



83 F with hypothyroidism and osteoporosis who presents with hypoglycemia

Rajesh Jain

November 10th, 2016



HPI

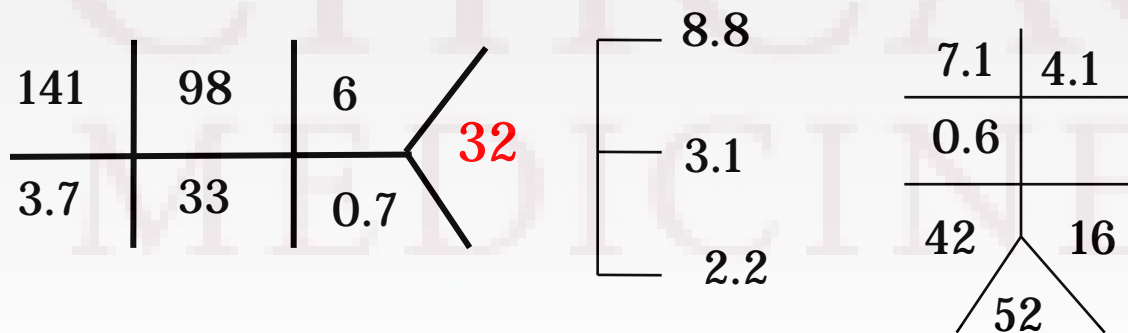
83 F with history of osteoporosis with kyphosis, hypothyroidism, and HTN who was brought into the ED by her daughter for a fall.

Per family, patient had been gradually deteriorating over the past few months with less PO intake. She is usually able to understand things around her and respond appropriately, though daughter/son were concerned about depression. She had a little more swelling in the legs recently which they think may have contributed to her falling when she tried to get up.



HPI

- Hospitalist calls at 8 PM due to hypoglycemia and hypothyroidism. Patient does not have diabetes. Initial blood draw:



TSH 9.51

POC recheck (after treating): 257

U/A: 3+ Glucose



Looking back at her previous labs

	Glucose, Ser/Plasma
Ref. Range	Latest Ref Range: 60 - 109 mg/dL
3/25/2013 1312	68
4/10/2013 1226	64
5/22/2013 1346	73
9/19/2013 1338	56 ▼
9/30/2014 1524	49 ▼
12/26/2014 2017	72
7/1/2015 1617	70
9/28/2015 1510	59 ▼
12/16/2015 1250	53 ▼
2/25/2016 1250	70
10/7/2016 1347	32 * ▼



Extended History

PMH: Craniopharyngioma, diastolic dysfunction, hypothyroidism, osteoporosis with kyphosis

PSH: VP shunt, craniotomy with craniopharyngioma resection

Meds: Levothyroxine 50 mcg po daily, mirtazapine, B12 injections, Calcium carbonate, D3

Social: married, daughter lives in the same building. Unknown if any family member has diabetes or what meds they may be on.

Family history: Non-contributory

Allergies: None



Exam (per hospitalist)

T 33.3, HR 60 (later dropped to 44), BP 158/75, R 17, SpO2 95%, Weight 34.5 kg, Ht 152.4 cm, BMI 14.8

Gen: Cachectic appearing female sitting quietly in chair

Head: atraumatic

Mouth: No oropharyngeal exudate

Eyes: conjunctival pallor

Neck: No JVD, no thyromegaly,

Chest: Heart sounds normal but can't be appreciated properly through the precordium due to her posture

