

Patho Questions – Part 1

31-year-old woman, who has two healthy children, notes that she has had no menstrual periods for the past 6 months, but she is not pregnant and takes no medications. Within the past week, she has noted some milk production from her breasts. She has been bothered by headaches for the past 3 months. After nearly hitting a bus while changing lanes driving her vehicle, she is concerned with her vision. An optometrist finds her lateral vision to be reduced. On physical examination she is afebrile and normotensive. Which of the following laboratory test findings is most likely to be present in this woman?

- A Increased serum cortisol
- B Lack of growth hormone suppression
- C Increased serum alkaline phosphatase
- D Hyperprolactinemia
- E Hyponatremia
- F Abnormal glucose tolerance test
- G Decreased serum TSH

Ans: D

(D) CORRECT. The most common mass lesion of the pituitary in an adult is an adenoma that secretes prolactin, and this explains the amenorrhea-galactorrhea that she has been experiencing. A large sellar mass can compress the optic chiasm to produce bitemporal hemianopsia.

A 28-year-old woman has had difficulty concentrating at work for the past month. She is constantly getting up and walking around to visit co-workers. She complains that the work area is too hot. She seems nervous and often spills her coffee. She has been eating more but has lost 5 kg in the past 2 months. On physical examination her temperature is 37.5°C, pulse 101/minute, respiratory rate 22/minute, and blood pressure 145/85 mm Hg. Which of the following laboratory findings is most likely to be present in this woman?

- A Decreased catecholamines
- B Decreased iodine uptake
- C Decreased plasma insulin
- D Decreased TSH
- E Increased ACTH
- F Increased calcitonin

Ans: D

(D) CORRECT. She has Graves disease with hyperthyroidism. There are both thyroid-stimulating immunoglobulins (TSI) and thyroid growth-stimulating immunoglobulins (TGI) in Graves disease. The amount of thyroid hormone production goes up, suppressing TSH secretion from the pituitary. The diffusely enlarged thyroid gland is double to triple in size, which is still difficult to appreciate on physical examination.

A 19-year-old previously healthy woman has had a mild pharyngitis followed by a high fever over the past 24 hours. When seen in the emergency room, her skin now shows extensive areas of purpura. Vital signs include temperature 39°C, pulse rate 102/minute, respiratory rate 21/minute, and blood pressure 80/55 mm Hg. Laboratory studies show a serum sodium of 115 mmol/L, potassium 5.3 mmol/L, chloride 92 mmol/L, CO₂ 22 mmol/L, glucose 42 mg/dL, and creatinine 1.1 mg/dL. Which of the following is the most likely diagnosis?

- A Idiopathic adrenalitis
- B Disseminated tuberculosis
- C Reactive systemic amyloidosis
- D Sheehan syndrome
- E Meningococcemia
- F Hemochromatosis

Ans: E

(E) CORRECT. This is acute adrenal insufficiency marked by hyponatremia, hyperkalemia, and hypoglycemia. Infection with *Neisseria meningitidis* can produce the Waterhouse-Friderichsen syndrome, complicated by disseminated intravascular coagulopathy.

A 40-year-old woman has noted enlargement of her anterior neck region over the past 8 months. On physical examination her vital signs include T 36.8°C, P 64/minute, RR 16/minute, and BP 155/105 mm Hg. There is diffuse, symmetrical thyroid enlargement without tenderness. A chest radiograph is normal. Fine needle aspiration of the thyroid yields cells consistent with a neoplasm. Laboratory studies show that she is euthyroid, but her serum ionized calcium is elevated. She is taken to surgery and frozen sections of several thyroid masses show a malignant neoplasm composed of polygonal cells in nests. A thyroidectomy is performed. Immunostaining for calcitonin of the permanent sections is positive, and the neoplasm has an amyloid stroma with Congo red staining. Which of the following neoplasms is she most likely to have?

- A Anaplastic carcinoma
- B Medullary carcinoma
- C Papillary thyroid carcinoma
- D Metastatic renal cell carcinoma
- E Parathyroid carcinoma
- F Follicular carcinoma

Ans: B

(B) CORRECT. She has MEN IIa, with medullary thyroid carcinomas (often multiple when familial), parathyroid hyperplasia, and pheochromocytoma.

A 37-year-old man experiences abdominal pain, nausea, and constipation for the past 3 days. On physical examination he has no palpable abdominal masses and bowel sounds are present. His lungs are clear to auscultation. He has a heart rate of 80/min with an irregular rhythm. An electrocardiogram demonstrates a shortened QT(corrected) interval and a prolonged PR interval. He has a stool positive for occult blood. Upper GI endoscopy reveals multiple 1 cm diameter shallow ulcerations of the gastric antrum. Which of the following laboratory test findings is most likely to be present in this man?

