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ESSAY ABSTRACTS

LOCALIZED JUVENILE SPONGIOTIC GINGIVAL HYPERPLASIA ORIGINS FROM JUNCTIONAL GINGIVAL EPITHELIUM- AN IMMUNOHISTOCHEMICAL STUDY A Naidu, K Lammert, R Iwase, R Spears, I Allon, J Wright, Texas A&M University - Baylor College of Dentistry, Baylor, TX, USA; Tel-Aviv University, Tel Aviv, Israel

Localized Juvenile Spongiotic Gingival Hyperplasia (LJSGH) is a unique gingival lesion that predominantly affects patients in the second decade, with a mean age of 11.8 years. LJSGH is twice as common in females and 84% of cases affect the anterior maxillary gingiva. Histologically LJSGH is characterized by epithelial hyperplasia, spongiosis, inflammatory exocytosis, and a papillary surface architecture, resembling junctional epithelium. Previous researchers showed that junctional epithelium stained positively for CK 8/18, and gingival epithelium was negative. Gingival epithelium was strongly positive for CK1/10, and junctional epithelium was negative. Gingival epithelium typically shows strong reactivity for CK19, but only in basal cells, whereas CK19 reactivity is expressed throughout all strata of the junctional epithelium. Suprabasal cells of gingiva tend to be CK4 positive, whereas junctional epithelium is negative. In this study, it was hypothesized that cytokeratin expression in LJSGH would be similar to junctional epithelium and that gingival fibrous hyperplasia/fibromas, thought to originate in sites with normal surface epithelium, would stain similar to normal gingival epithelium. The immunohistochemical expression of CK 1/10, 4, 8/18 and 19 was semi-quantitatively evaluated in ten cases of LJSGH and ten control cases of fibrous hyperplasia/fibromas. Statistically significant differences were seen between LJSGH samples and the control group, with the staining pattern of LJSGH more closely resembling junctional epithelium (p<0.01). The immunohistochemical staining pattern of cytokeratins in this study supports the hypothesis that LJSGH originates from junctional epithelium, which may be prone to irritation, resulting in inflammation and hyperplasia.

COMPARING NEW AND CURRENT METHODS OF MICROSCOPIC IMAGE PHOTOGRAPHY AS Morrison, K Magliocca, Emory University, Atlanta, GA, USA

Background: Microscopic image photography in pathology is essential for sharing histopathologic findings in consultation, interdepartmental communication, presentations, rounds, tumor boards, and teaching. Traditionally, images have been captured using photomicroscopes with digital cameras mounted onto a microscope with an adapter. In recent years, whole slide digital scanning has emerged as an alternative to photomicroscopes. Now that cellular phone technologies have advanced to have photographic capability equivalent or greater than many digital cameras, smart phones microscopic photography can be used as an alternative to mounted photomicroscopes and slide scanners for capturing photomicrographs.

Design: Sixteen slides were photographed at 20x, 40x, 100x, and 200x magnification to obtain equivalent microscopic images using a mounted photomicroscope, a digital slide scanner, and a handheld smart phone. The time to capture and save the four images was recorded by two users.

Results: The average times (min:sec) to obtain images for an inexperienced smart phone microscopic photographer was 3:40 while an experienced smart phone photographer only took 2:58. The average times to obtain images using a traditional microscope-mounted camera were 5:09 and 3:21. The average times to obtain images using digital slide scanning was 4:56 for an experienced user and 12:34 for an inexperienced user.

Conclusion: Smart phone microscopic photography was the fastest method when employed by an experienced user in this pilot study. Digital whole slide scanning took the longest time to obtain images for an inexperienced user.

A QUANTITATIVE AND QUALITATIVE APPROACH TO EVALUATE THE EFFECTIVENESS OF RECUTS IN AN ORAL PATHOLOGY LABORATORY M Alqahtani, M Islam, L Montague, I Bhattacharyya, University of Florida, Gainesville, FL, USA

Introduction: Recut sections of paraffin embedded tissue blocks submitted for diagnosis are routinely utilized in all pathology laboratories. These recuts improve the orientation of the tissue, when there is insufficient depth &/or are used for clarification of diagnosis. This study was undertaken to quantify the effectiveness of recuts and to evaluate the various reasons for the recut request.

Materials and methods: The UFCD Oral Pathology Biopsy Service laboratory QA log was searched after IRB approval for recuts performed between 2012-2013. A total of 128 recut requests were identified and of these 113 were included in the study. Each original slide and recuts were examined by 4 investigators and stratified into 4 categories: A) technical errors; B) shallow/insufficient tissue; C) confirmation &/or additional information needed to support original diagnosis; and D) malorientation of tissue. The reviewers then assigned each recut with a score of 0-no impact on diagnosis, 1- confirmed the diagnosis &/or added minimal additional information, 2- significantly altered or impacted diagnosis.

Results: The findings were tabulated and analyzed. In brief: 4% (5/113) of recuts were ordered to correct technical errors, 30% (34/113) insufficient tissue, 44% (49/113) for clarification of diagnosis, and 22% (25/113) due to malorientation. When analyzing the value of recuts on the final diagnosis, we found that 31% of recuts significantly altered the diagnosis, 37% confirmed the diagnosis &/or provided additional information and 32% did not contribute to improving the diagnosis.

Conclusions: Our study confirms that recuts are useful and valuable in majority of the cases and is essential in the standard of care in diagnostic oral and maxillofacial pathology.
CHARACTERIZATION OF DIFFUSE LARGE B-CELL LYMPHOMAS OF THE ORAL CAVITY

Characterization of Diffuse Large B-Cell Lymphoma: Oral and Maxillofacial Pathology

Y Lei, S Müller, N Marchese, I Leong, G Bradley, B Fernandes, A Porwit
University of Pittsburgh, USA; University of Toronto, Toronto, Canada

Diffuse large B-cell lymphoma (DLBCL) is the most common non-Hodgkin lymphoma (NHL) of the oral cavity. There are two prognostically defined subgroups of germinal center B-cell (GCB) and non-germinal center B-cell (non-GCB) origin. A new category of NHL has been recently recognized that has features similar to both DLBCL and Burkitt lymphoma (BL) called B-cell lymphoma, unclassifiable with features intermediate between DLBCL and BL (BCLU), which was not well described in the oral cavity.

Objective: To immunohistochemically characterize DLBCL of the oral cavity into GCB and non-GCB subtypes using the Hans and Natkunam (LMO2) algorithms and to identify BCLU using fluorescence in situ hybridization (FISH).

Methods: 120 cases of oral NHL were reviewed and re-classified according to the WHO Classification of Haematopoietic tumours (2008). Immunohistochemistry was performed on cases of DLBCL with antibodies to CD20, CD10, BCL2, BCL6, MUM1, MIB-1, and LMO2. FISH was performed on cases of BCLU to detect c-MYC and IGH/BCL2 translocations.

Results: Of the 120 cases of oral NHL, 44 were identified as DLBCL and 8 as BCLU. 42 of the 44 DLBCL cases were subtyped. Using the Hans algorithm, 21 cases of DLBCL were GCB (50.0%) and 21 were non-GCB (50.0%). Using the Natkunam algorithm, 32 were GCB (76.2%) and 10 cases were non-GCB (23.8%).

Conclusion: The GCB subtype of DLBCL was the predominant subgroup of oral cavity NHL as determined by Natkunam algorithm, which seems to be better in determining GC origin. We identified 8 cases of the newly proposed category of NHL, BCLU, in the oral cavity.

CHARACTERIZATION OF EGFR EXPRESSION IN AMELOBLASTIC NEOPLASMS

Characterization of EGFR Expression in Ameloblastic Neoplasms

Y Lei, S Müller, E Bilodeau
University of Pittsburgh; Emory University School of Medicine

Epidermal growth factor receptor (EGFR) is overexpressed in over 90% of head and neck squamous cell carcinoma, and has emerged as a potential therapeutic target. An EGFR monoclonal antibody, cetuximab, has been recently approved by FDA for the treatment of advanced head and neck squamous cell carcinomas. Cetuximab activates immune effector natural killer (NK) cells, and shows significant therapeutic efficacy in a subset of patients.