Pulm/Chest: Kyphotic posture; decreased breath sounds at bases

Abd: Soft, BS are normal, no distension, no tenderness, no rebound or guarding

MSK: Edema, 2+ pitting edema bilaterally in the LE

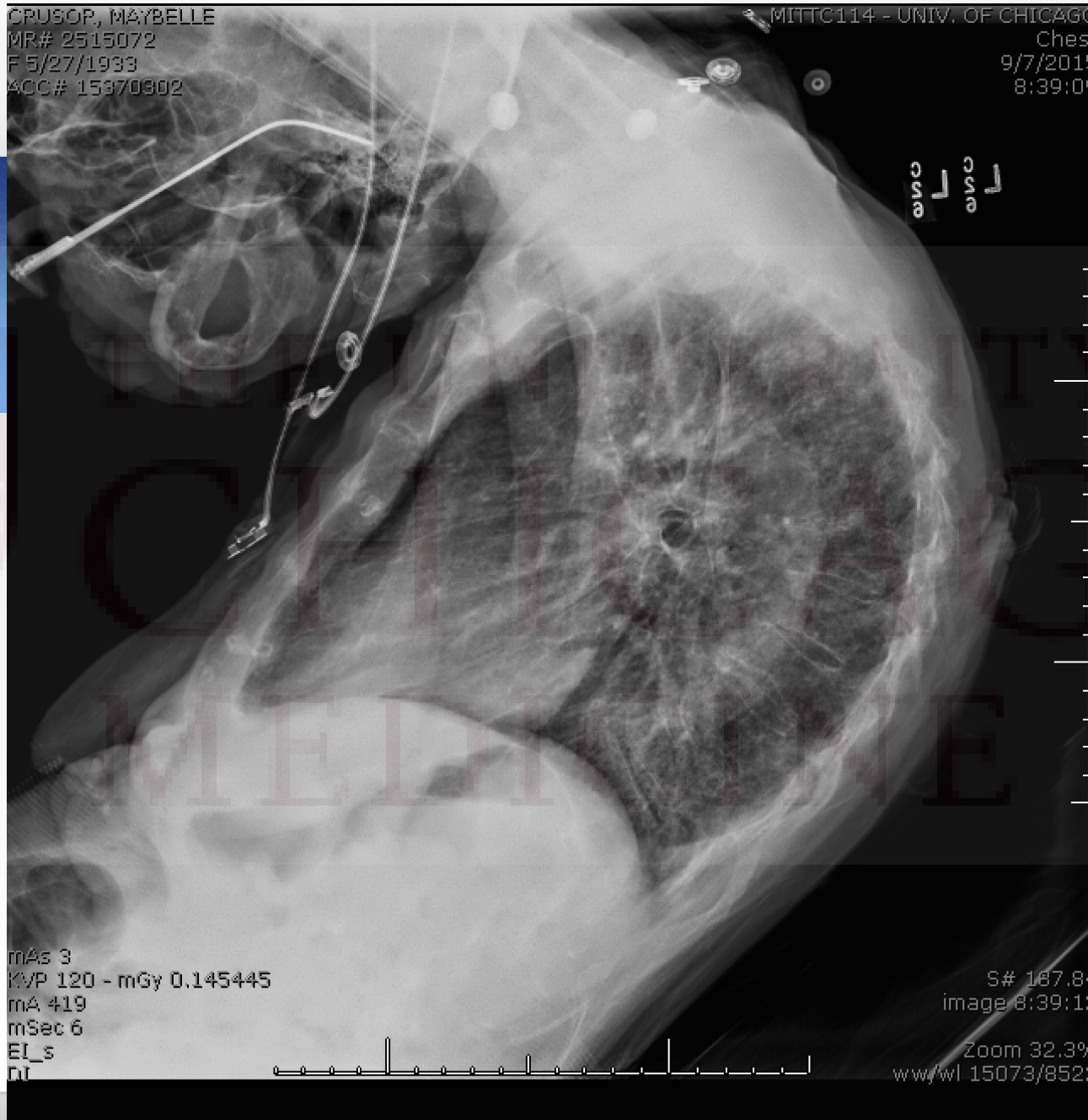
Neuro: Oriented x 2, soft voice, difficult to understand.

Skin: No rash

CRUSOP, MAYBELLE
MR# 2515072
F 5/27/1933
ACC# 15370302

MITTC114 - UNIV. OF CHICAGO

Chest
9/7/2015
8:39:09



mAs 3
KVP 120 - mGy 0.145445
mA 419
mSec 6
EI_s
DI

S# 167,84
image 8:39:13

Zoom 32.3%
www.fwl 15073/8522



Initial Recommendations by Phone?

- Add on Critical Sample and FT4
- Seek history from any family members to see if patient has access to DM meds, send Anti-hyperglycemic screen
- Infectious work up, particularly with the hypothermia (sepsis?)
- Frequent accuchecks to ensure she does not become hypoglycemic again, start D5 if trending down
- Glycosuria likely 2/2 correction for the hypoglycemia
- Continue home levothyroxine dosing