- A Thyroid peroxidase antibody of 4 IU/mL
- B Serum calcium of 12.4 mg/dL
- C Blood glucose of 225 mg/dL
- D Total serum thyroxine of 21 ng/mL
- E Plasma cortisol of 45 microgm/dL at 8 am
- F Urine normetanephrine of 692 microgm/gm of creatinine
- G Plasma renin activity (upright) of 6.8 ng/mL/hr

Ans: B

(B) CORRECT. He most likely has a parathyroid adenoma secreting excessive parathormone to increase serum calcium and decrease serum phosphorus. The hypercalcemia leads to increased gastrin production and peptic ulcer disease. Hypercalcemia produces cardiac arrhythmias (or asystole).

A 55-year-old woman has had a 4 kg weight loss over the past 3 months. She exhibits decreased mentation over the past 10 days. On physical examination she is afebrile and hypotensive. Bilateral papilledema is noted. A head CT scan shows marked diffuse cerebral edema with effacement of the lateral ventricles. Laboratory studies show a sodium of 108 mmol/L, potassium 4.0 mmol/L, chloride 83 mmol/L, CO₂ 14 mmol/L, glucose 82 mg/dL, and creatinine 0.5 mg/dL. Which of the following is most likely to cause these findings?

- A Small cell lung carcinoma
- B Blunt head trauma
- C Hypothalamic glioma
- D Meningitis
- E Pituitary macroadenoma

Ans: A

(A) CORRECT. A paraneoplastic syndrome is the most frequent cause for the syndrome of inappropriate ADH (SIADH) leading to her pronounced hyponatremia from lack of free water clearance. Paraneoplastic syndromes are often seen with small cell carcinomas of the lung.

A 29-year-old primigravida who received no prenatal care has marked vaginal bleeding after the onset of labor at 38 weeks gestation. Cesarean section is performed and a lacerated low-lying placenta is removed. She remains hypotensive for 6 hours and requires transfusion of 12 packed RBC units. Postpartum, she becomes unable to breast-feed the infant. She does not have a resumption of normal menstrual cycles. She becomes more sluggish and tired. Laboratory findings include hyponatremia, hyperkalemia, and hypoglycemia. Which of the following pathologic lesions is she most likely to have had following delivery?

- A Bilateral adrenal hemorrhage
- B Pituitary necrosis
- C Subacute thyroiditis
- D Metastatic choriocarcinoma
- E Insulinitis

Ans: B

(B) CORRECT. She has Sheehan syndrome from post-partum anterior pituitary necrosis, leading to loss of pituitary hormones, including gonadotrophic hormone deficiency. The pituitary enlarges in pregnancy, which makes its blood supply more tenuous, and the pituitary is more susceptible to necrosis from events that lead to hypotension.

A 58-year-old man with a history of diabetes mellitus has noted the presence of bone pain, especially of his hands, for the past 6 months. On physical examination there is no swelling or redness of his hands, no joint deformity, but the range of motion is slightly decreased. Laboratory studies show sodium 139 mmol/L, potassium 4.0 mmol/L, chloride 98 mmol/L, CO₂ 22 mmol/L, glucose 153 mg/dL, creatinine 7.8 mg/dL, calcium 7.8 mg/dL, phosphorus 5.7 mg/dL, total protein 6.2 g/dL, and albumin 4.0 g/dL. Which of the following conditions is this man most likely to have?

- A Adrenal adenoma
- B Medullary thyroid carcinoma
- C Extra-adrenal pheochromocytoma
- D Parathyroid hyperplasia
- E Pituitary adenoma

Ans: D

D CORRECT. He has secondary hyperparathyroidism from chronic renal failure. Renal failure with retention of phosphorus drives the calcium down and parathormone secretion up, leading to osteitis fibrosa cystica and bone pain.

A 49-year-old woman has had increasing cold intolerance, weight gain of 4 kg, and sluggishness over the past two years. A physical examination reveals dry, coarse skin and alopecia of the scalp. Her thyroid is not palpably enlarged. Her serum TSH is 11.7 mU/L with thyroxine of 2.1 micrograms/dL. A year ago, anti-thyroglobulin and anti-microsomal autoantibodies were detected at high titer. Which of the following thyroid diseases is she most likely to have?