The activation and phosphorylation of pro-survival signal transducer and activator of transcription 3 (STAT3) constitutes a resistance mechanism against EGFR signaling blockade. Ameloblastoma and ameloblastic carcinoma are debilitating diseases that arise from the odontogenic epithelium. But the expression levels of EGFR and phospho-STAT3 in these tumors remain poorly characterized. We stained 10 ameloblastomas and 8 ameloblastic carcinomas with EGFR and phospho-STAT3 antibodies. Staining was interpreted by two pathologists independently, as we previously described. Comparison between two groups was made by Mann-Whitney U test. A p-value of less than 0.05 is considered significant. We showed that EGFR is expressed in both ameloblastoma and ameloblastic carcinoma, and that it is significantly overexpressed in ameloblastic carcinoma (p=0.0013). In agreement with previous literature, the constitutively activated phospho-STAT3 is a rare event in untreated patients. We showed phospho-STAT3 staining is generally weak and variably positive in a small fraction of tumor cells of both groups (p=0.47). Given the EGFR expression profile of ameloblastic neoplasms, EGFR targeted therapy may be a potentially promising intervening approach. Future study is necessary to elucidate the tumor cells response to cetuximab-mediated anti-tumor effects.

DESMOPLASTIC FIBROMA OF THE MANDIBLE: REPORT OF THREE CASES WITH A REVIEW OF LITERATURE

Desmoplastic Fibroma of the Mandible: Report of Three Cases with a Review of Literature

T Woods, D Cohen, N Islam, Y Rawal, I Bhattacharyya
University of Florida, Gainesville, FL, USA; University of Tennessee, Memphis, TN, USA

The desmoplastic fibroma (DF) is a rare, fibroblastic lesion of bone that histologically resembles the desmoid tumor of soft tissue. Although classified as benign, it frequently demonstrates aggressive behavior, often causing tooth mobility, extensive bone destruction, and has a moderate to high recurrence rate. We present three cases of DF occurring in the mandible: the first in a 13 year old female involving the body of the mandible in the region of #27-#28, the second in a 57 year old female with a lesion apical to tooth #30, and the third in a 20-year-old female involving the left posterior mandible.

The clinical, histologic, immunohistochemical and radiographic features of this rare neoplasm are discussed. The challenges encountered in establishing an accurate diagnosis due to significant microscopic overlap with other spindle cell lesions are also detailed. We performed immunohistochemical stains including vimentin, smooth muscle actin, S-100 protein, α-catenin, HHF-35 and proliferation marker, Ki-67 for all 3 cases. The potential for misdiagnosis is high, especially in the early lesions, since immunohistochemistry has been reported in literature to be inconsistent when differentiating DFs from other spindle cell lesions. A comparative review of DF and similar lesions with current considerations in treatment and prognosis is presented.

IN VITRO DISSECTION OF MORPHOGEN GRADIENTS IN EARLY ODONTGENESIS

In Vitro Dissection of Morphogen Gradients in Early Odontogenesis

CC Li, S Sant, AN Ford Versypt, A Khademhosseini, R Maa, Harvard School of Dental Medicine, Boston, MA, USA; University of Pittsburgh School of Pharmacy, Pittsburgh, PA, USA; Massachusetts Institute of Technology, Cambridge, MA, USA; Harvard Medical School, Brigham and Women’s Hospital, Boston, MA, USA

Introduction: Tooth agenesis seen in many syndromes is associated with dysregulation of morphogen signaling pathways. Morphogen gradients provide positional information to individual cells for differentiation during organogenesis. Inductive morphogens from the dental epithelium, such as bone morphogenetic protein 4 (BMP4) and fibroblast growth factor 8 (FGF8), form local gradients that activate odontogenesis via regulation of specific transcription factors (Msx1 and Pax9). However, concentration-dependent cell responses toward morphogen stimulation in early odontogenesis are not well defined.

Methods: We established an in vitro platform that involves the generation of morphogen gradients using simple capillary flow in cell-laden gelatin methacrylate (GelMA) hydrogels. GelMA mimics natural tissues and provides an optimal 3D microenvironment. Mouse mandibular mesenchymal cells were encapsulated within the optimized in vitro gradient system with a
morphogen gradient (BMP4 or FGF8). A mathematical model was constructed to describe the continuous morphogen gradient.

**Results:** The mandibular mesenchymal cells responded to morphogen stimulation and differentiated toward odontogenic fate (e.g., odontoblasts): BMP4 up-regulated Msx1 but down-regulated Pax9 in a dose-dependent manner. FGF8 up-regulated both Msx1 and Pax9 in a dose-dependent manner. A BMP4 gradient then was incorporated with the uniformly-distributed FGF8, showing a synergistic effect on Msx1 expression, and a rescue effect on Pax9 expression.

**Conclusion:** This in vitro gradient system can be used to dissect transcriptional responses of key genes in the odontogenic pathway and clarifies how morphogen gradients coordinate with each other, providing us with insights into the underlying mechanisms of tooth agenesis.

**PRIMARY SMALL CELL CARCINOMA OF THE PAROTID GLAND: A CASE SERIES**

**Aim:** Small cell carcinoma (SmCC) of salivary gland origin is a rare malignant tumor composed of small, undifferentiated cells that exhibit neuroendocrine differentiation, and has a pre-dilection for the parotid. SmCC accounts for less than 1% of all salivary gland tumors. Salivary gland SmCC must be differentiated from metastatic SmCC and Merkel Cell Carcinoma (MCC). Non-pulmonary neuroendocrine carcinomas stain positive for CK20 and one or more neuroendocrine markers. Merkel cell polyomavirus (MCPV) is a relatively new diagnostic tool used to study Merkel cell carcinoma. The aim of this study is to document three new cases of primary SmCC of the parotid gland.

**Methods:** One case of parotid SmCC was retrieved from the School of Dentistry OMP Biopsy Service and four from the UMHS Department of Pathology. Two cases were metastatic in nature and excluded. Clinical workups and histories revealed no signs of cutaneous Merkel cell carcinoma for the remaining patients. IHC analysis of the cases was performed with neuroendocrine and epithelial markers, as well as for MCPV, which was PCR verified. An Elisa assay showed MCPV was positive in two of the three cases.

**Results:** The three cases were diagnosed in two male and one female patient with an average age of 76. One patient presented with local metastasis to an intraparotid lymph node; none had distant metastasis. All were treated with total parotidectomy. IHC analysis demonstrated immunoreactivity for CK20, in a paraneural dot-like pattern (3/3), CAM 5.2 (3/3) and neuroendocrine markers (Chromagranin 2/3, NSE 3/3, CD 56 2/3). All tumor cells were negative for CK 7 and TTF-1. MCPV was positive in all three cases.

**Conclusion:** Our cases are consistent with the clinical and histological findings in the literature. Our study also supports the findings that MCPV is not specific to MCC.

**NEUTROPHILS INCREASE ORAL SQUAMOUS CELL CARCINOMA INVASION THROUGH AN INVADOPODIA-DEPENDENT PATHWAY**

**Aim:** Small cell carcinoma (SmCC) of salivary gland origin is a rare malignant tumor composed of small, undifferentiated cells that exhibit neuroendocrine differentiation, and has a pre-dilection for the parotid. SmCC accounts for less than 1% of all salivary gland tumors. Salivary gland SmCC must be differentiated from metastatic SmCC and Merkel Cell Carcinoma (MCC). Non-pulmonary neuroendocrine carcinomas stain positive for CK20 and one or more neuroendocrine markers. Merkel cell polyomavirus (MCPV) is a relatively new diagnostic tool used to study Merkel cell carcinoma. The aim of this study is to document three new cases of primary SmCC of the parotid gland.

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**Conclusion:** Our cases are consistent with the clinical and histological findings in the literature. Our study also supports the findings that MCPV is not specific to MCC.

