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Images of Endocrine Disorders

M2 - Endocrinology Sequence
A. Kumagai & T. Giordano

NOTE: BEST VIEWED AS SLIDE SHOW

Winter 2009



Images of Endocrine Disorders

Because endocrine disorders are manifested by unusual and varied clinical findings, diagnosis often involves developing a “gestalt”--an overall picture of the individual with a possible endocrine disorder--and matching of this picture with characteristic clinical features.

The purpose of the following photographs is to give you a “gallery” of these characteristic features to help you to remember elements of several different disease processes. The material is meant to reinforce information provided in lectures, handouts and discussion groups (and hopefully to have some fun while doing it.) Please refer to required materials for details.

Endocrine Images: Acromegaly



 [Andre the Giant](#) by EKavet (Flickr)



 acromegaly.org.uk

Picture of wrestling star Andre the Giant and Skull X-ray of man with acromegaly. Notice the characteristic prominent supraorbital ridge (“frontal bossing”), large jaw, and dental malocclusion with underbite (x-ray).

Endocrine Images: Acromegaly



© FAIR USE Greenspan & Stewler, *Basic & Clinical Endocrinology*, 5th Ed., 1997 From Reichlin S. Acromegaly. Med Grand Rounds 1982;1:9

Individual with acromegaly photographed over a 37-year span. Ages in years are in lower left corner of each photograph.

Note that the changes occurring with acromegaly may be very gradual and go completely undetected by the patient or his or her family for many years. It is often only through the comparison with old photographs or complaints involving complications of acromegaly, such as sleep apnea, diabetes or dental problems that acromegaly is suspected.

Endocrine Images: Acromegaly



© PD-INEL University of Iowa Dept. of Dermatology

Hands of individual with acromegaly (left) compared to hand of non-acromegalic adult (far right).

Endocrine Images: Acromegaly



Foot X-ray of Patient with Acromegaly.
Notice the unusually thick “pad” of soft tissue overlying the calcaneus (double arrow). It is said that a good clinical sign of acromegaly is the inability to feel the calcaneus when pressing on the heel.

Endocrine Images: Acromegaly



Clinical Findings in Acromegaly.

Symptoms & Signs:

- Excessive sweating, snoring.
- Arthralgias, carpal tunnel syndrome.
- Change in ring/glove or shoe size.

Signs:

- Dental malocclusion and widely spaced teeth.
- Macroglossia.
- Large hands and feet.
- Large heart (may see signs of heart failure).

Laboratory results:

- Impaired glucose tolerance or diabetes.
- Elevated IGF-1.
- Enlarged cardiac silhouette on chest x-ray.

Endocrine Images: Graves Disease



© PD-INEL | The Handbook of Ocular Disease Management.

Graves Ophthalmopathy (Exophthalmos).

Graves ophthalmopathy is due to autoimmune-mediated inflammation and edema of the extraocular muscles. Graves eye disease may be asymmetrical and often progresses independently of hyperthyroidism and may lead to diplopia, corneal dryness, ulceration, and blindness. Severe cases may require surgical decompression. Exophthalmos is specific to Graves disease. On the other hand, “lid lag,” in which the eyelids do not closely follow downward gaze, may be seen in all forms of hyperthyroidism and is due to hyperstimulation of the orbicularis oculi muscles.

