Thyroid

THYROID CANCER CASE REPORTS I

Efficacy of the Percutaneus Administration, Guided by Ultrasound, of Polidocanol Ablation for Cystic Thyroid Nodules

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SUN-LB79

Introduction: The cystic thyroid nodule is a variant of nodular disease presentation, it can condition compressive symptoms, drainage is an alternative for its management, but it presents an elevated rate of recurrence, injection of ethanol is an alternative for refractory cases but it requires multiple sessions and is not exempt for recurrence, on the other hand, polidocanol may represent a best alternative for treatment. **Objective:** Determine the efficacy of polidocanol administration for cystic thyroid nodule disease. **Study Design:** An experimental, prospective, comparative of before and after and analytical study was made. **Period and Population:** Patients older than 18 years were selected, with diagnosis of cystic thyroid nodule disease in whom drainage was made with subsequent ablation with polidocanol 1%, considering therapeutic efficacy a reduction of at least 50% in regard of initial volume. **Results:** 39 patients were studied, 33 (84-6%) were women, with an age of 49.0 (15.0) years old. All with palpable nodules, time of identification of 14.1 (11.69) months and a palpable size of 3.53 (2.02) cms. The predominant location was the right lobule (51.3%), 24 (61.5%) referred growth before the procedure conditioning compressive symptoms. The main cystic composition was pure and unique in 20 (51.3%). 10 (25.6%) referred important cosmetic problem/ dysphagia. TSH was 1.73 (1.22) mU/ ml. An initial volume was of 13.99 (11.72) ml and a final volume of 6.6 (12.1) ml, p 0.000 (IC 95% 4.4, 10.2). 3 (7.7%) presented hematoma and 2 (6.1%) pain. Time of follow- up was of 24 weeks. Reduction percentage 78.7 (32). 33 (84.6%) achieved a reduction ≥50% and 21 (53.8%) ≥85% of the initial volume. **Conclusion:** Polidocanol is effective and safe for cystic thyroid nodule disease treatment, its use should be proposed in patients with this pathology.

Adrenal

ADRENAL PHYSIOLOGY AND DISEASE

DLK1 Expressing Cells Contribute to the Zonation of the Adrenal Gland

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SUN-LB43

The adrenal cortex is a dynamic organ that undergoes self-renewal and remodeling in response to the demand for steroids. In the mouse it is divided into two concentric layers, the outer zona glomerulosa and the inner zona fasciculata (ZF), that secrete aldosterone and corticosterone, respectively. Cell fate mapping studies have shown that the maintenance of the cortex relies on a pool of stem/ progenitor cells located in the capsular and subcapsular compartments. Two interconnected cell populations have been identified, subcapsular undifferentiated cells secreting the morphogen Sonic Hedgehog (Shh) and capsular Gli1$^+$ cells, which can transduce the Shh signal (1); both populations are precursors of steroidogenic cells and newly formed cells migrate in a centripetal fashion to repopulate the gland until they reach the juxtamedullary region where they undergo senescence and apoptosis. Moreover, our lab has shown that the Notch atypical ligand Delta-Like homologue 1 (Dlk1) is expressed in partially undifferentiated cells of the subcapsular region in rat (2)and human (3) adrenals, whilst it is mostly expressed in capsular cells in mice (4,5). To investigate whether Dlk1 expressing cells contribute to the zonation of the adrenal cortex we conducted lineage tracing analyses using a tamoxifen inducible Dlk1^{CreERT2}mouse model carrying the R26tdTom reporter. Pregnant dames were injected with tamoxifen at embryonic day (e) 12.5 and pups were culled at postnatal day (p) 10 and p38. Analysis of tdTomato expression showed that 35% (p10) and 24% (p38) of Steroidogenic Factor 1(Sf1)$^+$cortical cells were tdTomato$^+$, revealing that capsular Dlk1$^+$cells are steroidogenic precursors. On the other hand, postnatal tamoxifen injections (p0) showed tdTomato$^{+/}$Sf1$^+$ cells only in 1-2% in cortical cells after 24-months chase, suggesting that the contribution of Dlk1$^+$cells to adrenocortical self-renewal is limited postnatally.However, the Dlk1$^+$population could be reactivated in the adult mouse treated with dexamethasone and was shown to contribute to the regeneration of the ZF once dexamethasone treatment was ceased.

