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"Endocrine Pathology"

Case 1

61 y/o female with elevated Ca++ and a lump in the breast. Serum Ca^{++} was 12.1 mg%. Breast nodule was firm and 2 cm. Left inferior parathyroid was 2 cm. Following parathyroid surgery, Ca^{++} dropped to 8.6mg%.

Breast bx read as "infiltrating ductal ca." This slide is from the parathyroid tumor.

Dx: Parathyroid adenoma, so-called chief cell subtype (please see first reference)

Parathyroid adenoma-related hypercalcaemia in breast cancer: a critical diagnosis in clinical oncology. Barutca S; Yurekli Y; Erdogan S; Kadikoylu G; Kacar F. Int J Clin Pract 2003 Oct;57(8): p729-30.

Parathyroid chief cell adenoma associated with massive chronic parathyroiditis in a woman with hyperparathyroidism. Kovacs K; Bell CD; Juco J; Rotondo F; Anderson J. Endocr Pathol 2007 Spring;18(1): p42-5.

Mast cells in parathyroid glands of hyperparathyroidism. Anderson TJ. J Clin Pathol 1974 Jan;27(1): p31-4.

Intraoperative parathyroid hormone monitoring fails to detect double parathyroid adenomas: a 2-institution experience. Gauger PG; Agarwal G; England BG; Delbridge LW; Matz KA; Wilkinson M, Robinson BG, Thompson NW. Surgery 2001 Dec;130(6): p1005-10.

Childbearing and the risk of parathyroid adenoma--a dominant cause for primary hyperparathyroidism. Rastad J; Ekbom A; Hultin H; Wuu J; Lundgren E; Hsieh CC; Lambe M. J Intern Med 2001 Jul;250(1): p43-9.

Case 2

Three cm mass in region of the right thyroid lobe of a 36 y/o woman. Surgeon had a "difficult resection."

Dx: Parathyroid adenocarcinoma

Parathyroid carcinoma: problems in diagnosis and the need for radical surgery even in recurrent disease. Dotzenrath C; Goretzki PE; Sarbia M; Cupisti K; Feldkamp J; Roher HD. Eur J Surg Oncol 2001 Jun;27(4): p383-9.

Parathyroid carcinoma: diagnosis and management. Sheehan JJ; Hill AD; Walsh MF; Crotty TB; McDermott EW; O'Higgins NJ. Eur J Surg Oncol 2001 Apr;27(3): p321-4.

Intranuclear holes (cytoplasmic pseudoinclusions) in parathyroid neoplasms, or "holes happen". Goellner JR; Caudill JL. Cancer 2000 Feb 25;90(1): p41-6.

Parathyroid adenoma, hyperplasia, and carcinoma: localization, technical details of primary neck exploration, and treatment of hypercalcemic crisis. Kebebew E; Clark OH. Surg Oncol Clin N Am 1998 Oct;7(4): p721-48.

Case 3

Six y/o boy with a "cyst" in the anterior neck.

Dx: Thyroglossal duct cyst

Papillary thyroid carcinoma of the thyroglossal duct cyst: comparative cytohistologic and immunochemical study of 2 new cases and review of the literature. Falconieri G; Della Libera D; Zanella M. Int J Surg Pathol 2001 Jan;9(1): p65-71.

Diagnosis of papillary carcinoma in a thyroglossal duct cyst by fine-needle aspiration biopsy. Yang YJ; Haghir S; Wanamaker JR; Powers CN. Arch Pathol Lab Med 2000 Jan;124(1): p139-42.

Presentations of thyroglossal duct cysts in adults. Ewing CA; Kornblut A; Greeley C; Manz H. Eur Arch Otorhinolaryngol 1999;256(3): p136-8.

Fine needle aspiration cytology of thyroglossal duct cyst: an analysis of 10 cases. Chang TJ; Chang TC; Hsiao YL. Acta Cytol 1999 Mar-Apr;43(2): p321-2.