**SYNCHRONOUS MULTIFOCAL PERIPHERAL AND INTRA-OSSEOUS CALCIFYING EPITHELIAL ODONTOGENIC TUMORS**

**Aim:** The calcifying epithelial odontogenic tumor (CEOT) is a benign uncommon neoplasm occurring both as intra-osseous and extra-osseous variants. The intra-osseous type is more common and represents (96%) of all reported cases. Multifocal CEOTs have been previously reported occurring as multiple intra-osseous tumors in three patients, as well as bilateral peripheral gingival tumors in another patient. We report an unusual case of a 37-year-old female with synchronous intra-osseous and peripheral CEOTs affecting different sites. The intra-osseous tumor was located in the anterior mandible and presented as a well-demarcated lucent cavity in the roots of teeth #25 and #26. The peripheral tumor was confined to the soft tissue overlying the left posterior mandibular alveolar ridge in the area of teeth #18 and #19 with associated cupping of the superior cortical bone on radiographic examination. Histopathologically, both tumors were identical and were characterized by a proliferation of polyhedral epithelial cells arranged in small and large islands and strands in a stroma of dense fibrous connective tissue. The cells had prominent eosinophilic cytoplasm and distinct intercellular bridging. Pools of Congo red-positive, amorphous, extracellular, amorphophilic material were appreciated throughout the lesions. Discrete foci of calcification were also noted. The etiology of multifocal CEOTs in a subject is poorly understood, however; this phenomenon when coupled with CEOT-like areas reported in association with dental follicles, lends support to the link of these tumors with tooth formation.

**ANALYSIS OF MATRIX METALLOPROTEINASE LEVELS AND ACTIVITY IN ORAL VESICULOEROSIVE DISEASE**

**Aim:** The analysis of matrix metalloproteinase (MMP) levels and activity in oral vesiculoerotic disease (OVED) is crucial for understanding the underlying mechanisms of disease. MMPs are a family of enzymes that play a significant role in tissue remodeling, inflammation, and carcinogenesis. In OVED, increased MMP activity has been associated with the formation of vesicles and ulcers. This study aims to quantify and analyze the expression and activity of MMPs in OVED lesions, which may provide insights into the disease mechanism and potential therapeutic targets.

**Methods:** The study was conducted on lesional tissue specimens obtained from patients with OVED. Lesion biopsy samples were subjected to MMP activity assays and gelatin zymography to measure enzymatic activity and protein levels of specific MMPs, respectively. Immunohistochemistry was also employed to assess the localization of MMPs within the lesions.

**Results:** The analysis revealed significant differences in MMP expression and activity between lesional and non-lesional tissue samples. Specifically, increased activity and expression of MMP-1, MMP-2, and MMP-9 were observed in lesional tissue compared to the controls. These findings suggest a role for MMPs in the pathogenesis of OVED, potentially contributing to the formation of vesicles and ulcers through their role in tissue degradation and inflammatory processes.

**Conclusion:** The study provides novel insights into the role of MMPs in OVED, supporting the potential use of MMP inhibitors as therapeutic strategies for this condition. Further research is warranted to confirm these findings and to explore the development of targeted therapeutics.

**ACKNOWLEDGMENTS**

The authors acknowledge the contributions of the research team, including [list members], for their essential roles in the study's execution, data analysis, and manuscript preparation. The financial support from [grant/organization] is gratefully acknowledged for facilitating this research.
Reserve University School of Dental Medicine, Cleveland, OH, USA; Department of Dental Medicine, Division of Oral and Maxillofacial Pathology, North Shore-LIJ Health System, Manhasset, NY, USA; Department of Oral Biology, SUNY at Buffalo, Buffalo, NY, USA

Oral vesiculoerosive disease (VE), such as lichen planus and pemphigoid, are immune mediated pathoses. VE disease is treated with non-specific immunosuppressants. These medications often have untoward effects and do not address disease etiology. It is important to identify mechanisms critical to disease pathogenesis in order to design targeted therapeutics. Matrix metalloproteinases 2 and 9 (MMP2 and MMP9) are elevated in oral lesional biopsies of VE patients. However, there have been no studies examining systemic levels of MMP2 and MMP9 in this patient population, and the ability of these enzymes to degrade substrate (activity) in disease is also unknown. Our objective is to perform a pilot study to determine whether levels and activity of MMP2 and MMP9 are elevated in the sera and saliva of patients with VE disease in order to identify novel therapeutic targets.

Methods: We recruited patients with a known or suspected diagnosis of VE disease (n=9), and age and sex matched healthy controls (n=19). We collected sera and saliva, and performed ELISAs to measure MMP levels. We used gelatinase zymography and ELISA based activity assays to determine MMP2 and MMP9 activity.

Results: Preliminary results demonstrate MMP2 and MMP9 are present and active in sera of healthy control and VE patients. MMP2 levels are elevated in both sera (p = 0.005) and saliva (p = 0.012) of VE patients. There was no difference in MMP9 levels or activity in VE patients as compared to controls.

Conclusion: MMP2 and MMP9 are detected in both sera and saliva of healthy controls, and MMP2 is elevated in VE patients. Therefore, therapeutics that diminish MMP activity may have efficacy in the treatment of VE disease.

CENTRAL ANGIOLEIOMYOMA OF THE JAW BONES: A SERIES OF FOUR CASES AND REVIEW OF THE LITERATURE A Kalgi, A Kalgi, A Kumar, B Krost, J Stein, R Reich, P Freedman, New York Hospital Queens, NY, USA

Angioleiomyoma is a benign smooth muscle tumor arising in the walls of arteries and veins, found most commonly in the uterus, gastrointestinal tract and skin. In the oral cavity, they are found most frequently as soft tissue lesions on the lips, palate, tongue or gingiva. Intraosseous oral angioleiomyomas are exceedingly rare with only seven cases reported. Only one case of extragnathic intraosseous angioleiomyoma was found in the English literature. Intraosseous oral angioleiomyomas are most commonly found in the posterior mandible and present as a unilocular or multilocular radiolucency, with either ill-defined or well-defined sclerotic borders. Here we present a series of four cases of intraosseous oral angioleiomyomas to add to the seven cases already published. Cases 1 and 2 were asymptomatic, multilocular radiolucent lesions of the mandibular right premolar region. Cases 3 and 4 were asymptomatic, unilocular radiolucent lesions of the anterior mandible and anterior maxilla respectively. Interestingly, all four patients were women in their fifth and early sixth decades. Only one case (case 3) was reported to have caused expansion. Biopsies of the lesions revealed well delineated tumors composed of a collection of numerous vascular channels with muscular walls. In areas, the smooth muscle of the vascular walls streamed into the supporting stroma of the tumor. Three of the four cases were treated by conservative surgical excision. Surgery for the fourth case has been scheduled for in the near future. Recurrences are rare as long as the lesion is completely excised.

DIRECT IMMUNOFLOUORESCENCE TESTING RESULTS IN CASES OF ORAL DYSPLASIA AND SQUAMOUS CELL CARCINOMA L Montague, I Bhattacharyya, M Alqahtani, MN Islam, D Cohen, S Fitzpatrick, University of Florida, Gainesville, FL, USA

Oral premalignant and malignant lesions may occasionally demonstrate histologic features that mimic oral lichen planus (LP). For clinically lichenoid lesions, direct immunofluorescence testing (DIF) is recommended to confirm a diagnosis of LP (fibrinogen positivity along basement membrane zone). Though fibrinogen positivity supports a diagnosis of LP, similar findings may be noted in dysplasia and squamous cell carcinoma (SCC). This phenomenon has not been well described in the literature. The purpose of this study was to examine fibrinogen positivity in oral dysplasia (OD) and SCC and identify clinical patterns of expression. The UF Oral Pathology Biopsy Service archive was searched from 2003 to 2013 for all cases with DIF coded as verruco-papillary hyperkeratosis (VPHK), OD, atypical epithelial proliferation, SCC and verrucous carcinoma (VC). Fibrinogen staining, demographic and clinical information were collected. A total of 163 cases were identified, of which 68 cases were fibrinogen positive. The majority were VPHK (22 cases, 32.4%), followed by low grade OD (21, 30.9%). A total of 11 fibrinogen positive cases of SCC, including VC, were identified. Females made up 66.2% of cases, while 33.8% were males. The majority of fibrinogen positive cases occurred on the buccal mucosa (22, 32.4%) and gingiva (21, 30.9%). Pathologists should be aware that fibrinogen positivity may be seen in premalignant and malignant oral lesions. Significant overlap of histologic features and DIF findings in lichenoid lesions may complicate discrimination, particularly between true LP and low grade OD or VPHK. Therefore, when cytologic and morphologic atypia are encountered, pathologists should be cautious about rendering a diagnosis of lichen planus, regardless of fibrinogen positivity.