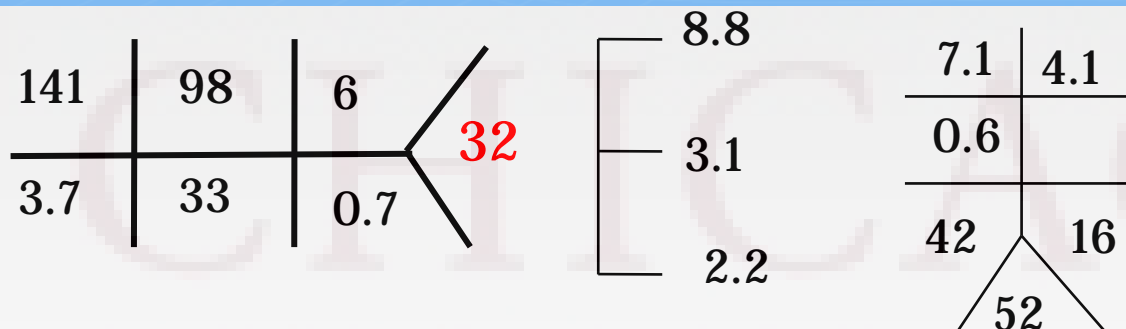


In the meantime....

- Patient underwent CT PE protocol for elevated D-dimer
- After CT PE, patient started complaining of chest pain and worsening SOB
- Patient desaturated to 70% on 4 L Oxygen, patient also noted to be stridorous, tachypneic, and using accessory muscles along with increased tongue/facial edema
- Concerned for allergic reaction – given Epinephrine x 2, methylprednisolone 125 mg IV, intubated



Labs



TSH 9.51, FT4 0.60

Ketones 0.23

Insulin <0.3

C-peptide 0.05

Lactic Acid 0.5

Cortisol 7.4

What now?



Adrenal insufficiency!

- But why?

No ACTH could be added on

Labs were checked before steroids given

No known prior to admission steroid use

Anything else you want to check?



A look at her previous endocrine labs

	13 4/7/2010 1648	12 1/6/2011 1105	11 3/23/2011 1611	10 4/11/2012 1610	9 8/9/2012 1522	8 3/25/2013 1314	7 9/19/2013 1338	6 9/30/2014 1524	5 7/1/2015 1617	4 7/29/2015 1116
THYROID FUNCTION										
Thyroxine, Free			0.52 ▼	1.01						
Estimated FTI			4.3 ▼							
Thyrotropin	0.02 ▼	0.06 ▼	1.48	0.09 ▼	1.49	2.65	0.97	0.26 ▼	0.15 ▼	0.83

Dose: 88->25
→50 50->25 25->25 6 days weekly,
50 once weekly

Unclear dosing but dose reduced

	3 9/28/2015 1458	2 12/16/2015 1250	1 10/7/2016 1347
THYROID FUNCTION			
Thyroxine, Free	0.97 *		0.60 * ▼
Estimated FTI			
Thyrotropin	1.33	1.72	9.51 ▲

Per Epic: 50 mcg daily

Thoughts?

