71 Y.O. WOMAN WITH WORSENING MIGRAINES

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I do not have any relevant financial relationships with any commercial interests

OBJECTIVES

- Pituitary incidentaloma work up
- Nonfunctioning pituitary adenoma management
- Perioperative assessment and management
- Natural history and postoperative follow up

HPI

71. y.o. woman with history of ocular migraines, presents with following symptoms:

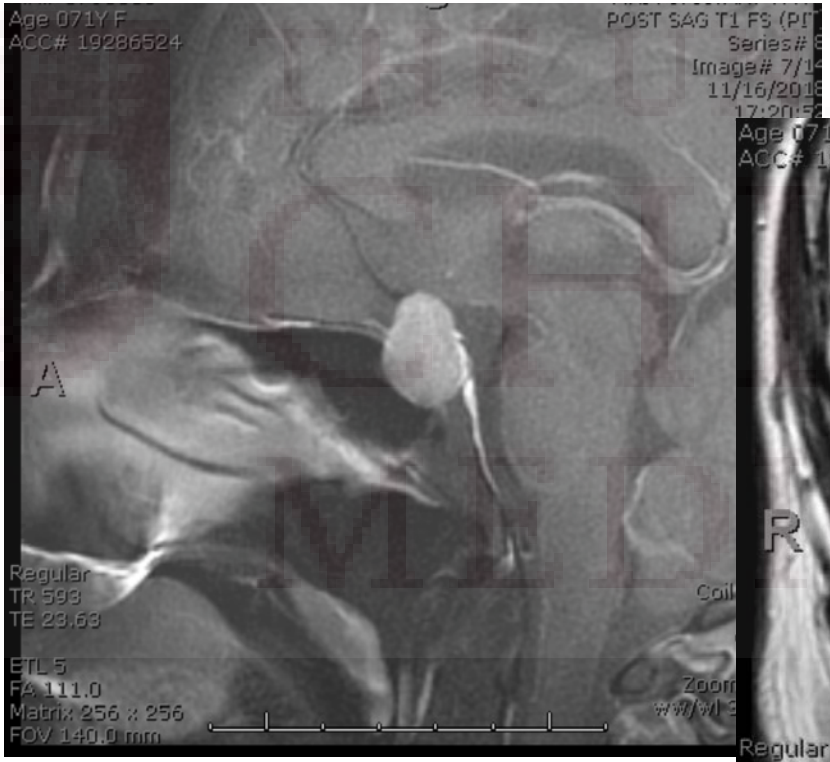
- Intermittent head pressure, progressive fatigue and increased sleepiness
- Occasional double vision in the past 6 month in addition to auras and blurred vision 2/2 migraines
- Denies breast discharge, change in appearance, hands or feet size, dizziness, N/V, appetite change.
- Denies constipation, dry skin
- Denies head trauma

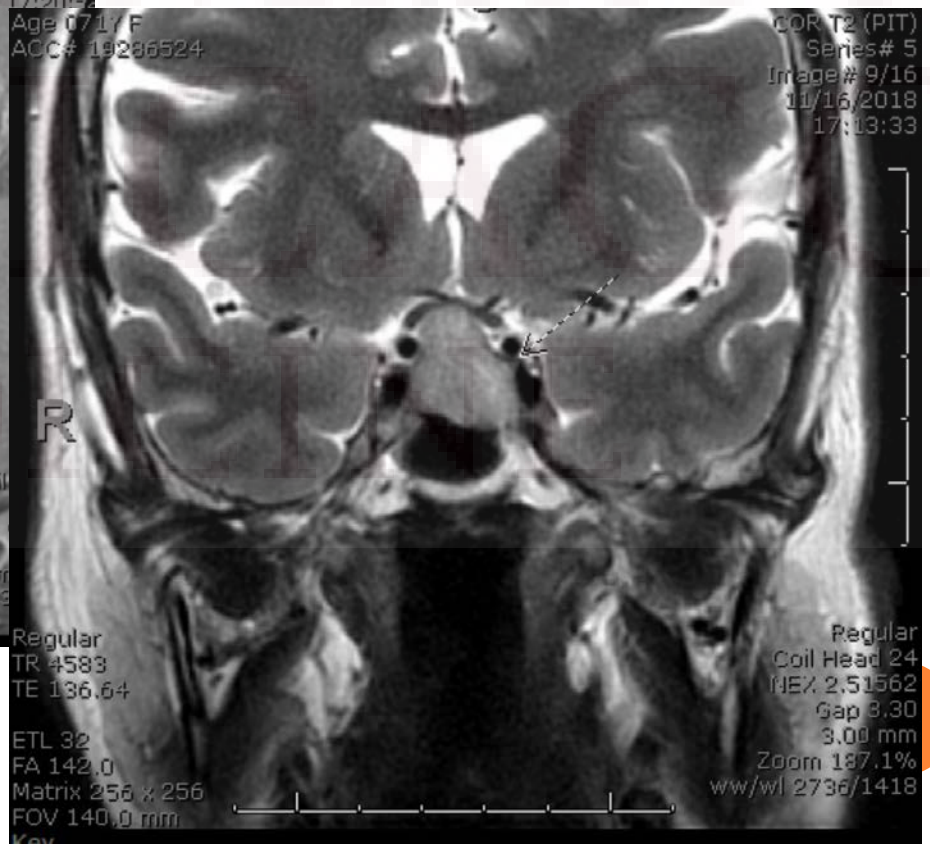
- In 2015 patient had pituitary MRI that showed pituitary adenoma 10x11x9 mm