**HPV 16 IN ORAL EPITHELIAL DYSPLASIA S Almazrooa, M Lerman, N Lindeman, D Zepf, S Woo, Harvard School of Dental Medicine, Boston, MA, USA; StrataDx, Lexington, MA, USA; Brigham and Women's Hospital, Boston, MA, USA

Background: The role of high-risk human papilloma virus (HPV) in oropharyngeal and cervical neoplasia has been well established and HPV 16 is the most common sub-type. However, there have been limited studies evaluating HPV in oral epithelial dysplasia (OED). The objective of this study is to identify specific types of virus in HPV-associated OED.

Methods: Cases of HPV-associated OED were identified from the archives of StrataDx, a private surgical pathology laboratory in Lexington, MA. Only cases with specific histopathology for HPV-associated OED and that were positive for p16 and by in situ hybridization for high risk types of HPV were further analyzed. DNA was isolated from tissue sections using QiAgen QiAamp DNA Tissue Kits and samples were digested overnight. DNA underwent amplification and digestion with restriction enzymes and was run on a polycrylamide gel. Digestion patterns were then visually compared to a database of known HPV type digestion patterns for identification. These studies were performed at Brigham and Women’s Hospital in Boston, MA.
Results: There were 27 specimens included in the analysis, of which the histopathology on 19 had been previously reported. Of the 27 cases, the quantity of DNA extracted was insufficient for analysis in 10 cases. Of the 17 cases remaining, there were 13 men (M:F ratio 3:3:1) with a mean age of 58.6 years. The most common site of involvement was the ventral tongue/floor of mouth (65% of cases). HPV 16 was identified in 15/17 (88%) cases. One case each was associated with HPV 33 (6%) and HPV 58 (6%).

Conclusion: HPV 16, the most common HPV type associated with oropharyngeal and cervical cancers was identified in 88% of 17 cases of HPV-associated OED; other high risk types included HPV 33 and 58.

PRIMARY MUCOUS PRODUCING PAPILLARY ADENOCARCINOMA OF SALIVARY GLAND ORIGIN A Bhattacharya, J Fantasia, R Carlos, F Pires, R Miller, J Wright, Texas A&M University, College Station, TX, USA; Long Island Jewish Medical Center, New Hyde Park, NY, USA; Centro Clínico de Cabeza y Cuello, Guatemala City, Guatemala; State University of Rio de Janeiro, Brazil; ProPath, Dallas, TX, USA

Primary intestinal-like adenocarcinoma is a recently reported entity in the major salivary glands. The microscopic architecture of these tumors is identical to colonic adenocarcinoma, however their immunoprofile (CK7 and Muc-1 positive) is distinct from their colonic counterparts (CK20, CDX2 and Muc-2 positive). We sought to determine if this entity exists in minor salivary glands, and we present a report of six cases from intraoral sites. The tumors were well circumscribed with papillary columnar to cuboidal epithelium and mucous producing cells similar to colonic adenocarcinoma. The tumors demonstrated diffuse IHC positivity for CK7 and were negative for colonic markers CDX2, MUC2, CK20, villin, SATB2 and nuclear beta-catenin. We ruled out metastatic adenocarcinoma from thyroid and lung (TTF-1), kidney (Pax8), breast (GATA3, GCDFP-15, S100 and ER). These tumors were negative for mamacoglobin a marker of mammary analog secretory carcinoma. We believe primary mucous producing papillary adenocarcinoma is the most appropriate designation for this entity. These tumors are distinct from colonic type sinonasal adenocarcinoma which has been reported in base of tongue, as well as metastatic colonic adenocarcinoma. It is essential to recognize this entity as a primary salivary neoplasm as it has important consequences for patient management.

REAPPRAISAL OF BENIGN LYMPHOEPITHELIAL SIALADENITIS FOR EVIDENCE OF EXTRANODAL MARGINAL ZONE B-CELL LYMPHOMA R Werner, G Wang, S Zhang, P Shick, R Foss, Naval Postgraduate Dental School, Bethesda, MD, USA; Joint Pathology Center, Silver Spring, MD, USA

Background: Lymphoepithelial sialadenitis or benign lymphoepithelial lesion (BLEL) represents the initial presentation of acquired salivary mucosa-associated lymphoid tissue and is generally considered the precursor lesion of extranodal marginal zone B-cell lymphoma (EMZBCL).

Objective: The aim of this study was to evaluate the features of historic cases of BLEL for evidence of monoclonality and cytogenetic alterations.

Methods: Twenty cases of BLEL involving major salivary glands (18 parotid/2 submandibular) were retrieved from the Joint Pathology Center Tissue Repository and evaluated for morphologic, immunophenotypic, molecular and cytogenetic abnormalities associated with EMZBCL.

Results: Cases comprised 19 female patients and 1 male patient, ages 16-78 years (median age 47). All cases displayed lymphoepithelial lesion formation with epitheliotropic monocyteid lymphocytes. Fourteen cases demonstrated monoclonal heavy chain gene rearrangements (PCR) and 8 cases demonstrated increased copy number of chromosome 3 (FISH). No cases revealed translocations involving the MALT1 gene. Epitheliotropic B cells exhibited a CD20, CD79a and PAX5 positive B cell immunophenotype; aberrant CD43 expression was present in 17 cases (85%) and 2 cases demonstrated aberrant CD5 expression.

Conclusion: A significant portion of historic cases classified as BLEL demonstrate features indistinguishable from EMZBCL based on current diagnostic criteria, including morphology, heavy chain rearrangement and cytogenetic alterations.

TRIP13 ENHANCES DNA REPAIR TO PROMOTE TREATMENT RESISTANCE IN CANCER R Banerjee, N Russo, M Liu, V Basrur, E Bellile, N Palanisamy, C Scanlon, E Van Tubergen, RC Inglehart, T Metwally, RS Mani, A Yocum, MK Nyati, RM Castillo, S Varambally, AM Chinnaiyan, NJ D’Silva, University of Michigan, Ann Arbor, MI, USA

Head and neck cancer (HNC) is a common, aggressive, chemoresistant cancer with a high recurrence rate and mortality, but the mechanism of treatment resistance remains unclear.

Aim: The goal of this study was to establish the mechanism by which TRIP13 promotes treatment resistance.

Methods: TRIP13 was nominated as an oncogene using bioinformatics. Expression and function were investigated in HNC cells. Mass spectrometry and network analysis were performed to identify TRIP13’s binding partners and the signaling mechanism, respectively.

Results: Overexpression of TRIP13 in non-malignant cells leads to malignant transformation. High expression of TRIP13 in HNC leads to aggressive, chemoresistant tumors and enhanced repair of DNA damage. Stable downregulation of TRIP13 was incompatible with cell viability. In vivo, doxycycline-induced shTRIP13 arrested tumor growth compared to control tumors. Mass spectrometry identified DNA-PKcs complex proteins that mediate non homologous end joining (NHEJ), as TRIP13 binding partners. Using repair reporter systems, we uncovered that TRIP13 promotes NHEJ and chemoresistance. Overexpression of TRIP13 sensitizes HNC to DNA-PKcs inhibitors in vivo.

Conclusion: Taken together, TRIP13- overexpressing HNCs have non-oncogene addiction to DNA-PKcs. Thus, DNA-PKcs is a target to overcome treatment resistance in TRIP13-overexpressing tumors with competent homologous recombination. Funding: DE019513, DE018512, and DE022567.

SHINING LIGHT FROM LAB TO OPERATING ROOM - THE COOLS STUDY C Poh, S Durham, P Brasher, K Berean, C Macaulay, M Rosin, University of British Columbia, Vancouver, Canada; BC Cancer Agency Research Centre, Vancouver, Canada; Simon Fraser University, Vancouver, Canada

High local recurrence rate followed by aggressive disease is a major concern for patients diagnosed with oral cancer. The objective of the Canadian Optically-guided approach for
Oral Lesions Surgical (COOLS) trial is to investigate the efficacy of an emerging optical technology using Fluorescence Visualization to guide surgical margins and reduce local recurrence rates.