FSH 0.4



Image# 26/53
7/9/2015
13:34:20





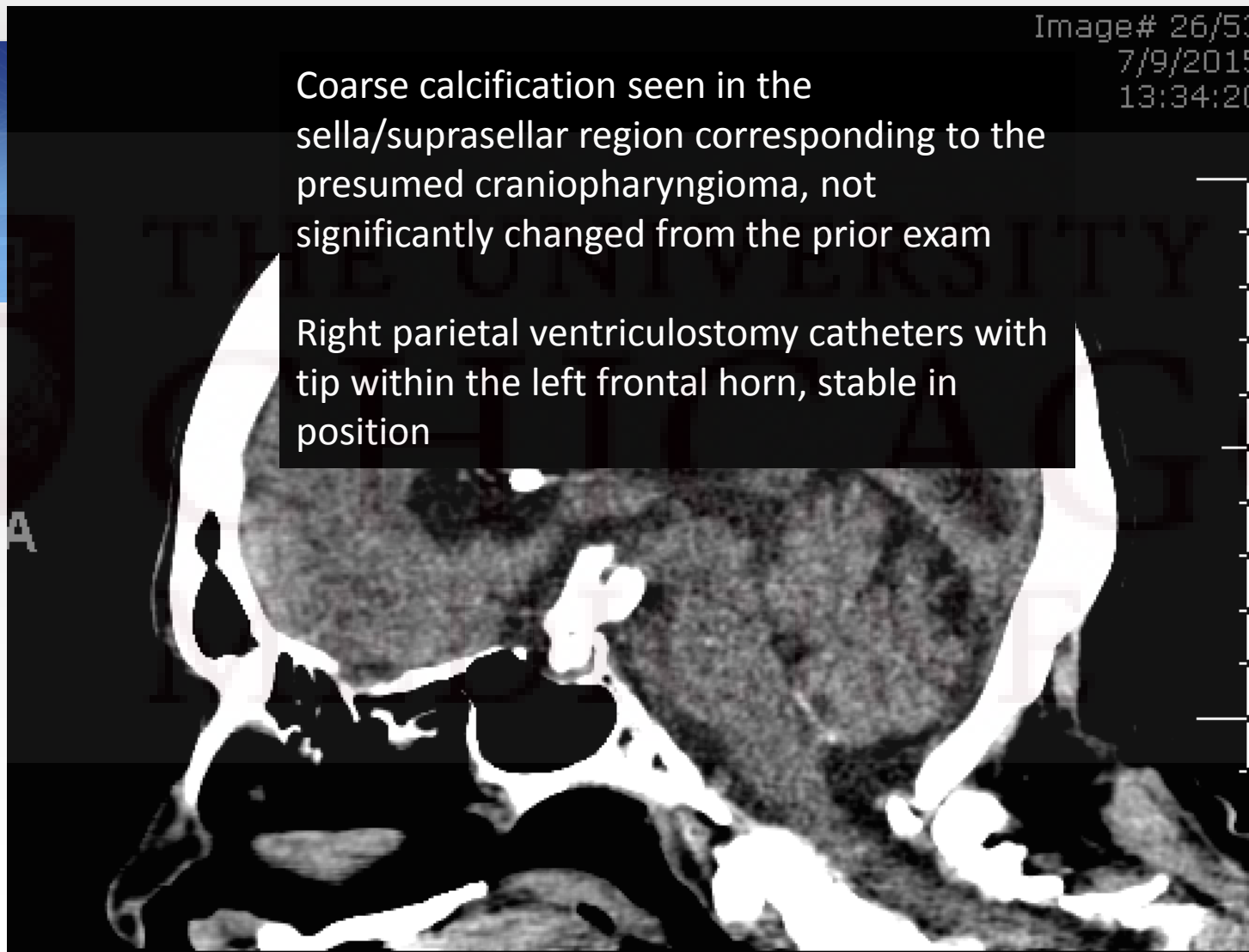
Image# 26/53

7/9/2015

13:34:20

Coarse calcification seen in the sella/suprasellar region corresponding to the presumed craniopharyngioma, not significantly changed from the prior exam

Right parietal ventriculostomy catheters with tip within the left frontal horn, stable in position





Thoughts and Recommendations now?

- Stress dose steroids – Team wanted anti-inflammatory effect for the oropharyngeal edema so used decadron 12 mg
- Continue levothyroxine 25 mcg IV



Craniopharyngioma

- 3% of all intracranial tumors and 10% of childhood brain tumors
- Incidence in the U.S. : 1.3 per million
- Bimodal distribution – peak incidence in childhood (aged 5-14) and older adults
- Histologically benign but tend to behave aggressively, infiltrating surrounding brain structures and sometimes obstructing the 3rd ventricle