Outside ophthalmology visit 1 year prior to UofC visit

1. Ocular migraine
2. Photopsia when wakes at night
3. No optic nerve swelling or pallor

1. Sellar/suprasellar mass (15mm transverse x 13mm AP x 20mm CC) compatible with macroadenoma. Involvement of left cavernous sinus with insinuation between the turns of the cavernous left internal artery.
2. Upward bowing of the optic chiasm in part due to rightward deviated stalk in addition to upper margin of mass.





NEXT STEP?

Labs

	11/1/2018 1302
ENDOCRINOLOGY	
Cortisol	*4.2 **
FSH	*6.2 **
Prolactin	*79.26 **
ACTH	*16.1 **
Thyroxine, Free	*0.62 **
TSH Interface Exte...	*0.9*

Component	Value	Ref Range & Units	Status
IGF1 LC MS	49	34 - 187 ng/mL	Final
IGF1 Z SCORE	NEG 1.28	NEG 2.0 - +2.0	Final

“patients with histologically confirmed nonfunctioning pituitary macroadenomas, a prolactin level greater than 94 µg/liter reliably distinguished between prolactinomas and nonfunctioning adenomas”

Diagnosis and Treatment of Hyperprolactinemia: An Endocrine Society Clinical Practice Guideline

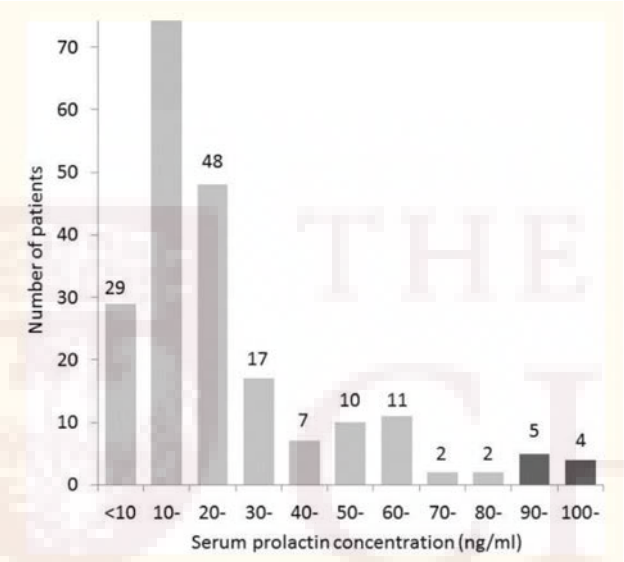
Shlomo Melmed, Felipe F. Casanueva, Andrew R. Hoffman, David L. Kleinberg, Victor M. Montori, Janet A. Schlechte, John A. H. Wass

