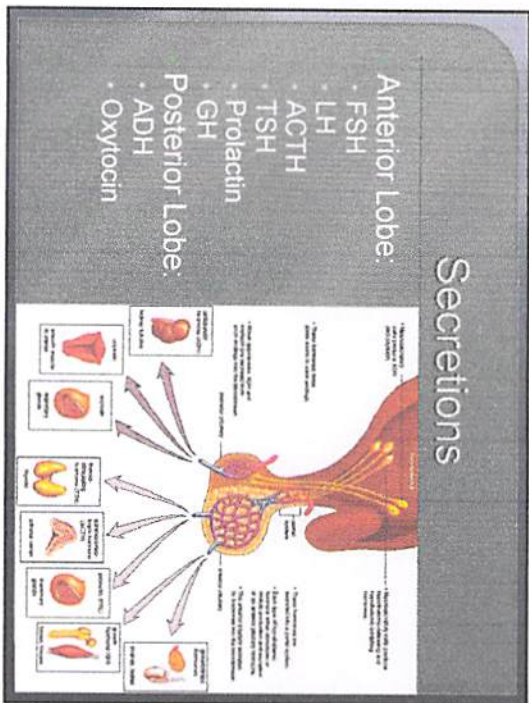
Roof is formed by diaphragma sellae

The stalk of pituitary is attached above to the floor of third ventricle

Size of a pea (< 8 mm)

It weighs about 0.5 gm.





Pituitary		Endocrine Gland	Hormone	Function	Secretion control is made by
Posterior	ADH	ADH	Stimulates reabsorption of water, increasing its permeability at distal convoluted tubules and collecting ducts of the nephrons	.....	.....
	Oxytocin	Oxytocin	Stimulates uterine contractions during parturition and promotes milk ejection reflex in the mammary glands	.....	.....
Anterior	GH	GH	Stimulates liver to produce growth factors that stimulate bone and cartilage growth	GHRH (Growth hormone releasing hormone)	.....
	ACTH	ACTH	Stimulates anterior pituitary growth and cell production	.....	.....
	FSH	FSH	Stimulates external testes to produce hormones (androstenediol and testosterone)	GnRH (Gonadotropin releasing hormone)	.....
	LH	LH	Stimulates development of ovaries	GnRH (Gonadotropin releasing hormone)	.....
	CSH	CSH	Stimulates testosterone production by the interstitial cells of the testes	.....	.....
	TSH	TSH	Stimulates thyroid gland to produce hormones (T3, T4, calcitonin)	TRH (Thyrotropin releasing hormone)	.....
.....	.....	.....	.....	.....	.....

### Epidemiology

Etiology is unknown

10-15% of all primary brain tumors

75% of adenomas are endocrinologically secreting

25% of those with MEN-1 develop pituitary adenomas

### Classification

Hormones		Clinical features	
Secretory (75%)	Chromophobe s (50%)	Prolactin	Female: Infertility, amenorrhoea, galactorrhoea Male: Hypogonadism, impotency, sterility, libido, gynaecomastia, galactorrhoea
	Acidophils (20%)	GH	Acromegaly/adult Gigantism (child)
	Basophils (5%)	ACTH, FSH & TSH	Cushing disease, FSH & TSH tumours
Nonsecretory (25%)			

### Clinical presentation

#### Localized mass effects


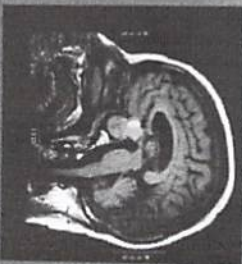
- Chiasmal syndromes
- Compression of other adjacent structures
  - Cavernous sinus (paresis of 3<sup>rd</sup>, 4<sup>th</sup> or 6<sup>th</sup> CN causing disorders of extraocular motility)
  - Hypopituitarism (direct pressure, vascular damage)
  - Papilloedema (raised ICP, very rare)

#### Endocrine effects

- Hyperscretion

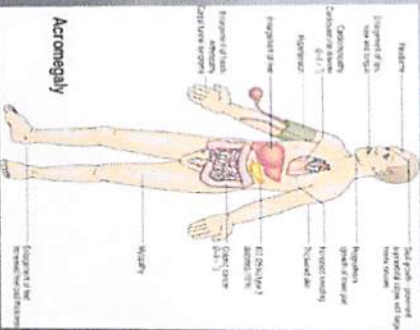
### Classification

Microadenoma	< 10 mm diameter	Secreting adenoma
Macroadenoma	> 10 mm diameter	Mass effects Non-secreting

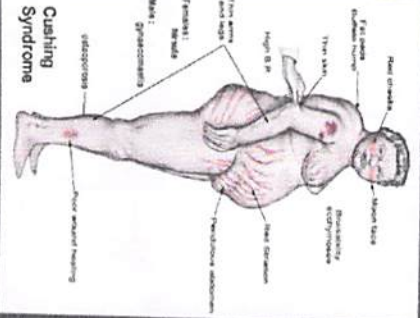
### Hyperscretion

#### Growth hormone



**Acromegaly**

#### ACTH



**Cushing Syndrome**

## Hyperscretion Prolactin

### Female

- Infertility-amenorrhea - galactorrhea

### Male

- Hypogonadism, impotence, sterility, ↓ libido, gynecomastia, galactorrhea



## Hyposecretion

### Growth hormone deficit

- In children: dwarfism
- In adults: weakness, overweight, reduced cardiac output, low blood sugar levels, and reduced exercise tolerance