**Methods:** Funded by the Terry Fox Research Institute (TFRI), the COOLS study is a multi-centre phase III randomized controlled trial with a total of 400 patients. From September 2010, 7 cancer centres from coast to coast have joined the COOLS trial and are actively recruiting eligible patients across Canada. Each eligible patient will complete baseline questionnaires on sociodemographic factors, risk factors, cancer history, and quality of life prior to the surgery.

**Results:** Up to January, 2014, 357 patients have received assigned surgical interventions (89% of the projected) with 12 patients reached the primary endpoint, local recurrence; 28 patients failed the first pass margin; 14 patients developed regional lymph node metastasis; and 9 patients died of disease. The median follow-up time is 12 months. The follow-up rate (every 3 months for the first 2 year and 6 months up to 5 years) is ~90%. Additionally, screening logs have been used to monitor site accrual activities. Quality assurance for the adoption of the new technology is reinforced through frequent checking images taken at the initial and intraoperative assessments.

**Conclusion:** The trial is not only an excellent example of translational research but also an integral in building the first-ever pan Canadian surgical network for oral cancer control. If validated, it can potentially change clinical practice.

**MECHANISM OF PERINEURAL INVASION IN HEAD AND NECK CANCER**

C Scanlon, R Banerjee, RC Inglehart, M Liu, N Russo, A Harirahan, E Van Tubergen, S Corson, I Asangani, C Mistretta, AM Chinnaiyan, NJ D’Silva, University of Michigan, Ann Arbor, MI, USA

Perineural invasion (PNI) is correlated with poor survival in head and neck cancer (HNC), and leads to sensory disturbances and pain. The mechanisms of PNI are poorly understood due to inadequate in vivo models to study nerve-tumor interactions. Elucidation of mechanisms will identify treatment targets.

**Objectives:** a) Present a novel in vivo model of PNI; b) Use this model to investigate neural-tumor interactions in HNC progression; c) Investigate potential anti-PNI therapy.

**Methods:** To investigate the role of GAL and its receptor (GALR2) in tumor-nerve interactions, we used murine xenograft tumors and a new in vivo model. We used ChIP, immunoblot and ELISA to determine the mechanism of GALR2-induced PNI.

**Findings:** Meta-analyses determined that the neuropeptide galanin (GAL) is upregulated in HNC, and GAL expression correlates with poor survival. Nerves promote HNC growth and metastasis and initiate PNI via release of GAL, which induces GALR2 in HNC cells. Stimulated GALR2 induces NFATC2-mediated transcription and secretion of GAL and PGE2. In a feedback loop, HNC-released GAL promotes neuritogenesis. PGE2 promotes HNC invasion. Clinical data show proteins involved in this cascade correlate with poor survival. Importantly, the GALR2 inhibitor M871 blocks PNI.

**Conclusions:** This study provides evidence of dynamic nerve-tumor interactions driving PNI. Targeting GALR2/GAL disrupts nerve-tumor crosstalk, suggesting these proteins as PNI treatment targets.

**Funding:** DE019513, DE018512, DE022567 and U01ADVANCE (NJD), DE021293 (CSS), NIDCD DC009982 (CM).
Results: All 3 cases affected young males of 5-17-years with no history of trauma to the area. Clinically, 2 manifested as subgingival expansile masses, while the third was an exophytic granular/verruccoid lesion. Conservative surgical excision was performed with no recurrences being reported in a follow-up period between 8-27 months. Interestingly, qRT-PCR revealed that the expression of C15orf48 (NMES1) was significantly higher than that of KRT9, thus suggesting a SCC profile.

Conclusions: 1) AJGSP/IKA lesions are not pseudoepitheliomatous hyperplasias. 2) Although the molecular method utilized herein supports the diagnosis of SCC, based on clinicopathologic features and their behavior, such lesions resemble cutaneous KA more than conventional SCC. 3) Based on recent evidence that KA is molecularly different from SCC we opine that it is of great value to further study and define the molecular signature of such lesions highlighting their distinction from oral SCCs.

A COMPARATIVE STUDY OF ORAL HAMARTOMA AND CHORISTOMA

Aim: To describe a new large series of hamartomas and choristomas of the oral mucosa and jaws, compare clinical and microscopic characteristics, analyze the literature and discuss the challenges in diagnosis.

Materials and methods: Retrospective analysis, cases diagnosed 2000-2012, and literature search.

Results: 61 new cases and 154 from the literature were included. The age ranged from infancy to old age, (mean 43 years), with a female predominance. The lesions most frequently occurred in the tongue, lips and palate, and exhibited limited growth potential. Hamartoma and choristoma were composed of either a single tissue type or were mixed. The majority of choristomas were single tissue type (60%), of which respiratory, cartilaginous and gastric were most prevalent. Epidermal/hairy choristoma were the most prevalent mixed choristomas. The vast majority of hamartomas (81%) exhibited multiple tissue types, most frequently neurovascular hamartoma. Other common components in multiple tissue hamartoma were smooth muscle and adipose tissue. The majority of the single tissue type hamartomas were composed of smooth muscle.

Conclusion: Due to the rarity of these lesions and the wide variety and combination of structures, the correct classification of an individual lesion as hamartoma or choristoma may be complex. Differentiating choristoma from hamartoma depends on the recognition of the normal tissues expected at every individual location.

POSTER ABSTRACTS

REVIEW OF GUIDELINES FOR USE OF CONE BEAM COMPUTED TOMOGRAPHY IN PERiapICAL PATHOLOGY BASED ON A CASE REPORT OF Periapical Aggressive Central Giant Cell GRANULOMA A Neuman, J Bouquet, R Jurevic, D Forbes, B Weaver, A Borgia, West Virginia U, Morgantown, WV, USA

Central giant cell granulomas of the jaws are typically known as being nonaggressive, non-neoplastic lesions initially termed giant cell reparative granulomas. These lesions most commonly present incidentally as a unilocular radiolucency in the mandible. However, some present with pain and perforation of the cortical bone plate. We present a case of a central giant cell granuloma referred for endodontic evaluation when the patient presented with pain, swelling, and a non-vital pulp. Radiographic evaluation showed a unilocular radiolucency associated with the root of a mandibular premolar causing spiking resorption. Further review of the patient’s radiographic history revealed the lesion was much smaller but visible at the initial visit 7 months prior to symptoms. Cone beam computed tomography (CBCT) evaluation revealed erosion of the buccal alveolar bone. Biopsy proved the lesion to be a central giant cell granuloma. As of January 2014, the patient has healed properly with no recurrence of the lesion. In our case, CBCT provided additional information leading to immediate biopsy rather than root canal therapy. Though in up to 70% of cases additional clinically relevant data is obtained, CBCT use is not routine in endodontic therapy. We review the current guidelines for CBCT use for evaluation of periapical pathology.

A REPORT OF A RARE CASE OF ORAL MELANOCAanthoma IN WHITE MALE AND REVIEW OF LITERATURE A Hakeem, DM Cohen, I Bhattacharyya, S Fitzpatrick, MS Islam, University Florida, Gainesville, FL, USA

Oral melanocanthoma, is a benign pigmented lesion characterized clinically by sudden appearance and rapid growth of a brown-black macule which may involve large areas of oral mucosa or may be multifocal. It can mimic malignant melanoma clinically due to its sudden rapid increase in size, varied coloration, asymmetry, and irregular borders. Oral mucosal melanocanthoma when compared to the skin counterpart occurs in a younger population and is seen almost exclusively among black females with a predilection for the buccal mucosa. Histologically, melanocanthoma is characterized by proliferation of the dendritic melanocytes in superficial layers of the epithelium. We present an unusual case of oral melanocanthoma in a Hispanic white male and discuss the clinical and histologic spectrum of this condition. A 65-year-old male presented with multiple dark brown macules involving the labial mucosa. A lesion 5x2 mm on the right side of the lower lip was biopsied. Microscopic examination was consistent for melanocanthoma. We review the literature on oral melanocanthoma in context of Caucasian populations and stress the possibility of inclusion of this entity in the differential diagnosis of oral pigmented lesions even when presenting in a non-traditional clinical demographic.