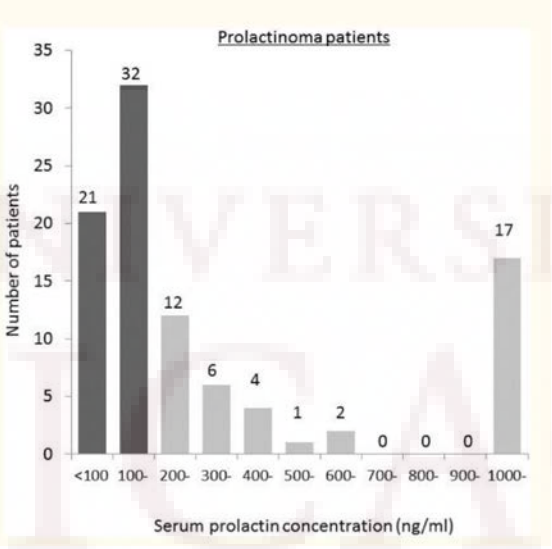
Discrimination of prolactinoma from hyperprolactinemic non-functioning adenoma

Jae Won Hong · Mi Kyung Lee · Sun Ho Kim · Eun Jig Lee

Endocr (2010) 37:140–147

- 48% of NFPA stained positive for prolactin
- DAs should be considered before surgery [in patients with borderline Prl 94-200ng/mL], even when a patient is suspected to have NFPA. If these patients do not respond to DAs within 3 months, especially in tumor size reduction, surgery should not be delayed because prolonged use of DAs may cause peritumoral fibrosis and make tumor resection difficult.





NFPA

prolactinoma

Tomohiro Kawaguchi, BMC Res Notes. 2014

Back to patient

- Started on HC 20/10
- LT4 75mcg several days after HC
- Referred for formal VF testing
- Referred for surgery

Patient had TSS 12/2018

- Complicated by ocular migraine episode morning after Sx, requiring ophthalmologic evaluation
- Transient DI
- HAs continued after surgery

- Pathology report:

PITUITARY ADENOMA.
- Positive for SF-1 consistent with gonadotroph adenoma.
- Focal staining for LH by IHC.
- Negative for other pituitary hormones by IHC.

HISTOCHEMICALLY:

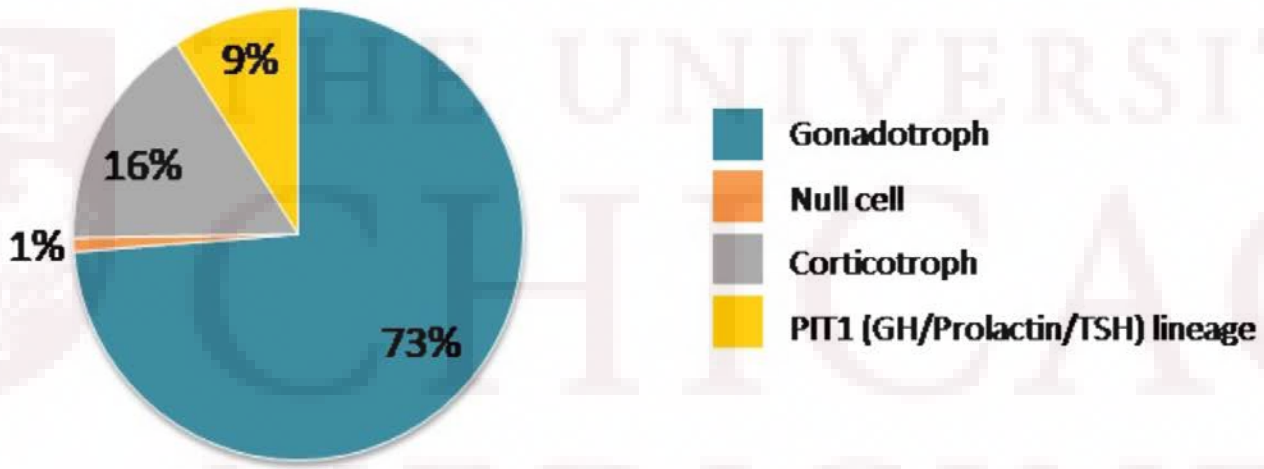


Figure 2

- Prevalence of silent pituitary adenoma subtypes according to immunochemistry for anterior pituitary hormones and transcription factors. Adapted from *Nishioka et al.*, 2015

Nonfunctioning pituitary adenoma

- 2nd most common type of pituitary tumor (15-30% of all pituitary adenomas)

- MC presentation:
  - VF deficits (60-79%),
  - HA (19-75%),
  - Apoplexy (NFPA 45-82% of all apoplexy cases)

  - Hypopituitarism (partial 37-85%, pan 6-29%)
    * 61–100% of patients having GH deficiency
    * central hypogonadism is noted in 36–96% of patients
    * central hypothyroidism 8–81%
    * central adrenal insufficiency is noted in 17–62%

Fig. 1 Sequence of pituitary hormone loss in relation to increasing mass effect from a pituitary tumour

Central hypothyroidism and its role for cardiovascular risk factors in hypopituitary patients. Ulla Feldt-Rasmussen, Endocrine 2016

Surgery or monitoring?