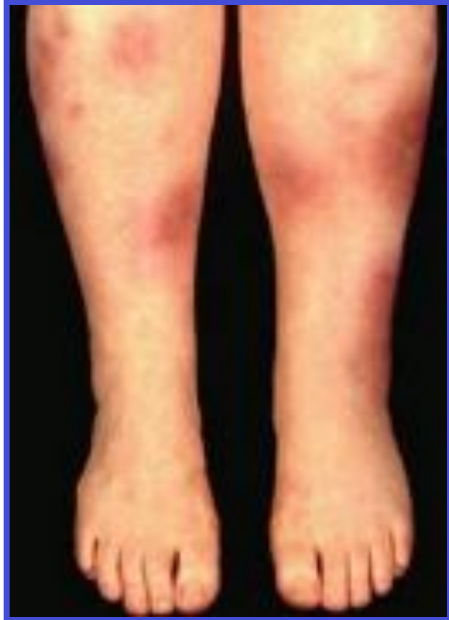
Endocrine Images: Graves Disease

This photo was taken from Dr. Koenig's thyroid lecture and is meant to highlight the eye findings in Graves disease: the classic "stare" of hyperthyroidism and a prominent goiter. Notice in Graves that the thyroid is symmetrically enlarged and "plump." This is because the entire thyroid is being stimulated by *thyroid stimulating immunoglobulin* (TSI), which causes constitutive activation of the TSH receptor in the absence of TSH. Auscultation of the goiter of an individual with active Graves disease may reveal a *thyroid bruit*, due to the hypervascularity of the overactive gland. This bruit must be distinguished from cardiac (or carotid) bruits by localizing its source over the thyroid.



© FAIR USE Source Undetermined

Endocrine Images: Graves Disease



© PD-INEL Dermnet

Graves Dermopathy

Graves dermopathy is also known as “pretibial myxedema,” which is an unfortunate term, since “myxedema” usually refers to *hypothyroidism*. The term “myxedema” describes the “doughy” or “*peau d’orange*” texture of the skin. Graves dermopathy involves inflammation and mucopolysaccharide deposition most prominently in the pretibial regions of the legs. It is a relatively uncommon--albeit, classic-- finding in Graves disease and affects approximately 5% of patients with Graves.

Endocrine Images: Graves Disease



© FAIR USE Source Undetermined

Clinical Findings in Graves Disease.

Symptoms & Signs:

- Heat intolerance, excessive sweating.
- Anxiety, “hyperkinesis.”
- Sleep disturbances.
- Weight loss *despite* increased appetite.
- Hyperdefecation (not diarrhea).

Signs:

- Tachycardia, wide pulse pressure.
- Warm, moist skin.
- Exophthalmos may be present.
- Symmetrical, “plump” goiter.
- Fine tremor of outstretched hands.
- Brisk reflexes.

Endocrine Images: Hypothyroidism



© PD-INEL
University of
Missouri Health
Systems

Child with Congenital
Hypothyroidism (cretinism)



© PD-INEL

Greenspan & Strewler, *Basic
& Clinical Endocrinology*, 5th
Ed., 1997

Woman with Severe
Hypothyroidism

This pair of photographs illustrates some general physical features of congenital hypothyroidism and severe hypothyroidism in an adult. The face has a puffy, “doughy” appearance (hence, the term “myxedematous”). Periorbital edema may be present. The skin is dry and cool, and the hair is coarse. The affect is blunted and apathetic. The child is short and has mental retardation.

Endocrine Images: Hypothyroidism



Woman with Severe Hypothyroidism

Clinical Findings in Hypothyroidism.

Symptoms & Signs:

- Depression.
- Cold intolerance.
- Weight gain *despite* unchanged appetite.
- Constipation.

Signs:

- Bradycardia, diastolic hypertension.
- “Myxedematous facies” with coarse hair.
- Distant heart sounds.
- Delayed relaxation phase of achilles reflex.

Laboratory results:

- Anemia: either macrocytic or normocytic.
- Hyponatremia (due to decreased free water clearance by the kidney).
- Elevated TSH, low free T4 (primary hypothyroidism). [Note: since free T3 may remain normal until hypothyroidism is severe it is useless in the diagnosis of hypothyroidism.]