Morphology of the human thyroglossal tract: a histologic and macroscopic study in infants and children. Sprinzl GM; Koebke J; Wimmers-Klick J; Eckel HE; Thumfart WF. Ann Otol Rhinol Laryngol 2000 Dec;109(12 Pt 1): p1135-9.

Histological characterization of the thyroglossal tract: implications for surgical management. Chandra RK; Maddalozzo J; Kovarik P. Laryngoscope 2001 Jun;111(6): p1002-5.

Case 4

45 y/o woman with a painless 1.5 cm well-circumscribed pale tan firm nodule in the lower pole of the right thyroid lobe.

Dx: Medullary thyroid carcinoma

Three-dimensional cytomorphology in fine needle aspiration biopsy of medullary thyroid carcinoma. Chang TC; Lai SM; Wen CY; Hsiao YL; Huang SH. Acta Cytol 2001 Nov-Dec;45(6): p980-4.

Current approaches and perspectives in the therapy of medullary thyroid carcinoma. Vitale G; Caraglia M; Ciccarelli A; Lupoli G; Abbruzzese A; Tagliaferri P; Lupoli G. Cancer 2001 May 1;91(9): p1797-808.

Cytologic diagnosis of medullary carcinoma of the thyroid gland. Papaparaskeva K; Nagel H; Droese M. Diagn Cytopathol 2000 Jun;22(6): p351-8.

Advances in the diagnosis and management of thyroid neoplasms. Bi J; Lu B. Curr Opin Oncol 2000 Jan;12(1): p54-9.

Mixed medullary and follicular carcinoma of the thyroid. On the search for its histogenesis. Matias-Guiu X. Am J Pathol 1999 Nov;155(5): p1413-8.

Case 5

19 y/o woman had onset of secondary amenorrhea at age 15, 1 year after menarche. Hypertension was noted at age 16. Cortisols, FSH, LH, thyroid function tests, 17-hydroxysteroids, and 17 ketosteroids were normal. Nine months prior to admission she noted rounded facies, central obesity, 20 lb weight gain, and muscle weakness in the legs. She failed to suppress with either low dose or high dose dexamethasone suppression tests. CT showed a normal sella turcica but did find a 5 x 6 cm right adrenal mass.

When excised, the tumor was 4.5 cm in greatest diameter, red and yellow, encapsulated with the appearance of adrenal cortex. Focal hemorrhage and necrosis were present.

Dx: Adrenal cortical adenoma secreting cortisol (Cushings syndrome)

Cushing syndrome caused by topical corticosteroid: a case report. Gen R; Akbay E; Sezer K. Am J Med Sci 2007 Mar;333(3): p173-4.

The diagnosis and differential diagnosis of endogenous Cushing's syndrome. Makras P; Toloumis G; Papadogias D; Kaltsas GA; Besser M. Hormones (Athens 2006 Oct-Dec;5(4): p231-50.

Cushing syndrome due to an adrenal phaeochromocytoma. Gunasekara AD; Premawardhena AP; Hettiarachchi H; Ratnasena BG; de Silva HJ. Ceylon Med J 2006 Jun;51(2): p66-7.

Biochemical evaluation of adrenal dysfunction: the laboratory perspective. Snow K; Jiang NS; Kao PC; Scheithauer BW. Mayo Clin Proc 1992 Nov;67(11): p1055-65.

Cushing's syndrome: update of diagnosis and management. Carpenter PC. Mayo Clin Proc 1986 Jan;61(1): p49-58.

Carcinoid tumor of lung with Cushing's syndrome. Aghajanzadeh M; Alavy A; Hoda S; Mohammadi F. Arch Iran Med 2007 Jan;10(1): p94-6.

Case 6

12 x 9 x 7 ovoid adrenal tumor from a 76 y/o woman who suffered from hirsutism, water retention, and elevated cortisol levels without diurnal variation. (Case seen by Dr. Nancy Warner)

Dx: Adrenal carcinoma (low grade)

Giant nonfunctioning carcinoma of the adrenal cortex mimicking renal cell carcinoma: a diagnostic dilemma. Khan AA; Shergill IS; Hamid R; Gujral SS. Urology 2007 Jul;70(1): p178.