- The best treatment strategy for an asymptomatic NFPA is not yet defined
- ~50% of these tumors will increase in size during long-term follow-up
- nearly 20% of patients will require surgical intervention

- Tumor size decreased or remained stable in 40% of macroadenomas and 47% of microadenomas
- median annual growth rate of enlarging macroadenomas and microadenomas was 1·0 mm/year and 0·4 mm/year, respectively

› Clin Endocrinol (Oxf). 2015 Dec;83(6):861-5. doi: 10.1111/cen.12860. Epub 2015 Aug 12.

Clinical outcomes in patients with nonfunctioning pituitary adenomas managed conservatively

Amir H Sam [1,2], Sachit Shah [1], Keenan Saleh [2], Jay Joshi [2], Federico Roncaroli [3], Stephen Robinson [1], Jeremy Cox [1], Niamh M Martin [1,2], Nigel Mendoza [1], Karim Meeran [1,2], Amrish Mehta [1], Waljit S Dhillo [1,2]

Surgery indications (ES guidelines)

- visual field deficit;
- signs of compression by the tumor leading to other visual abnormalities, such as ophthalmoplegia, or neurological compromise due to compression by the lesion;
- a lesion abutting the optic nerves or chiasm;
- pituitary apoplexy with visual disturbance;
- (European): non-compliant patient, pregnancy desired in the short-term, or context at risk of apoplexy

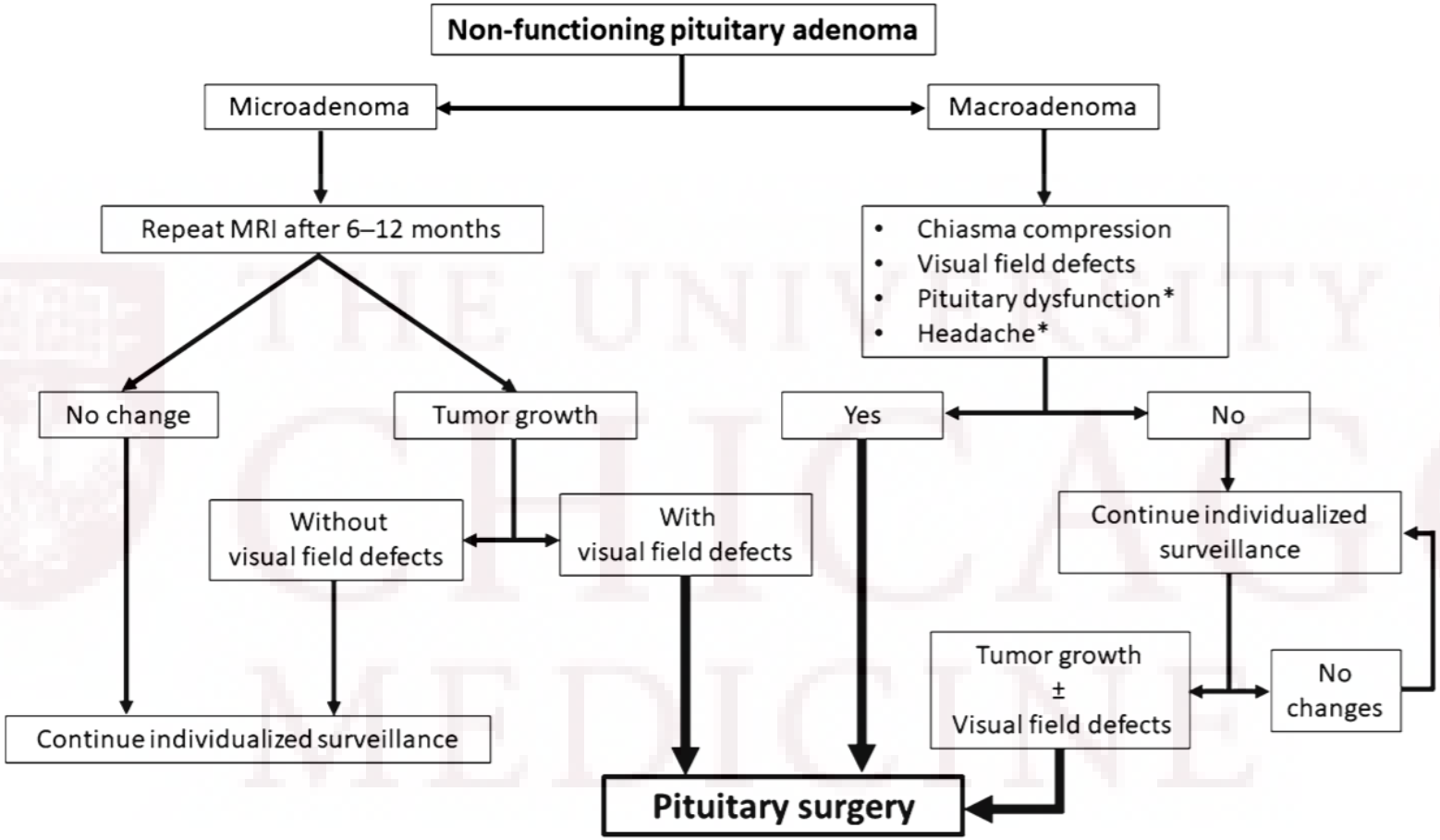
- Relative indications:

• Clinically significant growth of the pituitary incidentaloma

• A lesion close to the optic chiasm and a plan to become pregnant.

• Loss of endocrinological function

Unremitting headache



Pituitary (2019) 22:422–434
https://doi.org/10.1007/s11102-019-00960-0

Non-functioning pituitary adenomas: indications for pituitary surgery and post-surgical management

Daniela Esposito[1] · Daniel S. Olsson[1] · Oskar Ragnarsson[1] · Michael Buchfelder[2] · Thomas Skoglund[3] · Gudmundur Johannsson[1]

Patient's postoperative course

- Continued on HC and Levothyroxine
- VF testing

OD Reliable, nonspecific inferior defects, possible Rim artifact

OS Reliable, nonspecific inferior and temporal defects, possible rim artifact

No signs of bitemporal visual field loss from pituitary mass.

- Asked to hold HC X24h for repeat blood work on follow up visit

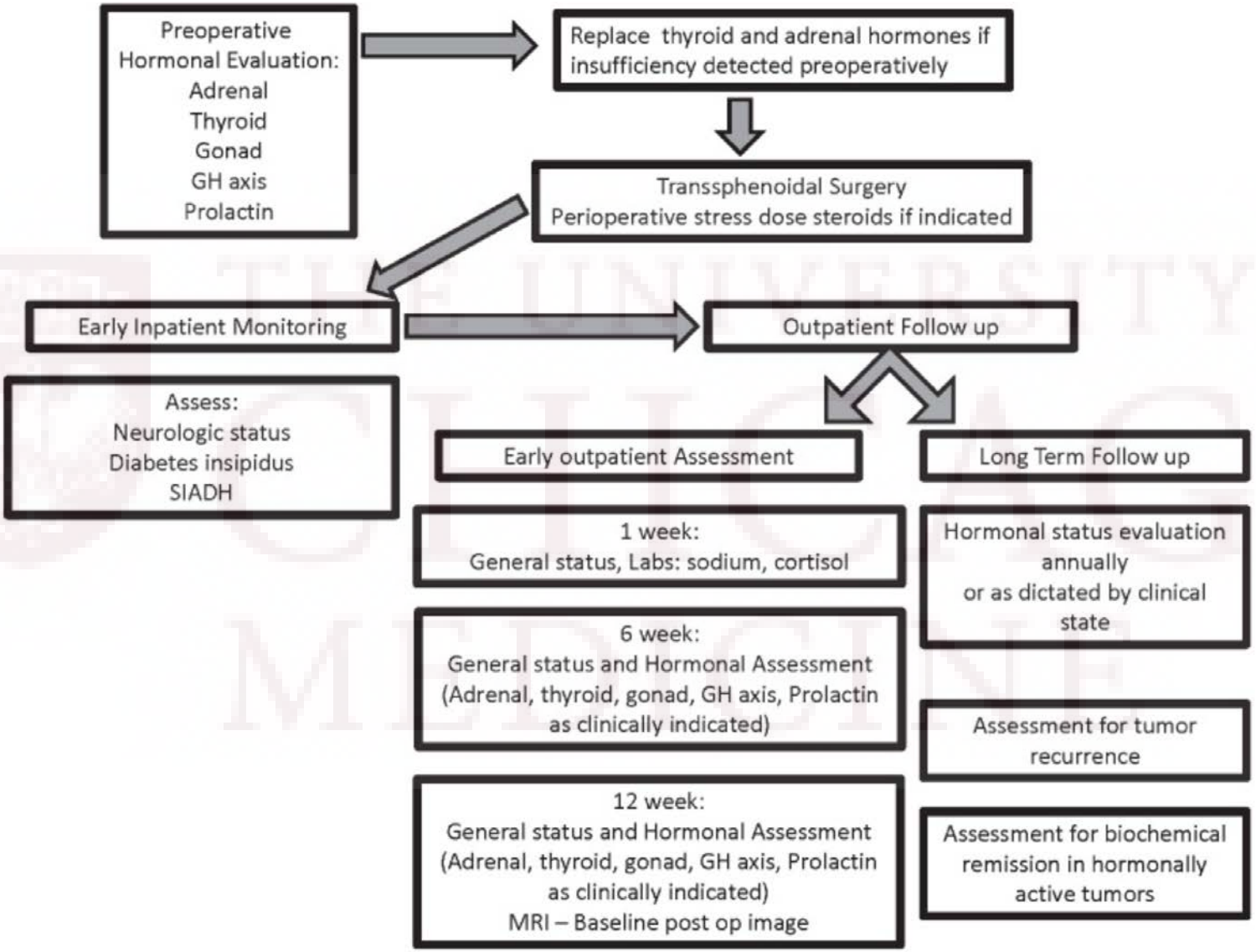
	2/8/2019
TSH	0.94
FT4	1.4
Cortisol	13.1

Postoperative follow-up/prognosis

- Pituitary function reassessment 1-3 mo after Sx
- MRI 3-6 mo after Sx, yearly for 5 years after, followed by every 2 years lifelong surveillance
- Visual fields 3 months after surgery and every 4-6 months after until stable

because of frequent supra- or parasellar extension, surgery is infrequently curative, leaving tumor remnants that regrow during long-term follow-up in a significant proportion of cases