Endocrine Images: Cushings Syndrome



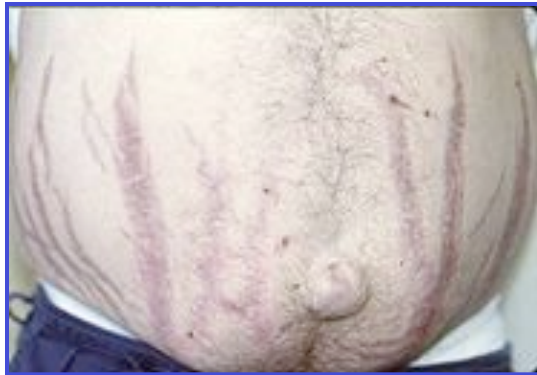
© PD-INEL Mt. Zion-UCSF



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Prominent physical findings in Cushing's syndrome include round “moon facies,” supraclavicular and supracerical fat pads (“buffalo hump”), central obesity and purple abdominal striae. If the result of a pituitary adenoma (Cushing's Disease), hyperpigmentation may be present. If an adrenal cortical carcinoma is the cause, there may be hirsutism and virilization. (Adrenal carcinomas may produce DHEA sulfate, a potent adrenal androgen.) Adrenal carcinomas also grow more rapidly than adrenal adenomas and tend to be larger: almost always > 5 cm in diameter on an abdominal CT scan.

Endocrine Images: Cushings Syndrome



Abdominal Striae in Cushings Syndrome.

Classically, these striae are purplish in color and appear on the abdomen, thighs, upper arms and axillae. They are distinguished from silver striae seen in postpartum women or pink striae seen with significant weight loss.

Excessive steroid action on skin also may lead to skin fragility and easy bruising during routine activities.

Endocrine Images: Adrenal Insufficiency



© PD-INEL NEJM 337:1666, 1997

This slide of identical twins is from Dr. Hammer's lecture and is meant to emphasize the hyperpigmentation and thin body habitus that is often seen in primary adrenal insufficiency (the woman with adrenal insufficiency is on the right). Hyperpigmentation may also be seen in the extensor surfaces of the limbs (knuckles, elbows, knees), in newly formed scars and in palmar creases and buccal mucosa. (What's the cause?)

Endocrine Images: Addison's Disease



© PD-INEL NEJM 337:1666, 1997

Clinical Findings in Addison's Disease.

Symptoms & Signs:

- General malaise, fatigue.
- Weakness and difficulty climbing stairs, arising from sitting, combing or shampooing hair.
- Salt craving.

Signs:

- Orthostatic hypotension.
- Hyperpigmentation of extensor surfaces of skin, buccal mucosa, palmar creases.
- Weakness of proximal muscle groups.

Pertinent routine laboratory results:

- Normocytic anemia
- Neutropenia (mild) with eosinophilia.
- Hyponatremia, hypokalemia and “non-gap” metabolic acidosis.
- Mild hypoglycemia (may be pronounced in infants).

Endocrine Images: Addison's Disease



© PD-INEL Williams Textbook of Endocrinology, 8th Ed, 1996.

Hyperpigmentation in Addison's Disease.

In primary Addison's disease, one often sees hyperpigmentation of extensor surfaces of the limbs (knuckles, elbows, knees), of the areolae of the breasts, of newly formed scars, and of the buccal mucosa. In this photograph, one may see darkening of the face, fingertips and gingiva as well. (What's the mechanism?)

Endocrine Images: Addison's Disease



© PD-EXP

T. Addison "On the constitutional and local effects of disease of the suprarenal capsules" 1855

Hyperpigmentation in Addison's Disease.

This is a (presumably) postmortem drawing from Addison's original paper of an individual with primary adrenal insufficiency. In Addison's day, the primary cause was not autoimmune adrenalitis, but tuberculosis.

Endocrine Images: Addison's Disease

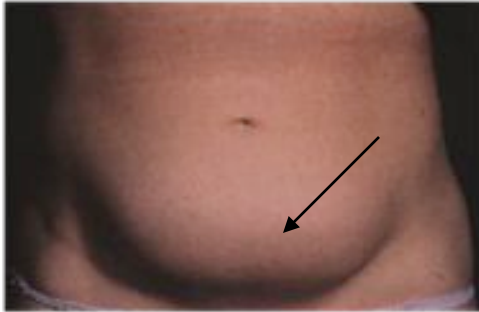


 PD-EXP James Andrews of Maidenhead

Jane Austen (1775-1817)

The great British novelist Jane Austen also suffered from Addison's disease and died prematurely of its complications. If you look closely, you can see areas of hyperpigmentation on her cheeks...but again, this might be the product of an over-worked endocrinologist's imagination...