### TSH deficit

- Hypothyroidism

### ACTH deficit

- Underactive adrenal gland, which causes low blood pressure, hypoglycemia, fatigue, weight loss, vomiting, and low stress tolerance

### ADH deficit

- Diabetes insipidus

## Chiasmal Syndromes

### Blurred vision

### Headache

### Diplopia

### Colour desaturation

### Visual field defect

### Optic atrophy

### Post fixation blindness

### Visual hallucination

### See-Saw nystagmus

## Visual field defect in pituitary adenoma

### Bitemporal hemianopia

### Incongruous homonymous hemianopia

### Bitemporal central scotoma

### Diffuse scotoma

### Junctional scotoma

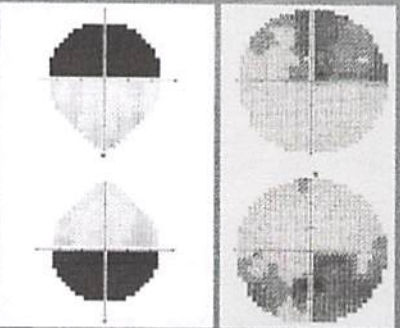
## Bitemporal hemianopia

Classic defect in pituitary adenoma

Occurs in central chiasmal defect

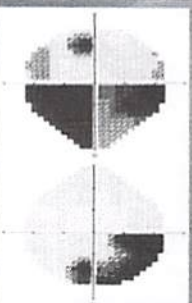
Supertemporal field affected first

Lower temporal field defect



## Incongruous homonymous hemianopia

Occurs in optic tract lesion



## Bitemporal central scotoma

Occurs in post-chiasmal lesion

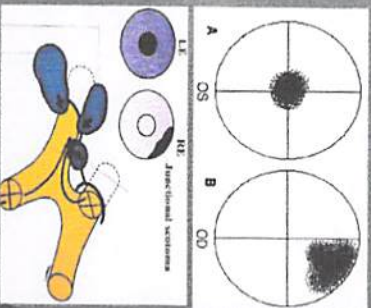
Compressing only the macular fibers



## Junctional scotoma

Central scotoma in one eye with superotemporal visual field loss in the other eye

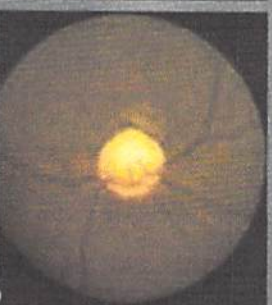
Caused by compression to anterior loop to the decussating nasal fibers in posterior optic nerve (Von Wilbrand's knee)



## Fundus picture

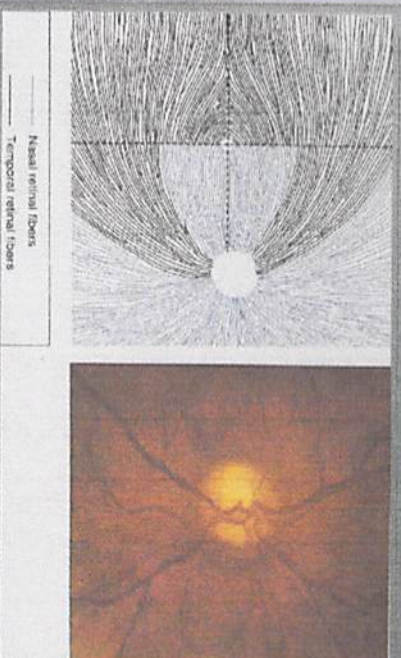


Optic atrophy



Diffuse atrophy

## Bow tie atrophy



## Pituitary apoplexy

- Large adenoma leading to haemorrhage or infarction of pituitary gland
- Occur in pregnancy
- Compresses hypophysial portal vessels
- Presentation: hyperacute chiasmal syndrome
- Treatment: high dose steroid / surgery

## Ocular Examination

- Visual acuity
- RAPD
- Color vision
- Ocular motility
- Fundus examination

## Investigations

- Endocrinological evaluation
  - Serum prolactin
  - FSH
  - TSH
  - GH
  - Insulin stress test
- Ocular investigation
  - Visual Field Analysis
  - Hess / Lees chart

### Imaging

- MRI / CT scan of brain
- X-ray skull (Ant & Lat. view)