- A DeQuervain disease
- B Papillary carcinoma
- C Hashimoto thyroiditis
- D Multinodular goiter
- E Graves disease

Ans: C

(C) CORRECT. Hashimoto thyroiditis is the most common cause for hypothyroidism in adults. Though the thyroid may initially have been painlessly enlarged, over time the inflammation leads to atrophy of the thyroid with hypothyroidism. Anti-thyroid autoantibodies are helpful in establishing the diagnosis.

A clinical study is performed with subjects who were diagnosed with hyperthyroidism, compared with a control group of subjects who were euthyroid. The pathologic findings in the thyroid glands of these subjects are analyzed to determine the spectrum of disease processes present. Which of the following pathologic processes is most likely to be found with equal frequency in both the study and the control subjects?

- A Subacute granulomatous thyroiditis
- B Multinodular goiter
- C Medullary carcinoma
- D Hashimoto thyroiditis
- E Follicular adenoma

Ans: C

(C) CORRECT. Medullary carcinomas, derived from interstitial 'C' cells, do not secrete thyroid hormone and are not associated with hyperthyroidism.

A 48-year-old woman has experienced constant back pain exacerbated by movement over the past month. She reports increasing weakness over the past 3 months. On physical examination her blood pressure is 165/110 mm Hg. She is overweight, with a BMI of 28. A radiograph of the spine reveals a compressed fracture at T10. Laboratory findings include a serum glucose of 155 mg/dL. Which of the following pathologic lesions is most likely to explain her findings?

- A Adrenal cortical carcinoma
- B Anaplastic thyroid carcinoma
- C Empty sella syndrome
- D Pheochromocytoma
- E Multinodular goiter

Ans: A

(A) CORRECT. She has Cushing syndrome with osteoporosis, hypertension, obesity, and diabetes mellitus. Many adrenal cortical carcinomas function and can produce excess cortisol.

A 33-year-old woman has noted a weight gain of 6 kg over the past year. She has normal menstrual periods. On physical examination her blood pressure is 170/105 mm Hg. Her skin shows marked plethora. Abdominal striae are present. A serum electrolyte panel shows sodium 141 mmol/L, potassium 4.4 mmol/L, chloride 100 mmol/L, CO₂ 25 mmol/L, glucose 181 mg/dL, and creatinine 1.0 mg/dL. Which of the following radiologic findings would you most expect to be present in this patient?

- A 2 cm right adrenal mass with abdominal CT scan
- B 4 cm mass at aortic bifurcation with MR imaging
- C Multiple pulmonary nodules on chest radiograph
- D 10 cm cystic right ovarian lesion by abdominal ultrasound
- E 2 cm 'hot' thyroid nodule with Tc99 scintigraphic scan

Ans: A

کشتق

An 35-year-old woman has had insomnia for the past 4 months, as well as episodes of diarrhea with up to 4 loose stools per day. On physical examination, she exhibits bilateral proptosis. Her outstretched hands have a fine tremor. On palpation of her neck, the thyroid gland does not appear to be enlarged and no masses are palpable. Laboratory studies show a serum TSH of 8.8 microU/mL in association with a serum total thyroxine of 15.1 microgram/dL. Which of the following is the most likely diagnosis?

- A Graves disease
- B Pituitary adenoma
- C Chronic thyroiditis
- D Prior thyroidectomy
- E Multinodular goiter

Ans: B

Both TSH + T3,T4 are high

A 25-year-old woman has had a 7 kg weight loss over the past 6 months without dieting or trying to lose weight. On physical examination she appears anxious and worried. Her hands are warm and tremulous. Vital signs show her temperature to be 37.4°C, pulse 105/minute, respirations 23/minute, and blood pressure 135/75 mm Hg. Serum laboratory data include glucose 78 mg/dL and creatinine 0.8 mg/dL. Which of the following additional laboratory test findings is most likely to be present in this woman?

- A ☐ Plasma cortisol of 40 microgm/dL at 8 am
- B ☐ Serum antinuclear antibody of 1:256
- C ☐ Urinary free catecholamines of 500 microgm/24 hr
- D ☐ Serum gastrin of 200 pg/mL
- E ☐ Serum total thyroxine of 14 microgm/dL

Ans: E

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- B Serum antinuclear antibody of 1:256
- C Urinary free catecholamines of 500 microgm/24 hr
- D Serum gastrin of 200 pg/mL
- E Serum total thyroxine of 14 microgm/dL

Ans: E

A 50-year-old man has episodic headaches for 3 months. On physical examination his blood pressure is 185/110 mm Hg, with no other remarkable findings. Laboratory studies show sodium 145 mmol/L, potassium 4.3 mmol/L, chloride 103 mmol/L, CO₂ 26 mmol/L, glucose 91 mg/dL, and creatinine 1.3 mg/dL. An abdominal CT scan shows a 7 cm left adrenal mass. During surgery, as the left adrenal gland is removed, there is a marked rise in blood pressure. Which of the following laboratory test findings most likely explains his findings?