Experience with the surgical treatment of adrenal cortical carcinoma.

SO - Eur J Surg Oncol 2004 May;30(4): p444-9. Meyer A; Niemann U; Behrend M.

Outcomes of adrenal cortical carcinoma in the United States. Paton BL; Novitsky YW; Zerey M; Harrell AG; Norton HJ; Asbun H; Kercher KW; Heniford BT. Surgery 2006 Dec;140(6): p914-20; discussion 919-20.

Two cases of adrenocortical carcinoma presenting as Conn's syndrome. SO - J Hum Hypertens 2001 Jan;15(1): p75-9.

Immunohistochemical assessment of Ki-67 in the differential diagnosis of adrenocortical tumors. Terzolo M; Boccuzzi A; Bovio S; Cappia S; De Giuli P; Ali A; Paccotti P; Porpiglia F; Fontana D; Angeli A. Urology 2001 Jan;57(1): p176-82.

Case 7

46 y/o woman had pulsation in the right neck and a blood pressure of 240/120. Four yrs previously she had been diagnosed as having essential hypertension (normal IVP, serum cortisol, and potassium) and was given diuretics and Aldomet, which she had stopped using. Potassium was 2 mEq/L, plasma cortisol 7, and 17-hydroxysteroids 25 mg/24 hours (normal 3-15). An aortogram showed an orange-sized tumor of the left adrenal. Upon resection it was 8 x 7 x 5.5 and weighed 140 grams. It was homogeneous, slightly friable, glistening yellow tan.

Dx:Adrenal cortical adenoma secreting aldosterone

Pathology of Primary aldosteronism. Cancer 19:1854, 1966.

Expression and localization of human dopamine D2 and D4 receptor mRNA in the adrenal gland, aldosterone-producing adenoma, and pheochromocytoma. Wu KD; Chen YM; Chu TS; Chueh SC; Wu MH; Bor-Shen H. J Clin Endocrinol Metab 2001 Sep;86(9): p4460-7.

Predictive value of preoperative tests in discriminating bilateral adrenal hyperplasia from an aldosterone-producing adrenal adenoma. Phillips JL; Walther MM; Pezzullo JC; Rayford W; Choyke PL; Berman AA; Linehan WM; Doppman JL; Gill Jr. Comment In: J Clin Endocrinol Metab. 2001 Aug; 86(8):4004-5.

Adrenal capillary endothelial cells stimulate aldosterone release through a protein that is distinct from endothelin. Rosolowsky LJ; Hanke CJ; Campbell WB. Endocrinology 1999 Oct;140(10): p4411-8.

Aldosterone and vascular damage. Duprez D; De Buyzere M; Rietzschel ER; Clement DL. Curr Hypertens Rep 2000 Jun;2(3): p327-34.

Primary aldosteronism due to aldosterone producing adenoma without hypertension. Suzuki Y; Nakada T; Izumi T; IIjima Y; Ishigooka M; Sasagawa I. J Urol 1999 Apr;161(4): p1272.

Medical management of aldosterone-producing adenomas. Ghose RP; Hall PM; Bravo EL. Comment In: Ann Intern Med. 2000 Apr 4; 132(7):593-4.

Case 8

Large, hemorrhagic mass removed from the region of an adrenal gland of an adult male. It was

clinically secreting estradiol.

Dx: Adrenal carcinoma secreting estradiol

In men, peripheral estradiol levels directly reflect the action of estrogens at the hypothalamo-pituitary level to inhibit gonadotropin secretion. Raven G; de Jong FH; Kaufman JM; de Ronde W. J Clin Endocrinol Metab 2006 Sep;91(9): p3324-8.

Cosecretion of estrogen and inhibin B by a feminizing adrenocortical adenoma: impact on gonadotropin secretion. Kuhn JM; Lefebvre H; Duparc C; Pellerin A; Luton JP; Strauch G. Clin Endocrinol Metab 2002 May;87(5): p2367-75.