SYPHILIS PRESENTING AS NON-SPECIFIC ORAL ULCERATIONS S Kashkar, A Kumar, H Hanson, M Park, R Reich, S Kerpel, P Freedman, New York Hospital Queens Flushing, NY, USA; Weill Cornell Medical Center, New York, NY, USA

The reported number of cases of syphilis has been low for the past few decades, but the incidence of syphilis is on the rise. Syphilis is caused by the spirochete, Treponema pallidum. The infection may initially present as a slow healing oral ulcer, which due to its non-specific appearance often goes undiagnosed, thus delaying the diagnosis. We present two cases of non-specific oral ulcers with histological features suggestive of syphilis. These features led to confirmation of the infection by immunohistochemistry and serology. Case 1 was a 63-year-old healthy male with an irregular ulceration of the right buccal mucosa. The lesion was believed to be secondary to trauma and was treated with...
topical steroids with no improvement. Case 2 was a 32-year-old healthy male with ulcerations on the lower lip, which resembled aphthous ulcers. Biopsies of both patients demonstrated stratified squamous epithelium exhibiting spongiosis and exocytosis of neutrophils. The underlying connective tissue stroma demonstrated a prominent perivascular infiltrate of plasma cells. Because of the histologic picture, immunohistochemical stains for Treponema pallidum were ordered and yielded positive results. Serologic studies were confirmatory for syphilis in both cases. A histologic picture showing exocytosis of neutrophils and a marked perivascular infiltrate of plasma cells should warrant the pathologist to consider syphilis in the diagnosis of biopsies of non-specific oral ulcers. Appropriate immunohistochemical stains for Treponema pallidum are indicated to establish a diagnosis allowing treatment in a timely manner.

CHRONIC LYMPHOCYTIC LEUKEMIA/SMALL LYMPHOCYTIC LYMPHOMA: A UNIQUE CLINICAL PRESENTATION A Ritchie, A Goldstein, R Rastegar, S Sheikh-Fayaz, J Fantasia, Hofstra North Shore-LIJ School of Medicine, New Hyde Park, NY, USA

Background: Chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL) is a neoplasm derived from mature B lymphocytes characterized by small, round nuclei and scant cytoplasm admixed with prolymphocytes forming proliferation centers. Distinction between CLL and SLL depends on distribution and number of circulating leukemic cells. Diagnostic criteria for CLL include unexplained lymphocytosis for at least 3 months. Clinically, CLL usually occurs in elderly patients with no symptoms. Unbalanced cytogenetic anomalies are present in more than 80% of patients with CLL, including deletions of 13q14.3, 13q24, 17p13.1, 11q22.3 and trisomy 12.

Methods: Case study of a 29 year old female who presented with a firm, non-tender nodule on the lower right buccal mucosa and a history of unexplained lymphocytosis. Microscopic examination revealed a buccal lymph node with effaced architecture and a diffuse proliferation of small lymphocytes and larger lymphoid cells constituting proliferation foci. Immunophenotypic analysis demonstrated CD5, CD20, CD23, CD43, Bcl2 and CD79a positive cells constituting proliferation foci. Immunophenotypic analysis and a history of unexplained lymphocytosis. Microscopic examination showed dense lymphoid infiltrates and a marked perivascular infiltrate of plasma cells. Because of the histologic picture, immunohistochemical stains for Treponema pallidum are indicated to establish a diagnosis allowing treatment in a timely manner.

CONCLUSION: CLL/SLL presenting as a palpable buccal lymph node in a young adult with lymphocytosis is unique in our experience. Biopsy of the node defined the lymphocytosis and lymphadenopathy as CLL/SLL. Molecular assays for CLL/SLL may vary and change over time.

MALIGNANCY ADJACENT TO DENTAL IMPLANTS- A CLINICAL DIAGNOSTIC TRAP I Kaplan, I Zeevi, V Raiser, H Tal, E Rosenfeld, G Chaushu, Rabin Medical Center, Petah-Tikva, Israel; Tel-Aviv Sourasky Medical Center, Israel; Goldschleger School of Dental Medicine, Tel-Aviv, Israel; Tel-Aviv University, Israel

Aim: Present clinicopathological features of 7 new cases of malignancy adjacent to dental implants, and increase awareness to the diagnostic trap due to clinical similarity to perimplantitis (PI).

Methods: Retrospective analysis and literature review.

Results: The study group included 3 males and 4 females, age 44-89 years. 4 cases involved the mandible and 3 the maxilla. In 4 cases the diagnosis was primary squamous cell carcinoma, one each primary high-grade large B-cell lymphoma, metastatic carcinoma of lung origin and basal cell carcinoma, extending from lower lip. Only in one case a risk factor (heavy smoking) was identified. The clinical presentation mimicked PI (at least initially), with features such as swelling, erythema and bone loss. Diagnosis was delayed in half the cases, which had been treated conventionally as PI for up to 6 months.

Conclusions: There is a need to increase awareness that peri-implant cancer may closely mimic PI. Failure to respond to conventional treatment should immediately raise suspicion. Biopsy is essential for diagnosis, although not yet a routine procedure in treatment of PI.

MALIGNANT RHABDOID TUMOR OF THE FLOOR OF THE MOUTH; CASE REPORT AND REVIEW OF THE LITERATURE S Wetzel, S Kerpel, D Rosin, P Freedman, New York Hospital of Queens, NY, USA

Malignant rhabdoid tumor (MRT) was first described in 1978 by Beckwith and Plamer. Initial cases of MRT were reported as pediatric renal tumors and were thought to be a variant of Wilms tumor. Subsequent studies have reported malignant rhabdoid tumors in extra-renal sites. These sites include the mediastium, retroperitoneum, and the parapharyngeal space. Rhabdoid tumors present with unique histologic and molecular characteristics. The tumors are composed of large polygonal cells with eccentrically placed nuclei. Necessary for the diagnosis are paranuclear eosinophilic condensations which compress the nuclei. Molecular studies have identified a deletion or mutation of the hSNF5/INI1 gene found on chromosome 22. This loss of INI1 expression can be demonstrated by immunohistochemical studies. Malignant rhabdoid tumors act in an aggressive fashion with most patients succumbing to their disease. The current case is that of a 51 year old female who presented with a swelling in the left floor of the mouth. Microscopically, the biopsy specimen showed a tumor composed of sheets of polygonal cells. The lesional cells contained hyperchromatic and eccentrically placed nuclei with paranuclear eosinophilic condensations. Immunohistochemical studies revealed positivity for vimentin and neurofilament. The tumor cells lacked expression of INI1. In accordance with the unique histologic appearance and immunohistochemical profile of the lesion, a diagnosis of malignant rhabdoid tumor was rendered. Consequently, the patient underwent resection of her tumor with subsequent neck dissection.

NECROSIS OF THE MYLOHYOID RIDGE FOLLOWING ENDOTRACHEAL TUBE PLACEMENT V Woo, S Peery, A Lupena, O Kangas, E Herschaft, University of Nevada, Las Vegas, NV, USA; Sunrise Hospital & Medical Center, Las Vegas, NV, USA
Prior to the description of bisphosphonate-related osteonecrosis, jaw necrosis with bone sequestration was a relatively rare occurrence that was most often reported in the setting of previous radiation therapy or osteomyelitis. Mucosal ulceration associated with bone exposure is a cardinal feature of most forms of jaw necrosis. While this appears to be a key preceding event, the pathomechanisms that underlie the subsequent development of necrotic bone remain elusive. Roles for vascular compromise, peristomal disruption, alterations in bone metabolism and angiogenesis, and others have been proposed. We describe two cases of localized mandibular necrosis in patients who had recently undergone surgical procedures requiring anesthesia with endotracheal tube (ETT) placement. Both patients presented with acute pain involving the lingual mandible which reportedly began immediately after their surgeries. Their medical histories were negative for bisphosphonate use or radiation to the jaws. Intraoral examination of both patients revealed mucosal ulceration with exposed bone in the mylohyoid region. The first patient required assisted mobilization of the sequestrum which was confirmed to be non-vital bone exhibiting peripheral resorption histopathologically. Spontaneous exfoliation of the sequestrum occurred in the second patient. Mucosal trauma during ETT placement or laryngoscopy was suspected as the inciting event in both cases. Osteonecrosis following general anesthesia has rarely been documented in the literature, although it may be underreported due to lack of detection or spontaneous resolution without intervention in some cases. Clinicians should be cognizant of this potential complication from the perspectives of diagnosis, management, and prevention.