Age-dependent incidence rate of craniopharyngioma

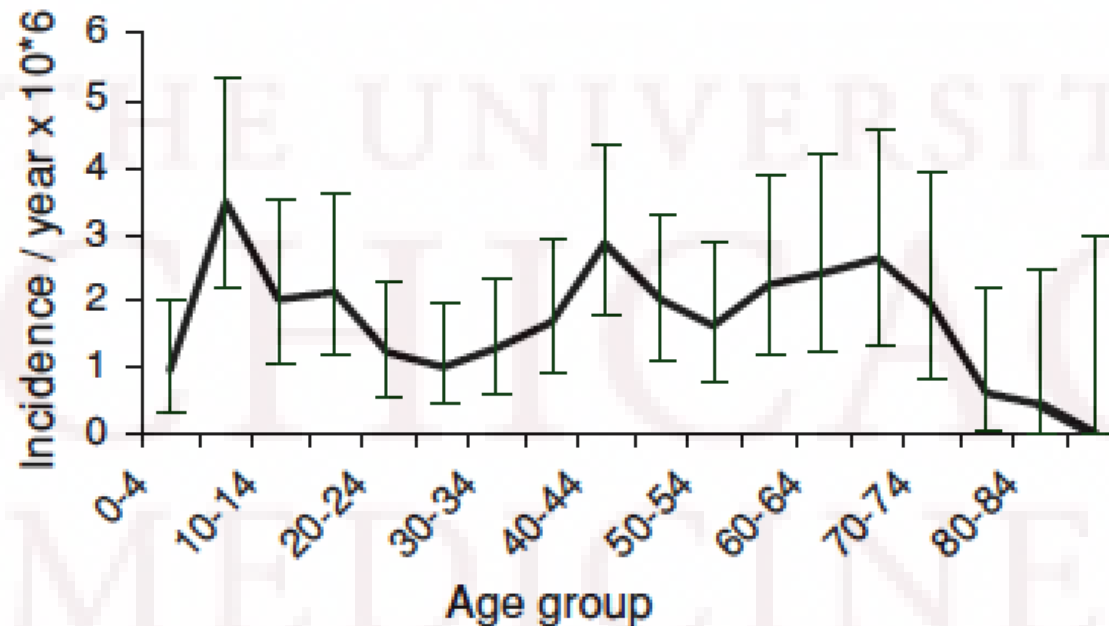


Fig. 1 Age-dependent incidence rates of craniopharyngioma in Denmark (men and women together) during the period 1985–2004. Observed incidence rates are depicted against 5-year age groups from 0 to 85+ years. *Whiskers* represent 95% confidence intervals



Are there differences in the endocrine manifestations of craniopharyngioma in children vs adults?



	Children (<i>n</i> = 41)	Adults (<i>n</i> = 78)	Total (<i>n</i> = 119)
Headaches	32 (78)*	44 (56)*	76 (64)
Menstrual disorders (adult women, <i>n</i> = 37)		21 (57)	
Visual field defects	19 (46)	47 (60)	66 (55)
Decreased visual acuity	16 (39)	31 (40)	47 (39)
Nausea/vomiting	22 (54)*	20 (26)*	42 (35)
Growth failure	13 (32)		
Poor energy	9 (22)	25 (32)	34 (29)
Impaired sexual function		22 (28)	
Impaired secondary sexual characteristics (patients aged ≥ 13 years, <i>n</i> = 91)			22 (24)
Lethargy	7 (17)	20 (26)	27 (23)
Other cranial nerves palsies	11 (27)*	7 (9)*	18 (15)
Polyuria/polydipsia	6 (15)	12 (15)	18 (15)
Papillo-oedema	12 (29)*	5 (6)*	17 (14)
Cognitive impairment (memory, concentration, orientation)	4 (10)	13 (17)	17 (14)
Anorexia/weight loss	8 (20)	6 (8)	14 (12)
Optic atrophy	2 (5)	11 (14)	12 (10)
Hemiparesis	3 (7)	1 (1)	4 (3)
Blindness	1 (3)	2 (3)	3 (3)
Meningitis	0 (0)	2 (3)	2 (2)

Children are more likely to present with headaches, nausea/vomiting, cranial nerve palsies, and papilledema; while the common presentation in adults is visual field deficits.

Data are presented as the number of patients, with the relevant percentages in parentheses.

**P* < 0.01 children compared to adults.



In a retrospective 40 year review at a hospital in Oxford...



Both children and adults present with pituitary abnormalities or..

Table 3. Pituitary function at presentation

	Children	Adults	Total
GH deficiency	15/15 (100)	6/7 (86)	21/22 (95)
FSH/LH deficiency		40/54 (74)	
ACTH deficiency	15/22 (68)	25/43 (58)	40/65 (62)
TSH deficiency	7/28 (25)	22/53 (42)	29/81 (36)
Hyperprolactinaemia*		24/44 (55)	
DI	7/32 (22)	12/72 (17)	19/104 (18)

Data are presented as the number of patients with the deficiency/total number of patients with available information, with the relevant percentages in parentheses.

*Median prolactin values (range) (mU/l): 1692 (160–3500) ($n = 15$ adult females); 388 (16–1539) ($n = 29$ adult males).