- A Decreased serum cortisol
- B Decreased urinary homovanillic acid
- C Increased serum ACTH
- D Increased urinary free catecholamines
- E Elevated serum ANCA

Ans: D

Pheochromocytoma is

A 47-year-old woman feels a 'lump' in her neck that she didn't notice 5 months before. Her physician palpates a firm nodule about 2 cm in size to the left of midline in the region of the thyroid gland. By scintigraphic scanning this nodule appears 'cold' with normal activity in the surrounding normally sized thyroid gland. Which of the following is the most likely diagnosis?

- A Papillary carcinoma
- B Follicular adenoma
- C Thyroglossal duct cyst
- D Toxic nodular goiter
- E Granulomatous thyroiditis
- F Hashimoto thyroiditis

Ans: B

(B) CORRECT. The majority of 'cold' thyroid nodules are benign and many are adenomas. Follicular neoplasms are difficult to definitively classify, and even some that appear histologically benign may eventually act in a more aggressive manner.

A 56-year-old woman has had diffuse, dull, constant abdominal pain for the past 2 months. On physical examination no abnormal findings are noted. An abdominal CT scan shows a 3 cm right adrenal mass. The right adrenal is excised and on microscopic examination the mass is composed of cells resembling adrenal cortex. Which of the following features is the most reliable indicator that this mass is malignant?

- A Cellular atypia
- B Presence of mitoses
- C Invasion
- D Size of the mass
- E Cellular necrosis

Ans: C

(C) CORRECT. Only a malignant endocrine tumor would invade and/or metastasize. The other features listed are suggestive of malignancy, but are not absolute.

A 49-year-old woman has had multiple episodes of lower abdominal pain for the past year. On 3 occasions she passed a urinary tract stone during or following an episode of pain. During the past month she has had pain in her right middle finger. On physical examination there is pain on palpation of her right 3rd proximal phalanx. Laboratory studies show a serum calcium of 13.7 mg/dL, phosphorus of 1.9 mg/dL, creatinine 1.1 mg/dL, and albumin 4.8 g/dL. Which of the following bone lesions is she most likely to have?

- A Osteitis fibrosa cystica
- B Osteoid osteoma
- C Osteochondroma
- D Osteomyelitis
- E Osteoporosis
- F Osteosarcoma

Ans: A

pretty simple, (A) CORRECT. Osteitis fibrosa cystica is a metabolic bone disease that occurs as a complication (one of the causes for bone pain) of primary hyperparathyroidism, which she likely has because her serum calcium is elevated and phosphorus decreased.

A 40-year-old woman notes increasing enlargement and discomfort in her neck over the past week. The nurse practitioner palpates diffuse, symmetrical enlargement with tenderness in the region of the thyroid gland. Thyroid function tests show serum TSH of 0.8 mU/L and thyroxine of 11.9 micrograms/dL. She is referred to an endocrinologist, but the next available appointment is in 8 weeks. When examined by the endocrinologist her thyroid is no longer palpable and there is no pain. Repeat thyroid function tests reveal a serum TSH of 3.8 mU/L and thyroxine of 5.7 micrograms/dL. Which of the following thyroid diseases is most likely to produce these findings?

- A Nodular goiter
- B Non-Hodgkin lymphoma
- C DeQuervain disease
- D Hashimoto thyroiditis
- E Graves disease
- F Riedel thyroiditis
- G Iodine deficiency

Ans: C

DeQuervain can be self limited!!

A 33-year-old previously healthy man has lateral visual field deficits, but his residual vision is 20/20. His facial features have changed over the past year. His shoe size has increased. A head CT scan reveals enlargement of the sella turcica. Which of the following hormones is most likely being secreted in excessive amounts in this man?

- A Antidiuretic hormone
- B Prolactin
- C ACTH
- D Growth hormone
- E Luteinizing hormone

Ans: D

D CORRECT. He has acromegaly, which affects soft tissues in adults, because bone turnover is low. In children with epiphyses that have not closed, gigantism occurs. His visual field deficits result from the macroadenoma pressing on the optic chiasm.