### Treatment

Referral to Endocrinologist & Neuro-surgeon

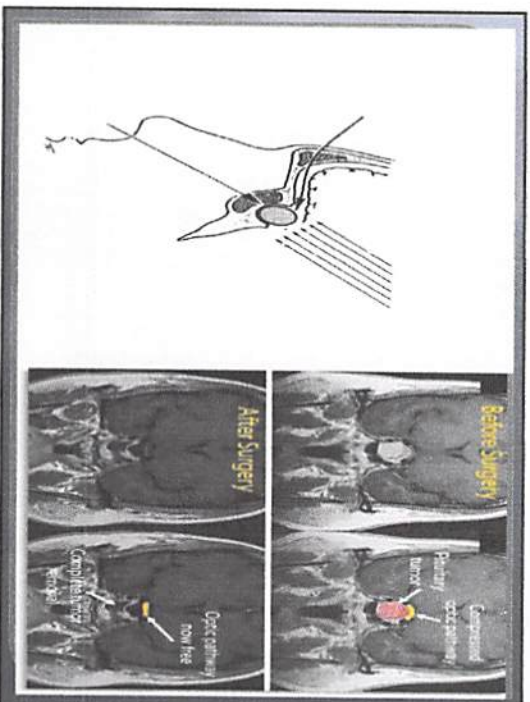
Observation

Medical therapy

- Dopamine agonists – Cabergoline/Bromocriptine

Surgery

- When mass causing severe compression
- Endoscopic - Transphenoidal, transfrontal
- Craniotomy
- Visual recovery is tri-phasic



Radiotherapy

- Following incomplete removal of tumour
- Primary treatment

Gamma knife stereotactic radiotherapy

- Close proximity to the optic nerve
- Cavernous sinus invasion



### Therapeutic Modalities Summary

	Surgery	Radiotherapy	Medical
Non-functioning adenoma	1-4 yrs	2-4 yrs	2-4 yrs
Prolactinoma	1-2 yrs	2-4 yrs	2-4 yrs
Acromegaly	1-2 yrs	2-4 yrs	2-4 yrs
GH secreting adenoma	1-2 yrs	2-4 yrs	2-4 yrs

### Follow-up after treatment

**Medical therapy –**

- Monthly for large tumors or during pregnancy for tumors of any size
- 6 month intervals in microadenoma for 1 year, then yearly

**Surgery –**

- Immediately postoperatively
- 4-6 weeks postoperatively
- 4 months intervals for a year
- Yearly for 5 years
- Every 2 years

### Radiotherapy –

- At the midpoint and end of radiotherapy
- 3 months interval for a year
- 6 months interval for a year
- Yearly

**Evaluation -**

- Visual acuity
- Fundoscopy
- Visual field
- Imaging

### Conclusions

Pituitary adenomas occurs with a wide spectrum of clinical features

Should be managed between different specialists

Neuro-ophthalmological manifestations are frequent and varied

Physicians must be aware about these in order to refer patients to ophthalmologist for early diagnosis and treatment

## Case Report

- 39-year-old male with painless progressive vision loss
- Chief Complaint:** Painless central vision loss in the left eye
- History of Present Illness:** This adult female presented to the comprehensive ophthalmology clinic with painless central vision loss in the left eye, recently diagnosed on an employee screening examination. She had noted difficulty with reading and an episodic "white light" in her central vision of the left eye.

**Past Ocular History:** Negative for surgery or trauma

**Past Medical History:** Hypertension, diabetes

**Medications:** Enalapril, statins

**Family History:** Negative for cancer, ocular disease

**Social History:** Nonsmoker, long-term smoker

**Review of Systems:** Negative including no weight change, mood change, fatigue, or loss of libido.

## Ocular Examination

- Visual acuity without correction: 20/25 right eye (OD), 20/125 with eccentric fixation left eye (OS)
- Intraocular pressure: 10 mmHg OD, 12 mmHg OS
- Pupils: 5 → 3 mm in both eyes (OU), brisk reaction OU, 0.3 log-unit relative afferent pupillary defect OS
- Confrontation visual fields: temporal loss OD, central scotoma OS
- Anterior segment: 1+ nuclear sclerosis OU, otherwise normal

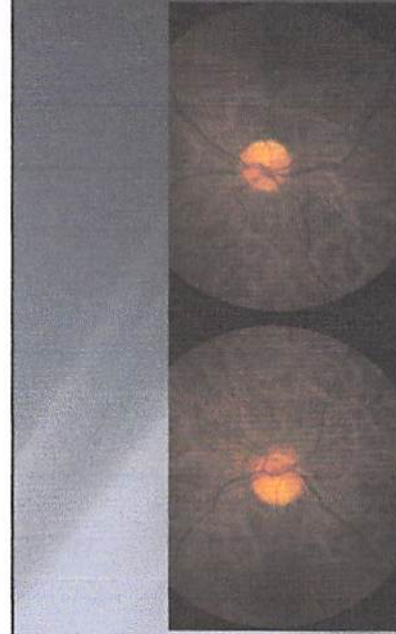


Figure 1. The fundus of the left eye shows a pale optic disc, a normal cup-to-disc ratio, and normal retinal vessels. The fundus of the right eye shows a normal optic disc, a normal cup-to-disc ratio, and normal retinal vessels. Contrast-enhanced magnetic resonance imaging (MRI) of the paranasal sinuses area is shown (Figure 2).

