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DOCTOR :
Yazan Hassoonah

DONE BY :
Tareq El-Eblesch

CORRECTED BY :
NAME

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هاتف :

0797121818
06/5336475

Contact Us:

 **Ljnehan Asnan**
 Dental.c2013@gmail.com

 **Dental Correctionn**
 D.correction2013@gmail.com

- Endocrine system : glands without ducts .(Thyroid)
- Exocrine system : glands with ducts .(sweat glands)
- paracrine : hormones that are secreted to affect the nearby area.

-the endocrine system is very important because it regulates every function in the body for example the blood pressure , blood sugar , sleeping , activity , the endocrine system is the big boss of the body , the hypothalamus is the king then the pituitary is the princess which has an anterior and a posterior portions , now these two(the king and the princess) tells the other endocrine glands what to do , now if the king or the princess got diseased , almost the whole endocrine system will stop functioning , but if for example only the thyroid gland got diseased it will not affect the other endocrine glands .

-Diseases of the endocrine system : its either hyper functioning of a gland or hypo functioning of a gland , in general hypo functioning is more common than hyper functioning ;for example Diabetes which is very common is a hypo functioning disease (decreased secretion of insulin) .

-pituitary gland : has an anterior lobe and a posterior lobe , the anterior lobe secretes a large amount of hormones ex(ACTH , GH) , the posterior lobe secretes only two hormones which are(Oxytocin , ADH) , lack of ADH causes Diabetes Insipidus.

-Acromegaly : is a rare condition caused by excess production of GH after puberty , the same condition if happened before puberty will be called Gigantism , one of the most important features for this condition for us as dentists is the Macroglossia (enlarged tongue) and coarse facial features like large mandible because of the growth center in the condyle keeps growing and this will cause malocclusion and spacing of teeth ex; the acromegaly patient can have a class 3 incisal relation because of the over growth of the mandible that has protruded the mandible forward in front of the upper incisors , now the diagnosis of this is mostly through the external features of the disease just by looking at the patient then we investigate why do we have excess GH in the body and its usually due to a tumor in the pituitary gland that is causing it to secrete excess GH , now we as dentists are concerned about the complications of acromegaly like Diabetes , hypertension , these patients may have disarrhythmias during dental treatment because of the cardiomegaly(enlarged heart) , and they are suseptable for embolism , now the angle of the mandible can be very obtuse and wide and the ramus of the mandible will be longer than normal .

-Thyroid Gland : The thyroid gland is a butterfly-shaped organ located in the base of your neck. It releases hormones that control metabolism—the way your body uses energy , these hormones are (T3, T4) , now the word “Goiter” means enlarged thyroid gland only , this word “Goiter” doesn’t tell us anything else but this (the thyroid gland is enlarged) so it doesn’t tell us the reason nor anything else .

-Hypothyroidism : which is more common than Hyper :

.Primary Hypothyroidism : is a decrease in the levels of T3 and T4 because of the thyroid its self , the problem is in the thyroid gland it self , this primary hypothyroidism can be congenital (the baby is born with it) which is called “Cretinism” .

.Secondary Hypothyroidism : is a decrease in the levels of T3 and T4 because of the



pituitary gland is not secreting TSH(the activating hormone of the Thyroid) , so the problem is Not in the thyroid the problem is in the pituitary .

-now this hypo functioning can be also because of an Autoimmune disease which is common or because of Iodine deficiency (malnutrition) now they put Iodine in salt so that we don't get this deficiency (Iodine is mandatory for the synthesis of the T3 and T4 hormones) , or the patient can have hypo function of the thyroid simply because of surgery(thyroidectomy) .

-Features of a hypothyroidism patient : weight gain , tiredness , sleepy , lazy , can not focus , problems in remembering , (exactly like us in the lecture☺) , dry skin , **dry mouth** , constipation , facial Muphyness (the face is pumped منفوخ) , now we can make sure if the thyroid disease is an Autoimmune disease or not by a “thyroid antibody test” if there were antibody that are attacking the thyroid gland or not .

-Treatment for Hypothyroidism (primary and secondary) ; is exogenous Thyroxine hormone , and this implies to all endocrine diseases that we give the hormone that is deficient , now the patient has a check up appointment every 3 to 6 months to measure the level of the TSH , because if the TSH is low that means that the patient is getting too much thyroxine so we lower the dose but if the TSH is high that means that he is not taking enough thyroxine so we give him a higher dose of thyroxine .