The mother of an 11-month-old infant had noted enlargement of the baby's abdomen within the past month. This is confirmed by the osteopathic physician, who notes that the baby is otherwise normally developed. An abdominal CT scan reveals a 6 cm mass, with some scattered calcifications, above the right kidney. Laboratory studies show a greatly elevated urinary vanillylmandelic acid (VMA), while the urinary homovanillic acid (HVA) is only slightly increased. The mass is removed and microscopically is composed of sheets of small blue cells. What is the most likely diagnosis?

- A congenital adrenal hyperplasia
- B Adrenal cortical carcinoma
- C Neuroblastoma
- D Non-Hodgkin lymphoma
- E Pheochromocytoma
- F Aldosteronoma

C مش داخل بس هو

A 53-year-old woman has pain in her neck for the past month. On physical examination her vital signs include T 37°C, P 77/minute, RR 16/minute, and BP 130/80 mm Hg. There is an irregular firm mass palpable in her left neck. A CT scan shows an infiltrative mass involving the left lobe of the thyroid and extending into adjacent soft tissues. Laboratory studies show TSH 2.9 mU/L, total serum thyroxine 8.6 microgm/dL, calcium 8.7 mg/dL, and phosphorus 2.8 mg/dL. A fine needle aspiration biopsy of the mass shows malignant spindle-shaped cells present that demonstrate a p53 mutation immunohistochemically. Which of the following neoplasms is this woman most likely to have?

- A Anaplastic carcinoma
- B Follicular carcinoma
- C Medullary carcinoma
- D Non-Hodgkin lymphoma
- E Papillary carcinoma
- F Parathyroid carcinoma

Ans: A

A 45-year-old man has a 4 month history of nonfocal, generalized headaches. On physical examination he is found to have a blood pressure of 170/110 mm Hg. Laboratory studies show a serum sodium of 146 mmol/L, potassium 2.3 mmol/L, chloride 103 mmol/L, CO₂ 27 mmol/L, glucose 82 mg/dL, and creatinine 1.2 mg/dL. His plasma renin activity is 0.1 ng/mL/hr and his serum aldosterone 65 ng/mL. Which of the following is the most likely cause for his findings?

- A 21-hydroxylase enzyme deficiency
- B Adrenal cortical adenoma
- C Pituitary adenoma
- D Exogenous corticosteroid administration
- E Renal cell carcinoma

Ans: B

A 40-year-old woman has noted painless swelling of her neck for the past 3 weeks. On physical examination there is diffuse enlargement of her thyroid. Laboratory studies show an increased titer of anti-thyroid peroxidase and anti-thyroglobulin antibodies. Within a month, the swelling has diminished. Which of the following complications is she most likely to develop?

- A Amyloidosis
- B Hypothyroidism
- C Non-Hodgkin lymphoma
- D Papillary carcinoma
- E Riedel thyroiditis

Ans: B
Hashimoto

A 45-year-old woman with severe rheumatoid arthritis has been on chronic corticosteroid therapy for the past 15 years. She is admitted for an orthopedic procedure to correct joint deformity from her disease. She continues to receive her regular dosage of 5 mg of prednisone per day. Three days postoperatively, she develops an aspiration pneumonia with *Klebsiella pneumoniae* cultured from sputum. Five days following the surgery, she becomes obtunded. Laboratory findings at that time include: sodium 105 mmol/L, potassium 5.4 mmol/L, chloride 87 mmol/L, CO₂ 16 mmol/L, glucose 40 mg/dL, and creatinine 1.1 mg/dL. Which of the following complications is most likely to have occurred in this patient?

- A Anterior pituitary necrosis
- B Waterhouse-Friderichsen syndrome
- C Acute Addisonian crisis
- D Conn syndrome
- E 21-hydroxylase deficiency

Ans: C

A 38-year-old woman has had a feeling of fullness in her neck for the past year. She is otherwise asymptomatic. Her physician's assistant palpates a symmetrically enlarged but nontender thyroid gland. She has no difficulty swallowing. There is no palpable lymphadenopathy. She is afebrile. Her serum TSH is 3.5 mU/L with total thyroxine of 8.2 micrograms/dL. Thyroid peroxidase antibody is not detected. Two years later, her thyroid has not appreciably changed in size. Which of the following conditions is she most likely to have?

- A Graves disease
- B Nodular goiter
- C Hashimoto thyroiditis
- D Anaplastic carcinoma
- E Follicular adenoma
- F Papillary carcinoma

Ans: B

(B) CORRECT. The most common cause for thyroid enlargement is a simple, nodular goiter. Most patients are euthyroid with this condition. Places far away from a seacoast (a source for iodine) are where endemic goiter used to be seen. Use of iodized salt eliminated the problem.

End of Part 1

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