Endocrine Images: Lipodystrophy in Diabetes



Lipohypertrophy (arrow) in individual who injects insulin predominantly in lower abdomen.

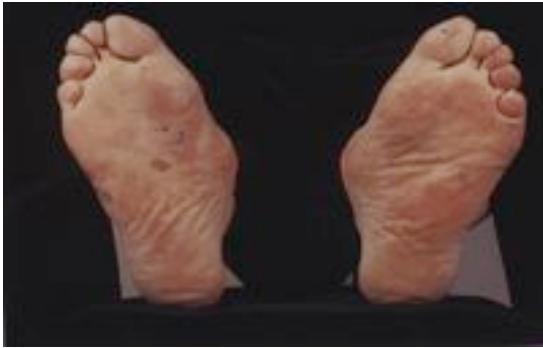


Lipoatrophy in buttocks and upper thighs (arrows) in individual with type 1 DM

Lipodystrophy (lipohypertrophy and lipoatrophy) may be seen as a side effect of insulin therapy.

- Lipohypertrophy is common and occurs in areas of frequent insulin injections. It is caused by hyperplasia and hypertrophy of subcutaneous fat from prolonged exposure to high insulin concentrations and may affect insulin absorption and action. Lipohypertrophy may be seen in individuals with type 1 or type 2 diabetes.
- Lipoatrophy is much less common (especially with the current use of recombinant human insulins) and is seen in individuals with type 1 diabetes. Its cause appears to be an autoimmune reaction and is characterized by complement deposition in subcutaneous tissue.
- Generalized lipoatrophic syndromes are rare and may occur independently from insulin-treated diabetes.

Endocrine Images: Foot Problems in Diabetes




Diabetic “Charcot Feet” with bone abnormalities



Diabetic Foot Ulcer



Gangrene of the First and Fifth Toes

 Source Undetermined (All Images)

Endocrinologists spend a great deal of time looking at people’s feet. Foot problems are very common in diabetes and may result from diabetic sensory neuropathy, a lack of normal sweat response and dry feet (from compromised sweat gland innervation), and poor circulation from peripheral vascular disease. Sensory neuropathy leading to permanently “numb” or “insensate” feet predispose the feet to unrecognized trauma and abnormal weight-bearing. This in turn may lead to cracks, fissures, and ulcers or the development of so-called “Charcot Feet,” which involve bony changes and gradual, severe skeletal deformation. Ulcers may be very slow to heal and if deep, may lead to osteomyelitis, cellulitis and gangrene.

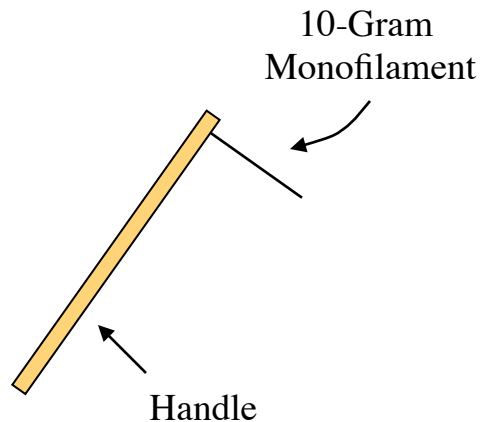
Remember: Diabetes is the leading cause of non-traumatic lower extremity amputation in the United States.

Endocrine Trivia: Diabetic Feet



© PD-INEL Source Undetermined
Diabetic “Charcot Feet”

The term “Charcot feet” used to describe bony deformation in diabetes comes from the great French neurologist (and Sigmund Freud’s former professor) Dr. Jean-Martin Charcot of the Hôtel Dieu Hospital in Paris. Charcot originally described similar lower extremity changes in another disease...tabes dorsalis associated with neurosyphillis....