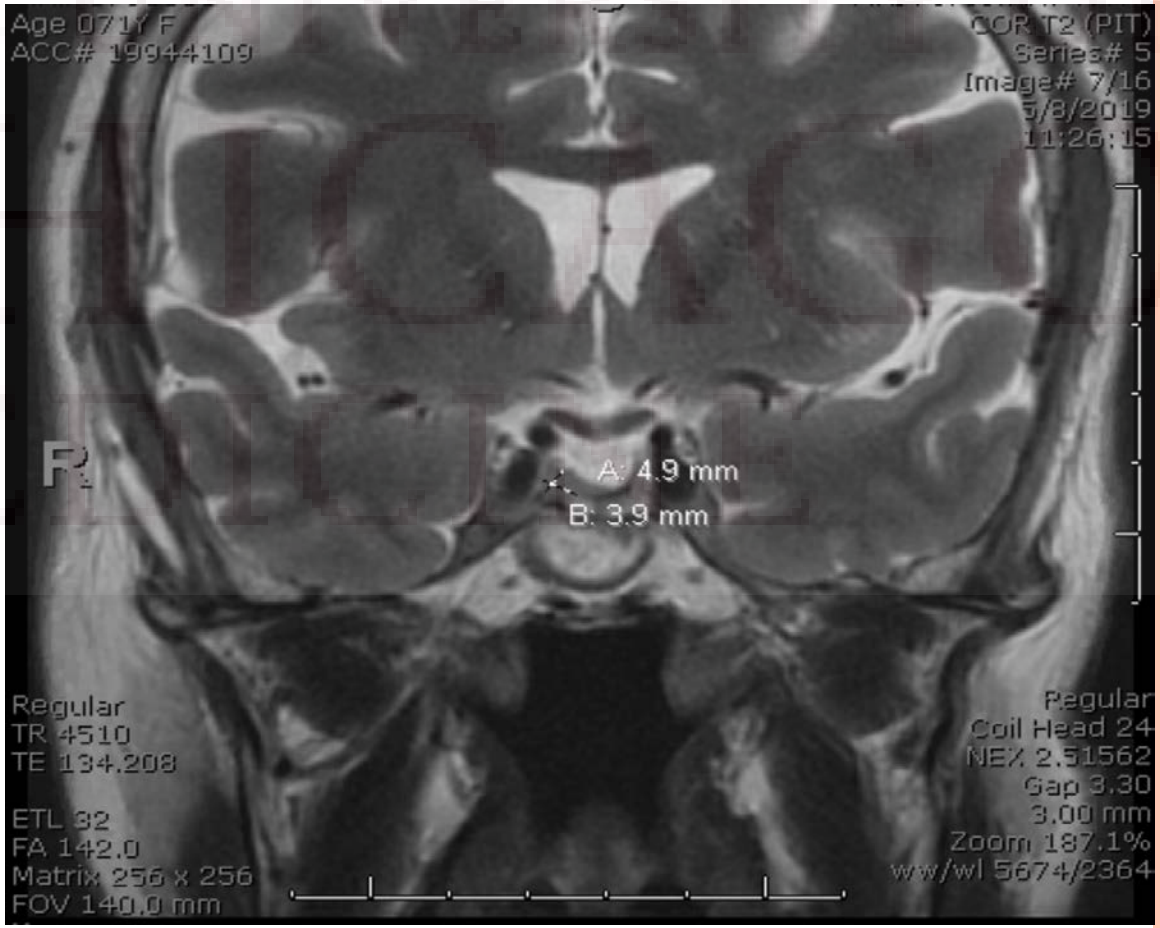
total or near-total resection can be challenging and varies in different series, ranging from 20% to 80%


Preoperative
Hormonal Evaluation:
Adrenal
Thyroid
Gonad
GH axis
Prolactin
Replace thyroid and adrenal hormones if insufficiency detected preoperatively
Transsphenoidal Surgery
Perioperative stress dose steroids if indicated
Early Inpatient Monitoring
Outpatient Follow up
Assess:
Neurologic status
Diabetes insipidus
SIADH
Early outpatient Assessment
Long Term Follow up
1 week:
General status, Labs: sodium, cortisol
6 week:
General status and Hormonal Assessment
(Adrenal, thyroid, gonad, GH axis, Prolactin as clinically indicated)
12 week:
General status and Hormonal Assessment
(Adrenal, thyroid, gonad, GH axis, Prolactin as clinically indicated)
MRI – Baseline post op image
Hormonal status evaluation annually
or as dictated by clinical state
Assessment for tumor recurrence
Assessment for biochemical remission in hormonally active tumors

POST OP PIT MRI 5/2019