...develop them post-operatively

Table 6. Post-operative complications after gross total or partial removal

	Gross total removal	Partial removal	Total surgical procedures
DI (permanent or transient)	10/18 (56)	39/75 (52)	40/93 (43)
Cerebrospinal fluid (CSF) leak	2/18 (11)	4/75 (5)	6/93 (6)
Deep vein thrombosis	0/18 (0)	2/75 (3)	2/93 (2)
Deterioration of vision	1/18 (6)	5/75 (7)	6/93 (6)
Hemiparesis	0/18 (0)	5/75 (7)	5/93 (5)
Pulmonary embolism	1/18 (6)	1/75 (1)	2/93 (2)
Meningitis	0/18 (0)	3/75 (4)	3/93 (3)
Subdural fluid collection	0/18 (0)	2/75 (3)	2/93 (2)
Cranial nerve damage	0/18 (0)	2/75 (3)	2/93 (2)
ACTH deficiency (when pre-operatively normal)	2/4 (50)	13/17 (76)	15/21 (71)
TSH deficiency (when pre-operatively normal)	8/11 (73)	17/28 (61)	25/39 (64)
Peri-operative mortality*	0/19 (0)	2/84 (2)	2/112† (1.8)

Data are presented as the number of patients with the feature/total number of patients with available information, with the relevant percentages in parentheses.

*Causes of death: middle cerebral artery infarct and meningitis/respiratory failure.

†Includes the total number of patients who had surgical removal of the tumour.



Clinical Course

- Patient's respiratory failure thought to be multifactorial – perhaps reaction to contrast, but kyphoscoliosis, malnutrition, possible upper respiratory infection contributing