-Dental treatment in relation to Hypothyroidism : if the patient was uncontrolled (not taking thyroxine) this will affect our dental treatment ; the patient will be susceptible for infection and he can go into a Myxedema coma (hypoglycemia , hypotension , loosing consciousness) because of the stress from the dental treatment , and there might be poor wound healing if we did surgery for the patient , so if the patient is uncontrolled we should not give him dental treatment , but if the patient was controlled and without any signs of hypothyroidism then the dental treatment is safe to be done.

-Oral manifestations of hypothyroidism : dry mouth but you have to be sure that this dry mouth is not from an antihypertensive drug for example because antihypertensive drugs often cause dry mouth , clompar (I couldn't hear this well) , Facial Muphiness (pumped face) .

-Hyperthyroidism : excessive production of the thyroid hormones so it's the opposite and also the signs and symptoms will be the opposite , there is primary and secondary Hyperthyroidism which are the same as we talked about them earlier .

-Most common causes of Hyperthyroidism : Autoimmune thyroid disease (Autoimmune thyroiditis or Gravis disease) , and there are other causes like thyroid adenoma (cancer) , Hashimoto thyroiditis .

-Hyperthyroidism features and signs : weight loss , heat intolerance (المريض يكون مشوب و) (مش طابق حاله , characteristic eye features (exophthalmus) .

. now most of the time the patient will not know that he has Hyperthyroidism so that's why the extra oral examination is important we should diagnose the patient .

. the diagnosis is done by the clinical features and signs and to do T3 and T4 levels test and more importantly the TSH (to determine if the disease is primary or secondary) .

-treatment : control the hypertension and palpitations , Antithyroid drug , radio active Iodine , surgical removal of the thyroid.



-oral manifestations of radioactive Iodine therapy : the Iodine can be uptaken by the salivary glands so the Iodine will damage the salivary glands just like it damages the thyroid and the patient might be presented with Xerostomia .

-Dental treatment : should be safe in controlled patients which are under therapy and don't have any signs of the disease , but if the patient is uncontrolled he can go into a Thyroid Toxicosis (Thyroid storm) because of the stress of the dental treatment ; so the patient will start secreting very large amounts of thyroid hormones and this will lead to palpitations and tachycardia and hypertension , and this is considered as serious complication , so we should not give dental care to the uncontrolled patient .

-Antithyroid drugs : Carbimazole (couldn't hear this well) this drug causes Leukopenia so this will affect us in dental treatment like upon surgery the patient is susceptible for infection .

--Parathyroid glands : the glands that are near (para) the thyroid , like the parotid gland is called like so because its near (para) the ear (otid) .

-these parathyroid glands secrete PTH (parathyroid hormone) its function is to raise the blood calcium in any way possible like it increases bone resorption and increases the absorption of calcium from the stomach and increases the synthesis of vitamin D , but it decreases the absorption of Phosphorus , so the PTH increases the calcium and decreases the phosphorus .

-we have Hyperparathyroidism and Hypoparathyroidism and the same as before we have primary and secondary.

-Hypoparathyroidism : we have a deficiency in the level of PTH , that means we should predict the signs and symptoms of Hypocalcemia(low calcium in blood) ; this will lead to tetany (involuntary contractions of the muscles) because the main function of Ca is muscle contraction and conduction of nerve impulses , so when the Ca level decreases we start to have problems in the peripheral nerves conduction , for example there are newborns that come to life with some involuntary contractions now we have to check the calcium level and the PTH level for this newborn , other signs and symptoms are cataracts (of the eyes) , **perioral parasthesia (oral sign) : the patient feels numb and a tingling sensation around the lips and teeth , this represents the mild involuntary contractions of the facial muscles that are caused by the Hypocalcemia** , and this might also affect the Heart of the patient by causing Disarhythmia .

-important signs to diagnose this Hypocalcemia : **chvostek sign** it means that when we tap on the facial nerve or on the facial muscles , the facial muscles contract and the facial expressions of the patient start to change , this happens because of the hyper excitability of the nerves because of the Hypocalcemia , another sign is called **Trousseau sign** which means carpopedal spasms (carpopedal spasms means involuntary cramps and contractions in the hands fingers and feet) .

