8 y.o male with renal failure, short stature and early puberty

Stelios Mantis, MD
2-9-12
Initial Presentation

CC: 8 y.o male w MDKs presents to endo clinic with short stature.

HPI: Diagnosed w MDKs soon after birth. Received a cadaveric transplant at age 1 but this failed by age 2. Has been on PD since. Pt was initially seen for short stature at age 6. Pt is 3 St Dev. from mean on growth chart. Known kidney dz and short stature qualifies him for GH.
HPI Cont.

Mom is reluctant to start GH therapy. Pt detests injections and are hopeful another Tx may obviate need for GH. Pt followed over next 2 yr and cont to decline GH. At age 8 family is now interested in GH.

Past Med Hx: Dyplastic kidneys, poor growth, iatrogenic Cushing, long term steroid use, renal Tx, peritoneal dialysis
Presentation

Social Hx: Lives w/ mom, older sister, younger brother.

Family Hx: No maternal hx of precocious puberty or renal problems, unknown paternal hx. Mid-parental ht: ~6ft.

ROS: obese, socially delayed, no polyuria, or polydipsia, no HA, no blurry vision, no adult body odor, no physical signs of puberty per mom. Does make some urine. Diagnosed w hypothyroidism 2 months prior to visit TSH of 7.46 FT4: 1.02

All other systems negative.
Meds

• Meds: prednisone 2.5 mg (~8.5 mg/m2), epogen, levothyroxine 25 mcg, sodium bicarb, Tums, Miralax, pepcid, rocaltrol
Physical Exam

Vitals: 36.5, 128 (crying), BP: 96/52. Ht: 110 cm (3 st dev below mean; ht age 5.5 yr old; GV: 4.9 cm/yr), Wt 36.7 kg (over 97th%).
Gen: crying, not cooperative w exam, cushingoid appearance
HEENT: anicteric sclera, MMM, no oral lesions. Thyroid: nl
CV: RRR, no murmur
Chest: no palpable breast tissue
Lungs: CTAB
Abd: obese, Soft NT ND, mult scars form prior surg
Skin: no rashes, no birthmarks
GU: No pubic or axillary hair, Testes: 2.6 cm on R, 2.8 cm on L, no transillumination. Phallus difficult to measure due to non compliance.
**Differential Dx of Precocious Puberty in Boys**

<table>
<thead>
<tr>
<th>Central PP</th>
<th>Peripheral PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idiopathic</td>
<td>Androgen overproduction:</td>
</tr>
<tr>
<td>Hypothalamic Hamartoma/tumor</td>
<td>- Leydig cell tumor</td>
</tr>
<tr>
<td>Congenital suprasellar brain defects</td>
<td>- hCG secreting tumor</td>
</tr>
<tr>
<td>Congenital midline abnormalities</td>
<td>- Nonclass CAH</td>
</tr>
<tr>
<td>Cranial irradiation</td>
<td>- androgen secreting adrenal tumor</td>
</tr>
<tr>
<td>Previous meningionencephalitis</td>
<td>- McCune Albright Syndrome</td>
</tr>
<tr>
<td>Major head trauma</td>
<td>- Familial Testotoxicosis</td>
</tr>
<tr>
<td>NF-1</td>
<td>- exogenous androgens</td>
</tr>
<tr>
<td>“Overlap syndrome” (associated w hypo thyroid)</td>
<td></td>
</tr>
<tr>
<td>Hyperprolactinemia</td>
<td></td>
</tr>
<tr>
<td>Activating mutation of gene which mediates effect</td>
<td></td>
</tr>
<tr>
<td>of kisspeptin on stim of GnRH</td>
<td></td>
</tr>
</tbody>
</table>
Labs/Tests

Bone age done at chronologic age 6 revealed skeletal age of 4.17 years

Bone age: Chronologic age 8 1/12yr revealed skeletal age of 6.1 years

Labs done at 8 am
TSH: 4.74 mcu/ml (0.3-4)
FreeT4: 1.28 ng/dl (0.9-1.7)
LH: 3.4 mIU/ml
FSH: 1.3 mIU/ml
Total testosterone: 34 ng/dl
Free testosterone: 0.8 ng/dl
DHEA-S: 28 ug/dl (preadrenarchal)
hCG: undetectable
IGF-1: 440 ng/dl (64-345)
HgbA1c: 5.7 %

Head MRI: Normal, no abnormalities of pituitary of hypothalmus to explain precocious puberty
Definitions

Precocious puberty:
- any pubertal change prior to 6 in AA girls, 7 in Caucasians girls, and 8 years of boys regardless of race
- any pubertal change in girl prior to 8 and boy prior to 9 in conjunction with:
  * Rapid progression of pubertal changes
  * More than 2 SD adv in bone age
  * Café au lait spots and other endocrinopathies
  * Potential exposure to exposure to exogenous sex steroids in home
Back to our patient

• Pt has been started on GH to help with height and Lupron therapy to halt puberty
• Pt developed peritonitis and has been in hospital on and off for several months
Case Report

• Case report from 1983 of 7.5 yr old pt w ESRD who had central precocious puberty BUT also had hyperprolactinemia 52 ng/ml (5-30) w galactorrhea. Pt also had adv bone age and central hypothryoidism. Pt had robust growth spurt (8.7cm/yr) despite CRF. Attributed CPP to hypothalamic dysregulation.
Case report #2 from Nova Scotia

• 3 y.o w prune belly syndrome and CRF. Had increased GV at 18 months, w Tanner 2 pubic hair and testicular enlargement, pubertal LH, hyperprolactinemia (170 mcg/l (3.4-22), normal TFTs and MRI. Was started on Lupron and did not respond as testosterone and LH remained pubertal. Sexual precocity reversed with renal Tx.
References