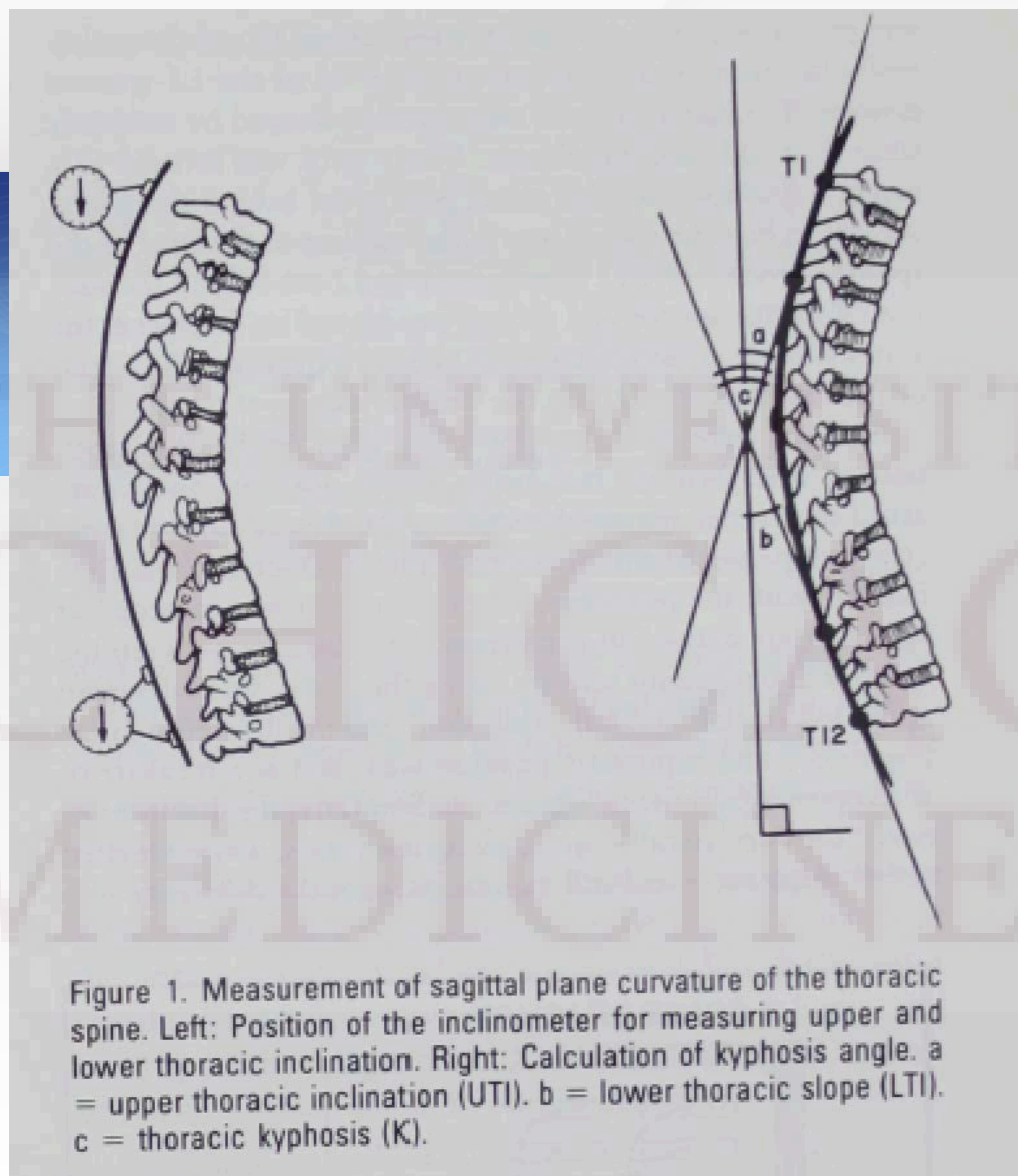
Kyphosis

- Clinic note from 02/2016: “Severe osteoporosis – she has refused to see Dr. Vokes in clinic, used to get Reclast but then stopped”
- Per notes, hadn’t been treated with pharmacological agents in at least 5 years



Kyphosis and Lung Function

- 74 women with osteoporosis had PFTs done
- Thoracic wedge fractures in 62% of these 74
 - 57% had 1 fracture, 31% had two fractures, six subjects with three fractures, ten had four fractures, one had five fractures, one had six fractures
- Cobb's angle (kyphosis angle) measured from x-rays



CRUSOP, MAYBELLE
MR# 2515072
F 5/27/1933
ACC# 15370302

MITT114 - UNIV. OF CHICAGO

Chest
9/7/2015
8:39:09

Angle of kyphosis

mAs 3
KVP 120 - mGy 0.145445
mA 419
mSec 6
EI_s
DI

S# 167,84
image 8:39:13

Zoom 32.3%
www.fwl 15073/8522



TABLE 3
PULMONARY FUNCTION TESTS*

	No Thoracic Fractures (n = 29)	One or Two Thoracic Fractures (n = 32)	Three or More Thoracic Fractures (n = 13)
Age, yr	65 ± 2 (48–79)	67 ± 2 (45–82)	70 ± 1 (63–80)
Arm span, cm	162 ± 1 (150–173)	163 ± 1 (150–173)	165 ± 2 (154–177)
Arm span minus height, cm	2.3 ± 0.3 (–0.5–5)	2.7 ± 0.3 (–1–5.7)	5.3 ± 0.4 (2.5–7.8)
Flow rates			
FVC, %*	95 ± 3 (68–127)	90 ± 3 (55–131)	68 ± 3 (52–93)
FEV ₁ , %	97 ± 3 (57–129)	92 ± 3 (61–134)	68 ± 3 (52–93)
FEV ₁ /FVC, %	80 ± 1 (55–92)	80 ± 1 (65–100)	80 ± 1 (74–86)
FEF _{25–75} , %	114 ± 7 (25–180)	102 ± 6 (42–235)	83 ± 5 (64–121)
Volumes			
TLC, %	99 ± 3 (68–128)	94 ± 3 (62–128)	75 ± 3 (61–89)
FRC, %	90 ± 3 (57–122)	88 ± 3 (57–137)	68 ± 3 (49–84)
ERV, %	58 ± 4 (22–106)	54 ± 5 (11–151)	26 ± 5 (2–62)
IC, %†	113 ± 4 (76–181)	103 ± 4 (50–165)	84 ± 5 (64–121)
Pressures			
MIP, cm H ₂ O	54 ± 4 (10–95)	52 ± 4 (20–100)	41 ± 4 (10–60)
MEP, cm H ₂ O	44 ± 3 (20–85)	46 ± 4 (15–90)	47 ± 4 (20–70)
Diffusing capacity			
DL _{COsb} , %†	85 ± 3 (56–128)	78 ± 3 (42–114)	68 ± 5 (43–103)
DL/VA, %	106 ± 5 (79–165)	98 ± 5 (58–155)	115 ± 7 (86–159)

* Values are mean ± 1 SEM (minimum–maximum).

† p value less than 0.005 for two-tailed, unpaired t test comparing subjects without fractures (Column 1) to subjects with fractures (Columns 2 and 3).