-further diagnosis of this Hypoparathyroidism : Clinical features (we have just talked about them) , Hypocalcemia , low PTH , High Phosphorus .

-Treatment : exogenous PTH , exogenous Ca supplement , exogenous VitaminD , or all these together .

-Dental treatment : as we said in all endocrine diseases when the disease is controlled the dental treatment is Safe to be given , but if it was Uncontrolled the patient will have tetany and convulsions and disarhythmias so we should Not treat an Uncontrolled patient ,



sometimes the patient comes to us with facial parasthesia and twitching (perioral parasthesia) and this will be his chief complaint .

-Congenital Hypoparathyroidism : the baby is born with this disease , now this baby will also be born with **Enamel hypoplasia** because of the low Ca level in serum and blood because enamel synthesis needs Ca , also he might have incomplete root formation , delayed eruption of teeth or no eruption of some teeth , mucocutaneous candidiosis (this candidiosis usually comes from multiple endocrinopathy) .

-Hyperparathyroidism : (this has more oral important manifestations) in this condition we have excess secretion of PTH , excessive PTH will cause more and more bone resorption (might cause osteoporosis) , this also can be primary and secondary , the primary is usually due to a Tumor in the parathyroid glands , the secondary is not related to the pituitary gland as we got used to ; because the pituitary doesn't have any hormone that controls the parathyroid glands so the secondary Hyperparathyroidism is related to either Ca malabsorption due to Vitamin D deficiency or Chronic Renal failure (the body keeps losing Ca in the Urine so the PTH must compensate for that) , just for your information there is a tertiary version of this which is like the secondary but its more long spanned and because of this long span the glands turn into Autonomous mode (which means that the Glands are automatically secreting PTH without stopping nor control and we can not stop them) .

-signs and symptoms of the disease : weakness , malaise , polydipsia (thirst) , **Xerostomia** , nausea and vomiting , and the most seen three symptoms are Renal stones , Peptic ulcers , Bone disease (ex.osteoporosis) .

.now the patient will have a high PTH level and a high Ca level , well this is just in the primary version of the disease , in the secondary the PTH will be high but the Ca level will be Low because this low Ca level is the cause for this secondary Hyperparathyroidism in the first place and these causes were Ca malabsorption , vitamin D deficiency , chronic renal failure , GI disease (the GI is not absorbing Ca) .

.on the radiograph there will be resorption of the terminal Phalanges .

-Management of the disease : surgical removal of parathyroids then after the removal the patient will be treated as if he has Hypoparathyroidism (exogenous Ca and Vit D).

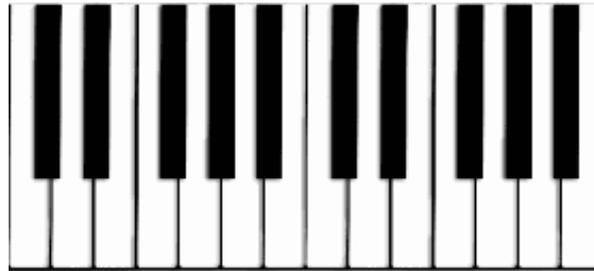
-Dental treatment : the renal stones and the chronic renal failure and the peptic ulcers will affect us in choosing the suitable drug for the patient for example the patient with a peptic ulcer can not take Aspirin , disarhythmias also affect us when we want to give an anesthetic agent with epinephrine , the epinephrine can cause tachycardia and heart problems .

-Oral manifestations : are mostly related to the Bone ; loss of the lamina dura , bone fracture , Brown tumor (is a giant cell lesion that has multinucleated giant cells and its called Brown tumor with Hyperparathyroidism , so if we found a patient with multiple bilateral Brown tumors in the mandible with the systemic features of the disease like a renal stone or peptic ulcers and bone pain we should do a test for the patient to see if there is Hyperparathyroidism or not , now if this Brown tumor is caused by the Hyperparathyroidism we just have to treat the Hyperparathyroidism then the Brown tumor will disappear but if the Brown tumor is not caused by this Hyperparathyroidism we should remove this Brown tumor surgically .



THANK YOU ALL

LOVE YOU ALL



Tareq El-Eblesch