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Diabetes Mellitus and Glucose Metabolism

DIABETES TECHNOLOGY

Development of a Machine-Learning Method for Predicting New Onset of Diabetes Mellitus: A Retrospective Analysis of 509,153 Annual Specific Health Checkup Records

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SAT-LB121

Diabetes mellitus (DM) is a chronic disorder, characterized by impaired glucose metabolism. It is linked to increased risks of several diseases such as atrial fibrillation, cancer, and cardiovascular diseases. Therefore, DM prevention is essential. However, the traditional regression-based DM-onset prediction methods are incapable of investigating future DM for generally healthy individuals without DM. Employing gradient-boosting decision trees, we developed a machine learning-based prediction model to identify the DM signatures, prior to the onset of DM. We employed the nationwide annual specific health checkup records, collected during the years 2008 to 2018, from Kanazawa city, Ishikawa, Japan. The data included the physical examinations, blood and urine tests, and participant questionnaires. Individuals without DM (at baseline), who underwent more than two annual health checkups during the said period, were included. The new cases of DM onset were recorded when the participants were diagnosed with DM in the annual check-ups. The dataset was divided into three subsets in a 6:2:2 ratio to constitute the training, tuning (internal validation), and testing datasets. Employing the testing dataset, the ability of our trained prediction model to calculate the area under the curve (AUC), precision, recall, F1 score, and overall accuracy was evaluated. Using a 1,000-iteration bootstrap method, every performance test resulted in a two-sided 95% confidence interval (CI). We included 509,153 annual health checkup records of 139,225 participants. Among them, 65,505 participants without DM were included, which constituted 36,303 participants in the training dataset and 13,101 participants in each of the tuning and testing datasets. We identified a total of 4,696 new DM-onset patients (7.2%) in the study period. Our trained model predicted the future incidence of DM with the AUC, precision, recall, F1 score, and overall accuracy of 0.71 (0.69-0.72 with 95% CI), 75.3% (71.6-78.8), 42.2% (39.3-45.2), 54.1% (51.2-56.7), and 94.9% (94.5-95.2), respectively. In conclusion, the machine learning-based prediction model satisfactorily identified the DM onset prior to the actual incidence.

Bone and Mineral Metabolism
BONE AND MINERAL CASE REPORTS II

Adult Hypophosphatasia and Postmenopausal Osteoporosis: A Challenging Case

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MON-LB71

Introduction: Hypophosphatasia (HPP) is a rare disease that cause osteomalacia and premature tooth loss due to abnormal bone mineralization. The clinical presentation ranges from severe neonatal and infantile HPP with a high morbidity and mortalilty to mild Adult HPP. The ranging spectrum is possibly due to autosomal recessive versus autosomal dominant missense mutations at the gene that encodes TNSALP. The hallmark of the disease is a low serum total alkaline phosphatase level (ALP). It is important to diagnose adult HPP particularly to refrain from treating with bone antiresorptive medications. Low levels of alkaline phosphatase generally are undected in the adult population even in patients with osteoporosis and fractures. We describe a case of a woman with postmenopausal osteoporosis without fractures diagnosed with adult HPP. The clinical course and management is described below. Case Description: A 62 y.o. women was referred for evaluation and treatment of osteoporosis. She had no fractures, including during childhood, no history of premature deciduous teeth loss, dental problems or nephrolithiasis. No family history of osteoporosis or fractures. Menopause at age 48 without hormone replacement therapy. Evaluation for secondary causes of osteoporosis was normal including serum TSH, calcium, phosphate, PTH, 24 hours urinary calcium and vitamin D-25. ALP ranged from 33-40 U/L (nl 37-126) before therapy. She was treated with raloxifene for 2 years. Therapy was switched to alendronate due to a decrease in bone density. She subsequently treated with alendronate for 5 years until 5/2012. Due to a decrease in bone density alendronate therapy was reinstituted between Jan 2013-Jan 2016 but in spite of therapy and a CTX level of 333 pg/ml bone density in the spine decreased significantly. In view of the low ALP and decreasing bone density while on bisphosphonate and a high B6 level (B6= 37 nl: -27) a genetic test for HPP and a compound heterozygote mutation in ALPL gene was detected. Her daughter was also found to have low ALP and carries the same mutation. Bone density has been stable since bisphosphonate therapy was stopped (spine T -3.2, LT femoral neck T -2.9) CTX 360 pg/ml. Recently therapy with raloxifene was initiated in view of the low bone density and high risk of fractures. Conclusion: The proper diagnosis and management of patients with adult HPP is challenging because the diagnosis may be missed in patients with borderline low ALP and on the other hand the proper managent of osteoporosis in these patients is not known.

Pediatric Endocrinology
PEDIATRIC OBESITY, THYROID, AND CANCER

Paediatric Type 2 Diabetes in a Single Centre in East London in the Period 2009-2018

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MON-LB018

Paediatric Type 2 diabetes in a single centre in East London in the period 2009-2018

Background: The incidence of Paediatric type 2 diabetes is increasing, especially in areas of deprivation.

Aim: To describe the cohort of CYP with T2D in Royal London Hospital over the period 2009-2018.

Methods: Retrospective analysis of patient cohort.

Results: Number of new patients doubled from 2.6/year in 2009-2013 to 5.3/year in 2014-2018. Prevalence in our cohort is 7.5% (national average of 2.5%, NPDA 2017-2018). Fourty patients (25 female, 15 male) were diagnosed in 2009-2018, with a mean age at diagnosis of 13.9+/-1.7 yrs. Males had more frequently learning difficulties compared to females (40% vs 20%). Sixty % of patients were Asian compared to 28% in our T1D cohort.