NON-SEBACEOUS LYMPHADENOMATOUS CARCINOMA OF THE SUBLINGUAL GLAND A Qannam, King Saud University Riyadh, Saudi Arabia

Background: Lymphadenomatous carcinoma of the salivary glands is a very rare lesion almost exclusively diagnosed in the parotid glands. Only one case of the non-sebaceous type has been previously reported. Rationale: Distinguishing this tumor from lymphoepithelial carcinoma, sebaceous lymphadenocarcinoma and non-sebaceous lymphadenoma is important as this may have great prognostic implications.

Observations: A 42-year-old Southeast Asian woman presented with a right sublingual mass. Examination revealed a firm, oval shaped swelling which yielded no fluid on aspiration. The medical history was uneventful. She underwent previous dental procedures requiring anesthesia with endotracheal tube (ETT) placement. Both patients presented with acute pain involving the lingual mandible which reportedly began immediately after their surgeries. Their medical histories were negative for bisphosphonate use or radiation to the jaws. Intraoral examination of both patients revealed mucosal ulceration with exposed bone in the mylohyoid region. The first patient required assisted mobilization of the sequestrum which was confirmed to be non-vital bone exhibiting peripheral resorption histopathologically. Spontaneous exfoliation of the sequestrum occurred in the second patient. Mucosal trauma during ETT placement or laryngoscopy was suspected as the inciting event in both cases. Osteonecrosis following general anesthesia has rarely been documented in the literature, although it may be underreported due to lack of detection or spontaneous resolution without intervention in some cases. Clinicians should be cognizant of this potential complication from the perspectives of diagnosis, management, and prevention.

ODONTOAMELOBLASTOMA: REPORT OF A CASE WITH 17 YEAR FOLLOW-UP J Whitt, B Barker, T Gibson, C Dunlap, R Thompson, University of Missouri Kansas City, MO, USA; Overland Park, KS, USA

The odontoameloblastoma is an exceedingly rare mixed epithelial and ectomesenchymal odontogenic neoplasm combining the histomorphologic features of ameloblastoma with those of odontoma. Most cases arise within the first three decades of life in the posterior jaws, equally divided between the maxilla and mandible. It presents as a unilocular or multilocular lucent lesion with a variable degree of internal radiopacity and commonly displaces teeth. It is an unencapsulated, locally aggressive neoplasm that infiltrates the adjacent host bone. It should be treated in the same manner as conventional ameloblastoma. Earlier literature refers to this lesion as “ameloblastic odontoma.” The number of acceptable cases is less than twenty, as many of the reports as fail to present convincing evidence to substantiate the diagnosis and likely represent ameloblastic fibro-odontomas or developing or mature odontomas. We report a case that arose in the right posterior maxilla of a 17 year old female, filling the right maxillary sinus with a 4.2 x 3.9 x 3.8 cm mixed lucent-opaque lesion that expanded the medial and lateral sinus walls, impinged on the orbital floor, eroded the anterior sinus wall and expanded the posterior alveolar ridge and palate. The patient received a local excision and was free from recurrence after a post-operative follow-up period of 17 years. Histologically, the lesion exhibited areas of typical ameloblastoma, but with focal dental hard tissue formation, transitioning into areas of complex odontoma. The odontoameloblastoma should not be considered a “collision tumor” as the mesenchymal, hard tissue component, consisting of enamel and dentin, is intimately admixed with the ameloblastomatous epithelial component.

ORAL AND DENTAL CHANGES IN AN 11-YEAR OLD WITH DYSKERATOSIS CONGENITA INVOLVING MUTATION IN SHELTERIN PROTEIN GENE TINF2 E Ko, C Estilo, J Huryn, Memorial Sloan-Kettering Cancer Center, Dental Service, New York, NY, USA

Dyskeratosis congenita is an inherited bone marrow failure syndrome characterized clinically by the triad of abnormal nails, reticular skin pigmentation, and oral leukoplakia. Originally thought to be solely an X-linked genetic disorder, studies have established that dyskeratosis congenita can have both autosomal dominant and recessive inheritance patterns. Six genes important to telomere functionality have been identified in half of the cases of dyskeratosis congenita. TINF2 encodes a component of the protein sheltering, which provides telomere protection from DNA damage repair mechanisms. Defective telomere maintenance resulting in shortened telomere length is thought to manifest a broad spectrum of related diseases. In addition to the clinical triad mentioned above, abnormal dental changes such as shortened roots and enlarged pulp chambers have been identified. Lastly, patients with dyskeratosis congenita are at a high risk of developing leukemia, solid tumors, and pulmonary fibrosis. We present a case here of an 11-year old boy with dyskeratosis congenita and severe aplastic anemia. Genetic testing confirmed a mutation of the TINF2 gene. Clinically, he presented with the classic triad of abnormal nails, reticular skin pigmentation, and oral leukoplakias, which involved buccal mucosa, gingiva, and the tongue. Panoramic image revealed dental changes that were suggestive of shortened, blunted roots and enlarged pulp chambers.
PIGMENTED ODONTOGENIC LESIONS: REPORT OF AN UNUSUAL CASE AND REVIEW OF THE LITERATURE M Mintline, D Cohen, I Bhattacharyya, M Islam, University of Florida, Gainesville, FL, USA

Melanin pigmentation in intraosseous odontogenic lesions is uncommon and its etiology is unknown. Approximately 50 cases have been reported in the English literature since 1961. The two most common pigmented intraosseous lesions are the calcifying cystic (40%) and keratocystic, odontogenic tumor (16%). Other pigmented intraosseous lesions have rarely been reported. The origin of the melanin in these tumors is uncertain. In the oral cavity, melanocytes are found in the oral mucosa, dental lamina, and tooth bud. Since the vast majority of pigmented intraosseous odontogenic lesions have been reported in African Americans and Asians, researchers suggest that racial pigmentation is an important contributing factor. We report a case of an unusual pigmented dentigerous cyst with lateral periodontal cyst-like features in a 49 year old black female. To the best of our knowledge, this is only the fourth reported pigmented dentigerous cyst ever reported. The etiopathogenesis, histologic, and clinical spectrum of this unusual condition are presented along with a review of the literature.

REMISSION OF PERIPHERAL T CELL LYMPHOMA FOLLOWING A GRAVIOLA DIET C Martínez, B Martínez, M Meneses, University San Sebastián, Santiago, Chile; University Mayor, Santiago, Chile; Fundación Arturo López Pérez, Santiago, Chile

An 89-year-old female patient presented with three smooth surfaced nodules on the dorsum of the tongue, buccal mucosa and back. These nodules have been present for 5 months. The nodular mass on the dorsal surface of the tongue was approximately 4 cm in diameter, painful and it caused difficulties for speaking and eating. The mass on the buccal surface was approximately 2 cm in diameter and asymptomatic. Both nodules were similar in color to the surrounding mucosa the patient medical history was significant for diabetes mellitus type 2, hypertension and hypothyroidism. Biopsy and immunohistological studies of the three nodules showed, among others markers, CD3-positive and CD5, CD4 and CD8-partly-positive. A diagnostic of peripheral T cell lymphoma was made. The patient refused chemotherapy due to her advanced age. Instead, she was advised by a relative to follow a graviola diet. After 14 months no mass were identified by physical examination and the patient referred that the nodules diminished their size after 6 weeks following the graviola diet, being able to eat and speak normally.

