22 year old woman with panhypopituitarism

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August 16, 2012

HPI

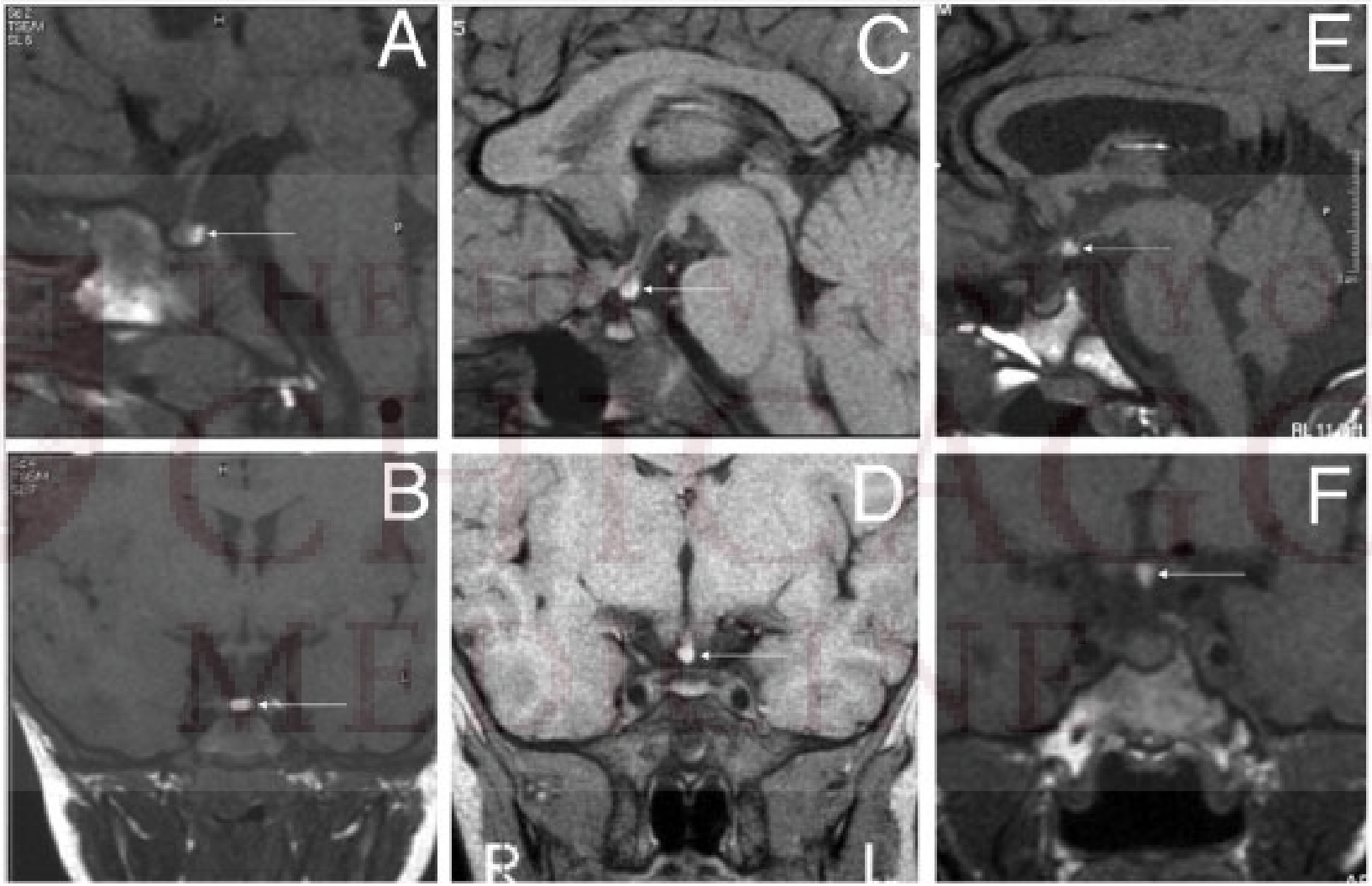
- 22 year old female with panhypopituitarism presenting for transition to adult clinic
- Followed in peds endo clinic since 8/1994 at age 5 11/12, last seen 6 mos prior
- On HC, LT4, and OCP, had received GH 1994-2004
- Off OCP 2-3 mos, last period 2 mos ago
- Primary complaint is fatigue