Feminizing adrenocortical adenoma presenting as heterosexual precocious puberty: report of one case. Hsiao HP; Chao MC; Lin CY; Chen HL; Chen SL; Chiou SS; Chen BH. Acta Paediatr Taiwan. 2005 Nov-Dec; 46(6):392.

An inhibin B and estrogen-secreting adrenocortical carcinoma leading to selective FSH suppression. Fragoso MC; Kohek MB; Martin RM; Latronico AC; Lucon AM; Zerbini MC; Longui CA; Mendonca BB; Domenice S. Horm Res 2007;67(1): p7-11.

Case 9

54 y/o female with acute cardiovascular collapse and acute renal failure. Following her myocardial infarction she had a hypertensive crisis with cardiopulmonary arrest and was resuscitated. Urinary catecholamines were 785 UG/24 hours (normal up to 115), urine VMA 125 mg/24 hours (normal 1-10), urine metanephrines 22.9 mg/24 hours (normal less than1.0), and urine HIAA 6.0 mg/24 hours (normal 2-8). A CT scan revealed a 10.0 cm mass above the left kidney. The mass was encapsulated, weighing 181 grams. Cut surface was bulging, pink-tan, firm to rubbery. In the center was a 6 cm zone of hydropic degeneration with focal necrosis.

Dx: Pheochromocytoma

A case of estrogen-secreting adrenocortical carcinoma with subclinical Cushing's syndrome. Fukai N; Hirono Y; Yoshimoto T; Doi M; Ohtsuka Y; Homma K; Shibata H; Sasano H; Hirata Y. Endocr J 2006 Apr;53(2): p237-45.

Insulin-like growth factors augment steroid production and expression of steroidogenic enzymes in human fetal adrenal cortical cells: implications for adrenal androgen regulation. Mesiano S; Katz SL; Lee JY; Jaffe RB. J Clin Endocrinol Metab 1997 May;82(5): p1390-6.

Soft-tissue images. Adrenocortical adenocarcinoma presenting as Conn's syndrome. Schmidt N. Can J Surg 1999 Apr;42(2): p86-7.

Renal tumors exhibiting granular cytoplasm. Reuter VE. Semin Diagn Pathol 1999 May;16(2): p135-45.

Laparoscopic adrenalectomy for the management of benign and malignant adrenal tumors. Cyriac J; Weizman D; Urbach DR. Expert Rev Med Devices 2006 Nov;3(6): p777-86.

Case 10

23 y/o woman with a highly vascular 3 cm mass in the right adrenal gland.

Dx: Pheochromocytoma (note morphologic differences between cases 9 and 10 … CTTR director DRC)

Flushing, pheochromocytoma, and the dermatologist. Heymann WR. J Am Acad Dermatol 2006 Dec;55(6): p1075-7.

Measurement of urinary metanephrines to screen for pheochromocytoma in an unselected hospital referral population. Brain KL; Kay J; Shine B. Clin Chem 2006 Nov;52(11): p2060-4.

Should patients with apparently sporadic pheochromocytomas or paragangliomas be screened for hereditary syndromes? Jimenez C; Cote G; Arnold A; Gagel RF. J Clin Endocrinol Metab 2006 Aug;91(8): p2851-8.

Cytologic features of pheochromocytoma and retroperitoneal paraganglioma: a morphologic and immunohistochemical study of 13 cases. Jimenez-Heffernan JA; Vicandi B; Lopez-Ferrer P; Gonzalez-Peramato P; Perez-Campos A; Viguer JM. Acta Cytol 2006 Jul-Aug;50(4): p372-8.

Evolving concepts in pheochromocytoma and paraganglioma. Dahia PL. Curr Opin Oncol 2006 Jan;18(1): p1-8.

Pheochromocytoma and functional paraganglioma syndrome: no longer the 10% tumor. Elder EE; Elder G; Larsson C. J Surg Oncol 2005 Mar 1;89(3): p193-201.