© PD-INEL A. Kumagai

In addition to a 128-Hz tuning fork, a 10-gram monofilament (similar to a straight piece of fishing line) is frequently used to assess the severity of diabetic peripheral neuropathy. Failure of the patient to feel the touch of the filament is associated with a significantly increased risk of developing foot ulcers.

This instrument was actually originally developed to assess the peripheral neuropathy seen in another disease... “Hansen’s Disease” or leprosy...

Endocrine Images: Diabetes



© PD-INEL University of Iowa Dermatology

Necrobiosis lipodica diabetacorum.

Indurated, nontender ulcerations of the lower extremities occasionally seen in individuals with type 1 diabetes.

A Gallery of
Endocrine Images:
Famous Names in Endocrinology

Famous Names in Endocrinology

Acromegaly

- Robert Wadlow, the “Alton Giant” 1918-1940

Robert Wadlow, the “Alton Giant” is said to be the tallest human in history, stood at 8’ 11 ½” and died at age 22 from an infected leg ulcer. He was very spiritual, was a Boy Scout, and briefly attended college until his death.

- Lurch of the Original Addams Family
- Andre the Giant
- “Jaws” of the James Bond Movie Fame

Images of Robert
Wadlow, Lurch,
Andre the Giant,
and “Jaws”
removed

Endocrine Images: Addison's Disease

**1960 Presidential Debate: John F. Kennedy vs.
Richard M. Nixon, Chicago, Ill., September 21, 1960**



 [The Kennedy-Nixon debate in 1960](#) by scriptingnews (flickr)

In the first-ever televised presidential debate, John F. Kennedy was the apparent winner over Richard M. Nixon, a win which helped him in his narrow victory over Nixon in the presidential election of November, 1960. Many observers attributed Kennedy's "telegenic" character to his youthful, dynamic, *tanned* (i.e., "hyperpigmented") appearance...

Endocrine Disorders and World History

Marshall Josip “Broz”
Tito of Yugoslavia and
US President John F.
Kennedy, 1962.



 PD-GOV [Yugoslav Government](#)

Endocrine disease has clearly affected the course of world history. Kennedy's year-around "tan" (from his Addison's disease) helped him win the presidency and lent a youthful air to "Camelot," as the Kennedy White House was known, whereas Tito's death from complications from type 2 diabetes in 1980 eventually led to the break-up of the Yugoslavian federation and the bloody Balkan wars and "ethnic cleansing" of the 1990's.

Famous Names in Endocrinology


Images of Marty
Feldman and Gene
Wilder removed. Poster
from the movie *Young
Frankenstein* removed.

Graves Disease

Marty Feldman, star of a series of classic movies by Mel Brooks had Graves disease. Hint: Feldman is the guy on the right. The man on the left is Gene Wilder. He has no endocrine disorder but is just pretty wacky...

Famous Names in Endocrinology



 U.S. Navy, ([wikimedia commons](#))

Graves Disease


Both Bushes were diagnosed with Graves disease: Barbara had Graves ophthalmopathy and George presented with atrial fibrillation. Their dog, Millie, had lupus. No kidding. Must be the water...

Famous Names in Endocrinology



 PD-GOV Cecil Stoughton, White House




 PD-EXP James Andrews of Maidenhead,
1870

Addison's Disease

We now all know about John F. Kennedy, but the novelist Jane Austin was also afflicted with adrenal insufficiency. Her Addison's disease worsened as she grew older, and she finally succumbed to it at the age of 41 in Winchester, in Central Hamshire (UK) in 1817.

Famous Names in Endocrinology



 University of Toronto Archives
Frederick Banting (right) and Charles Best (left),
University of Toronto, 1922.

Type 1 Diabetes

The beleaguered looking beagle is one of several dogs whose pancreatectomies were instrumental in experiments leading to the discovery of insulin in 1922.