Past History

- Presented at age almost 6 with short stature
  - Height 88.1 cm (<<3%)
  - Bone age 2.5 years
  - Found to be hypothyroid with TSH 5.5, T4 2.9, FTI 3.6
  - TRH stimulation testing: T4 3.5->5.0, FTI 5.0->6.9, T3 54->88
  - Started on LT4

Past History

- School performance and overall well-being improved, growth still poor
  - 6 6/12 IGF-1 <72
  - GH stimulation testing showed severe GH deficiency
  - Started GH treatment with excellent response
  - MRI of pituitary: Partially empty sella is noted. A pituitary stalk is not visualized. The preinfusion T1 weighted images demonstrate tiny focus of increased signal in the tuber cinereum which enhances on the postinfusion images. This finding is compatible with an ectopic posterior pituitary gland.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Past History

- Continued to do well on thyroid and GH replacement
- Still Tanner 1 at 12 3/12 years with bone age 11 years
  - 12/2000 labs: LH <0.15, FSH <0.2, ACTH 10, cortisol 1.9, DHEA-S <5
- Instructed to use stress dose steroids for illness
- Physical exam and labs remained prepubertal-> started on Premarin for pubertal induction in 4/2002 at 13 8/12 years

Past History

- Transitioned to OCP, menarche at 15.5 years
- Growth hormone discontinued in 2004 at age 16
- Started on daily hydrocortisone in 2005 due to complaints of fatigue
- HC increased from 10/5 to 15/10 in 2006 due to continued fatigue
- Frequently noncompliant with OCP
- Restarting GH discussed multiple times starting in 2007 at age 18 10/12 due to continued fatigue

Other History

- Other PMH
  - Eczema
  - Seasonal allergies
- Medications
  - LT4 200 mcg, Ortho Tri-Cyclen, Hydrocortisone 15 mg am, 10 mg qhs
- Family History
  - No hypopituitarism, PGF with DM2
- Social History
  - Senior in college majoring in marketing and graphic design

Physical Exam

- 53.3 kg, 65 inches, HR 72, BP 111/57
- Gen: Pleasant, well-appearing
- HEENT: No midline defects, EOMI, PEERL, OP clear
- Neck: No thyromegaly
- Lungs: CTAB
- CV: RRR, nl heart sounds
- GI: soft, NT/ND
- MSK: Nl ROM, no edema
- Skin: +eczema, no other rashes, lesions
- Neuro: A+O x 3, nl reflexes

Next Steps

- Stressed importance of compliance with OCP
- Instructed her to take hydrocortisone in afternoon instead of bedtime
- TFTs: TSH 6.94, T4 6.9, FT4 1.30, T3 50
- ? Growth hormone
  - BMD

Follow Up

- BMD
  - L1-L4 T -2.4, Z -2.7
  - Total hip T -2.8, Z -3.5
- Risk factors for low bone density?
  - Vitamin D deficiency
  - Low calcium intake
  - Excessive glucocorticoid replacement
  - Excessive LT4 replacement at times
  - Growth hormone deficiency
  - Lack of consistent estrogen replacement
  - Other?

Follow Up

- Energy improved with taking HC in afternoon
- Back on OCP with regular periods
- What to do about low bone density?
  - GH discussed
  - Decreased HC to 10/5
  - Increased estrogen supplementation by starting on Combipatch .05/.14

Labs

- 25OHD 35
- CMP nl including Ca 9.3
- PTH 49
- Osteocalcin 22.3 (9-33)
- CTX 561 (70-573)
- 24 hour urine Ca 64

Follow Up

- Feels well on HC 10/5
- Compliant with Combipatch, having periods
- Directed to increase calcium intake
- Plan to recheck BMD after ~ 1 year