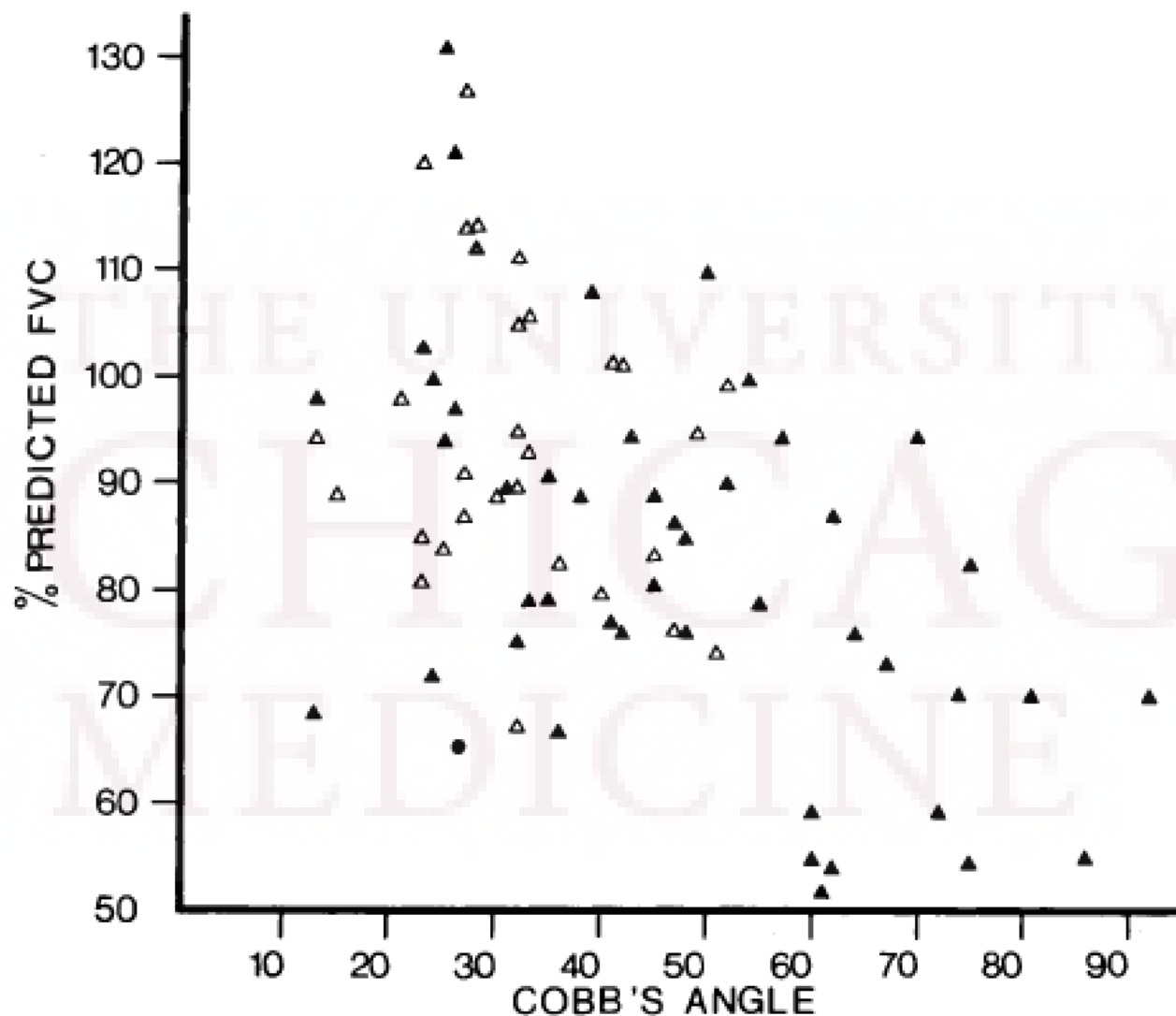


Fig. 1. Relationship of hyperkyphosis to forced vital capacity (closed triangles = subjects with vertebral fractures; open triangles = subjects without fractures).



Clinical Course

- Patient's family feels patient would not want prolonged intubation and patient was extubated
- She passed away shortly thereafter



References

- Nielsen. Incidence of craniopharyngioma in Denmark and estimated world incidence of craniopharyngioma in children and adults. J Neurooncol 2011;104:755-63.
- Karavitaki. Craniopharyngioma in children and adults: systematic analysis of 121 cases with long term follow up. Clinical Endocrinology 2005;62:397-405.
- Scow et al. Ketogenic action of pituitary and adrenal hormones in pancreatectomized rats. Diabetes 1960;8(2):132-142.
- Leech et al. Relationship of lung function to severity of osteoporosis in women. Am Rev Respir Dis 1990;141:68-71
- Culham et al. Thoracic kyphosis, rib mobility, and lung volumes in normal women and women with osteoporosis. Spine 1994;19(11):1250-55.