1. Interval postsurgical changes of transsphenoidal resection of pituitary adenoma. There is subcentimeter enhancing tissue in the right aspect of the sella which may reflect normal pituitary tissue but is nonspecific. There is no definite evidence of residual tumor. This study can serve as a postoperative baseline.

2. Optic chiasm is well decompressed



Follow up blood work

	preop	2/8/2019	9/26/2019
TSH	0.9	0.94	
FT4	0.65	1.4	1.58
Cortisol	4.2	13.1	
ACTH	16.1		
FSH	6.2		25
IGF1	49		71 (34-187)

RECOVERY AFTER SURGERY

- Recovery of visual deficits
  - It is recommended that older patients and patients with longer duration (>4 months) of vision loss be counseled regarding the reduced chance of postoperative vision improvement (neurosurgery guidelines 2016)
  - Improvement in most, 30% recover, 4% worsen (Ivo S. Muskens, pituitary 2017)
- HA 70% had improvement by 6 months postoperatively, while headache worsened in 7.6% of patients (all tumors, J. of neurosurgery 2016)

Pituitary function recovery

- 30.1% showed improvement
- 48.9% had persistent deficits
- 1.4 % showed deterioration of pituitary function

Clinical Article

Impact of primary surgery on pituitary function in patients with non-functioning pituitary adenomas – a study on 721 patients