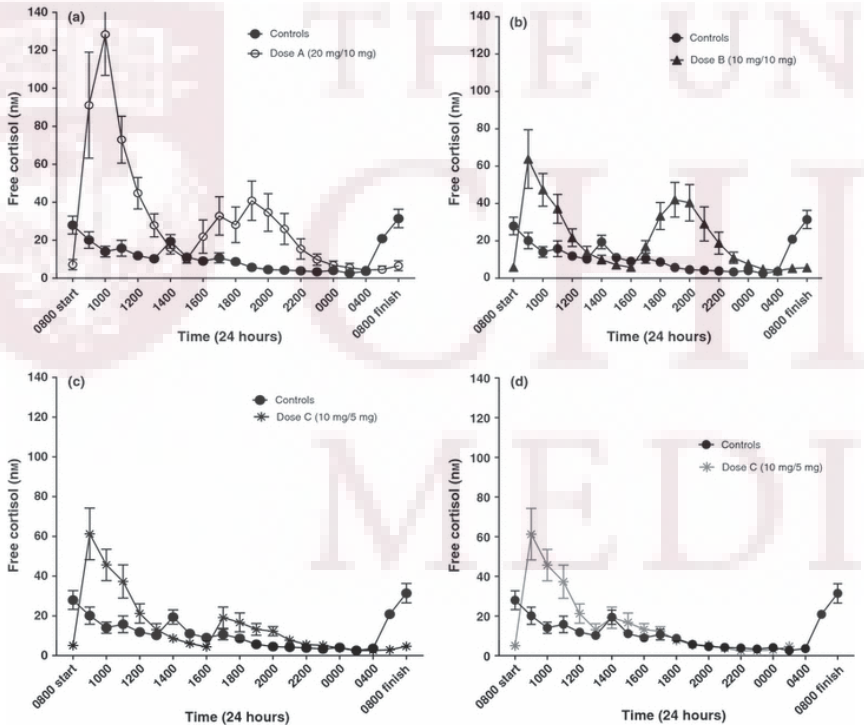
Ectopic Posterior Pituitary

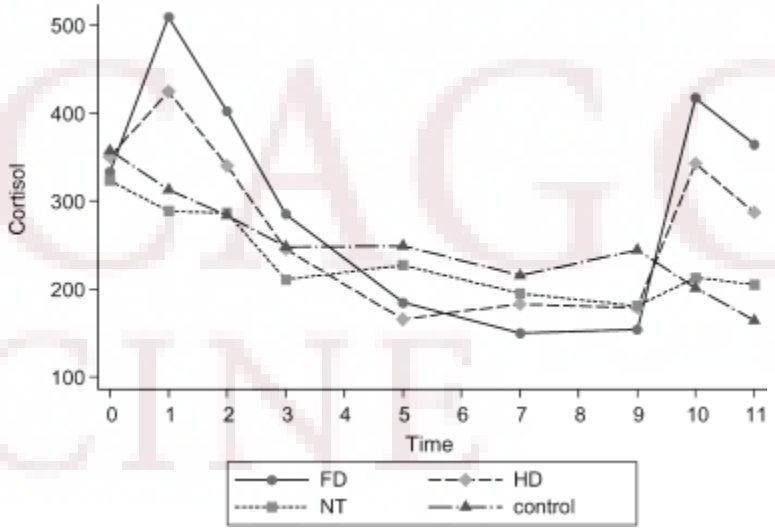
- MRI finding associated with pituitary dysfunction
- May be associated with abnormal stalk, small anterior pituitary, septo-optic dysplasia
- Genetic and birth history associations
- Spectrum of pituitary abnormalities from isolated GH deficiency to multiple pituitary hormone deficiency
  - Anterior pituitary height
  - Posterior pituitary height
  - Posterior pituitary surface area
  - Stalk vs. hypothalamic sited PP

GC overreplacement is common and has negative consequences

- Daily cortisol production 5.7 mg/m2/day
- Study of 32 pts on GC replacement found 75% required dose reduction based on cortisol day curves and 24 urine free cortisol
  - Increase in osteocalcin
  - Correlation with BMD
- Study of 2424 hypopituitary pts in KIMS database showed increased BMI, TGs, LDL, total cholesterol with higher doses in dose dependent manner

Low replacement doses approximate physiology





Continuation of GH after final height?

- 2005 JCEM study
  - GH deficient adolescents retested-> controls vs. persistent GH deficiency treated vs. untreated x 2 years
  - No difference in BMD, body composition, lipids, insulin resistance and sensitivity, grip strength, QOL
- 2003 and 2004 JCEM studies
  - 149 subjects s/p pediatric GH treatment with proven ongoing GHD-> controls vs. adults dose (12.5 mcg/kg/d) vs. pediatric dose (25 mcg/kg/d)
  - Greater increase in BMC and BMD in treated vs. untreated
  - Greater increase in LBM, decrease in fat mass

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