Famous Names in Endocrinology

- Mary Tyler Moore
- 1999 Miss America Nicole Johnson
- 1996 Atlanta Olympic Gold Medalist Gary Hall, Jr.

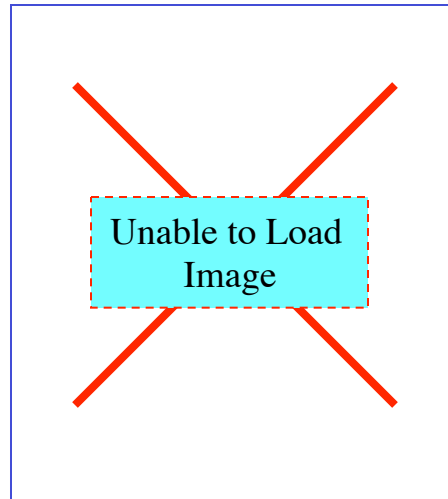


Images of Mary
Tyler Moore,
Nicole Johnson,
and Gary Hall
removed

Type 1 Diabetes: Recent

Both actress Mary Tyler Moore and the 1999 Miss America, Nicole Johnson, have type 1 diabetes. Both women have done much to publicize the issue of diabetes awareness in general, and of type 1 diabetes in particular. Gary Hall, Jr. won gold and silver at the 1996 Summer Olympic Games in Atlanta.

Famous Names in Endocrinology



Type 1 Diabetes: Before 1922

A “trick” question, since before the invention of insulin, no one with type 1 diabetes lived long enough to become famous.....

Famous Names in Endocrinology



© PD-GOV Eric Draper, White House



© PD-INEL [Carl Van Vechten](#)

Type 2 Diabetes

We now all know about B.B. King, but the jazz great Ella Fitzgerald also had type 2 diabetes. Ms. Fitzgerald suffered from neuropathy and peripheral vascular disease, which necessitated lower extremity amputation prior to her death...We miss you Ella...

Additional Source Information

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Slide 5: CC: BY-SA [Andre the Giant](#) by Ekavet, Flickr, <http://creativecommons.org/licenses/by-sa/2.0/deed.en>; <http://www.acromegaly.org.uk/>

Slide 6: Greenspan & Strewler, *Basic & Clinical Endocrinology*, 5th Ed., 1997 From Reichlin S. Acromegaly. Med Grand Rounds 1982;1:9

Slide 7: University of Iowa Dept. of Dermatology

Slide 8: Amilcare Gentili, M.D., <http://www.gentili.net/>

Slide 9: Greenspan & Strewler, *Basic & Clinical Endocrinology*, 5th Ed., 1997 From Reichlin S. Acromegaly. Med Grand Rounds 1982;1:9

Slide 10: The Handbook of Ocular Disease Management.

Slide 11: Source Undetermined

Slide 12: Dermnet, <http://www.dermnetnz.org>

Slide 13: Source Undetermined

Slide 14: University of Missouri Health Systems, <http://www.hsc.missouri.edu>; Greenspan & Strewler, *Basic & Clinical Endocrinology*, 5th Ed., 1997

Slide 15: Greenspan & Strewler, *Basic & Clinical Endocrinology*, 5th Ed., 1997

Slide 16: Mt. Zion-UCSF; Source Undetermined

Slide 17: G. Hammer, MD, PhD University of Michigan (Both images)

Slide 18: *NEJM* 337:1666, 1997

Slide 19: *NEJM* 337:1666, 1997

Slide 20: Williams Textbook of Endocrinology, 8th Ed, 1996.

Slide 21: T. Addison “*On the constitutional and local effects of disease of the suprarenal capsules*” 1855

Slide 22: James Andrews of Maidenhead

Slide 23: Pickup & Williams, 1991 (Both images)

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Slide 33: Cecil Stoughton, White House; James Andrews of Maidenhead, 1870

Slide 34: University of Toronto Archives

Slide 37: Eric Draper, White House; Carl Van Vechten, <http://commons.wikimedia.org/wiki/File:YoungElla.jpg>