P. Nomikos[1], **C. Ladar**[1], **R. Fahlbusch**[2], and **M. Buchfelder**[1]

[1] Department of Neurosurgery, University of Erlangen-Nürnberg, Erlangen, Germany
[2] Department of Neurosurgery, University of Göttingen, Göttingen, Germany

Published online January 7, 2004

CLINICAL ARTICLE
J Neurosurg 124:589–595, 2016

Improved versus worsened endocrine function after transsphenoidal surgery for nonfunctional pituitary adenomas: rate, time course, and radiological analysis

*Arman Jahangiri, BS, Jeffrey R. Wagner, BS, Sung Won Han, BS, Mai T. Tran, MD, MPH, Liane M. Miller, BS, Rebecca Chen, BS, Maxwell W. Tom, BS, Lauren R. Ostling, MD, Sandeep Kunwar, MD, Lewis Blevins, MD, and Manish K. Aghi, MD, PhD

New deficits occurred in 14% of patients

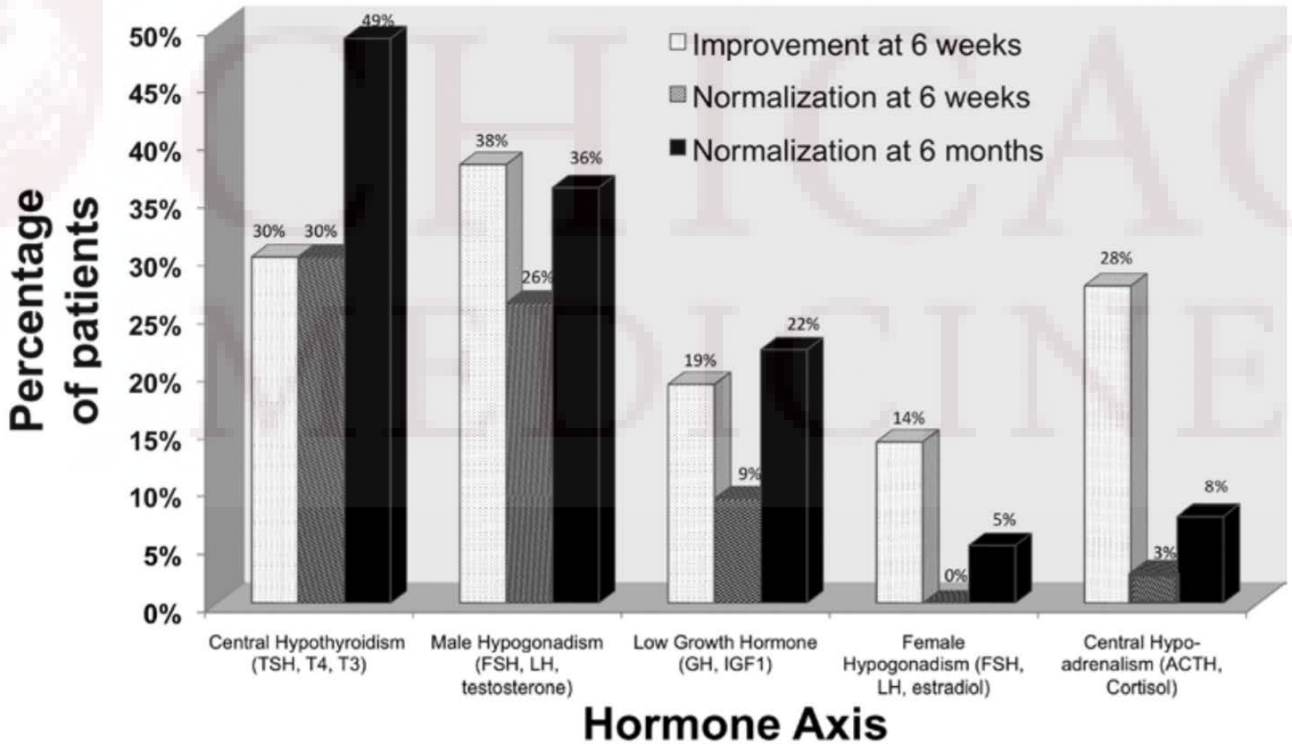


FIG. 2. Bar graph comparing the 6-week and 6-month postoperative endocrine normalization rates for each of the 5 individual axes assessed.

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