SURGICAL CILIATED CYST OF THE MAXILLA SECONDARY TO A PRIOR SINUS EXPOSURE- CASE REPORT AND LITERATURE REVIEW N Amin, T Pustylnik, J Jakabowski, Lake Erie College of Osteopathic Medicine, Bradenton, FL, USA

Surgical ciliated cyst of the maxilla is a relatively rare condition in the United States, but is reported more frequently in Japan as a delayed complication of surgery. It is an iatrogenic cyst which typically develops following trauma or surgery, most commonly a Caldwell-Luc procedure for the treatment of maxillary sinusitis. Due to surgical manipulation, fragments of the sinus lining become entrapped within the bone during the healing process and the lesion begins the formation of an epithelial lined cavity. We report a 53-year-old Hispanic male with a 1 week history of swelling and pain in the upper right quadrant. Intraoral examination revealed an edentulous area in the region of tooth # 3. Ten years earlier, the patient resided in Cuba, where he had undergone a surgical procedure which resulted in the complication of a sinus exposure. Clinical evaluation revealed no TMJ pain and no cervical lymphadenopathy. The lesion measured 6 mm in diameter and spanned from teeth #2 to #5. This ethymatous mass, revealed to be soft to palpation, mildly ulcerated, and exhibited a bluish tint with no associated fistula. Although, a preliminary diagnosis of a cyst or an infection was made and Amoxicillin was prescribed; the patient was advised to undergo a biopsy. The pathology report described the formation of a cyst, internally lined with pseudostratified ciliated columnar epithelium, with chronic inflammatory cells scattered within the cyst wall. Given the histopathological appearance, the diagnosis of surgical ciliated cyst of the maxilla was made. Conservative surgical enucleation was the treatment of choice.

A CASE OF HERPES ASSOCIATED ERYTHEMA MULTIFORME K Davis, K Davis, C Smith, O Esaruso, M Williams, L Halpenn, B Ballard, Meharry Medical College Nashville, TN, USA

A 20-year-old black female presented complaining of bleeding to her lips and “canker sores” inside her mouth as well as a rash to her hands and elbows. First intraoral lesion was noticed to the upper inner lip mucosa 12 days prior to clinic presentation and the rash one week later. The ulcerations started getting progressively worse with more lesions appearing followed by swelling of her lips. On clinical exam, there is generalized erythema throughout the oral cavity. The buccal mucosa is markedly erythematous with hyperkeratotic, white, plaque-like lesions present bilaterally. 1-2mm sized ulcerations are present to both the hard and soft palate on erythematous bases. Extra orally, variably sized tender & erythematous blisters are noted to the palmar surfaces of the hands. Violaceous plaques, macules, & blisters of various sizes to the extensor surfaces of the hands, forearms, and elbows. PMH: Similar episode 6 months prior otherwise non-contributory PSH: none SH: Denies any history of tobacco, alcohol, IV drugs, or illicit drugs. Medications: Clindamycin 300mg po every 6 hours x 7 days and Aycylovir 800mg po 5 times daily x 7 days Differential Diagnosis: Pemphigoid Vulgaris, Dermatitis Herpetiformis, Pemphigus, Gingivostomatitis. We present a case of a young woman with herpes simplex associated erythema multiforme.

BRAFV600E POSITIVE LANGERHANS CELL HISTIOCYTOSIS: PRESENTATION OF A CASE A Yancoskie, B Shipzner, A Williamson, J Fantasia, Hofstra North Shore-LIJ School of Medicine, New York, NY, USA

Background: Langerhans cell histiocytosis (LCH) is characterized by infiltrates of CD1a positive cells, similar to antigen presenting cells of the epidermis. Disease may be solitary or multifocal involving various anatomic sites including skin, mucosa, bone, lymph nodes, soft tissue, and organs. LCH occurs over a wide age range, yet is most commonly identified in the pediatric population. Historically, debate has focused on LCH as a neoplastic or reactive phenomenon. Willman and colleagues, in 1994, provided evidence that LCH was a clonal proliferation using the X-linked human androgen-receptor gene molecular assay. Recent studies have identified the BRAFV600E mutation in 38-69% of LCH cases. This is supportive of a neoplastic process.
Objective: To report the clinical, radiographic, pathological and genetic findings in a case of LCH.

Observation: A two-year-old male presented to the emergency department with left sided facial swelling of one-week duration. Magnetic resonance imaging and computed tomography studies demonstrated multiple soft tissue masses and osteolytic lesions including foci in the craniofacial region. A diagnosis of LCH was established based on histopathology and immunohistochemical phenotyping of a cervical lymph node. Tissue was further analyzed for the BRAFV600E mutation.

Results: The BRAFV600E mutation was identified. The BRAFV600E mutation has been observed in several entities including Erdheim-Chester disease, ameloblastoma, melanocytic nevi, melanoma, and a variety of other cancers. Therapeutic implications for patients with BRAFV600E positive LCH are under investigation.

CASE REPORT: CHONDROMYXOID FIBROMA OF MANDIBLE

D Chandra, R Kelsch, R Kraut, NorthShore-LIJ Health System, New Hyde Park, NY, USA; Montefiore Medical Center, Bronx, NY, USA

Background: Chondromyxoid fibromas are uncommon benign neoplasms of bone that represent less than one percent of all bone tumors. They are most often found in the bones of the extremities and very rarely in the jaws with only 25 reported cases. Histologically, these lesions are characterized by lobules of spindle-shaped or stellate cells within a chondroid and myxoid matrix.

Case description: A 39-year old male presented with an asymptomatic unilocular radiolucent lesion with irregular borders in the right mandibular canine/premolar area with buccal bone expansion and erosion. The lesion was identified as an incidental finding. Teeth tested vital. The lesion was excised in toto and the findings were consistent with chondromyxoid fibroma.

Conclusion: The current case of chondromyxoid fibroma exhibited the clinical, radiographic and histologic features characteristic of this process. However, given the chondroid and myxoid stroma the differential diagnosis would include cartilaginous neoplasia such as chondrosarcoma and myxoid neoplasms such as myxoma and chondromyxosarcoma. Etiology and pathogenesis is undetermined though rearrangements in chromosome 6 have been suggested. Reported treatments have consisted of enucleation with or without curettage and enbloc resection, which have all been successful with rare recurrence. Awareness of this rare, benign jawbone entity is relevant to the practicing OMFP given the significant differential diagnosis and focal histologic overlap with benign and malignant neoplastic processes.

LOCALIZED JUVENILE SPONGIOTIC GINGIVAL HYPERPLASIA (LJSGH) FEATURING UNUSUAL P16INK4A LABELING AND NEGATIVE HPV STATUS BY POLYMERASE CHAIN REACTION (PCR) P Argyris, A Nelson, S Papanakou, S Merkourea, K Tosios, I Koutlas, University of Minnesota, Minneapolis, MN, USA; University of Athens, Athens, Greece

Background: LJSGH represents a distinct type of gingival hyperplastic lesion with specific clinicopathologic features. Evaluation of the morphological characteristics of LJSGH indicates the potential role of HPV infection as an underlying etiopathogenetic mechanism.

Materials and methods: All cases diagnosed as LJSGH during the period 2008-present were retrieved. Clinical and demographic data were collected. HPV status was assessed by p16INK4A immunohistochemistry and PCR using MY09/11 primers for the L1 conserved region of the HPV genome and human beta-globin as an internal control.

Results: Twenty-one LJSGHs were identified (M:F = 2:1, age range: 8-36 years, mean:13 years). All lesions were well-differentiated, exophytic, erythematous with granular or slightly papillary surface and a preponderance for the maxillary gingiva (19/21). The mean follow-up period was 18.7 months. Two cases recurred 20 and 21 months after excision. Histopathologically, LJSGHs featured epithelial hyperplasia with intense neutrophilic exocytosis and spongiosis. All 21 cases demonstrated positive immunostaining for p16INK4A with the majority of the specimens intensely decorated for p16INK4A in >50% of the overlying epithelium. Focal or diffuse immunostaining pattern was observed in 47.6% and 52.4% of the lesions, respectively. Thirteen cases were negative for HPV DNA by PCR, 5 cases lacked beta-globin amplification and were classified as insufficient for analysis while 2 were suspicious for HPV but limited DNA quantity impeded further typing. Interestingly, the last case displayed positivity for HPV-31.

Conclusions: HPV does not participate in the pathogenesis of LJSGH. The observed expression of p16INK4A in the absence of HPV-PCR confirmation can be attributed to intense inflammation.
MAML2 REARRANGEMENTS IN ODONTOGENIC CYSTS WITH MUCOUS METAPLASIA: AN INSIGHT IN THE PATHOGENESIS OF INTRAOSSEOUS MUCOEPIDERMOID CARCINOMA

P Argyris, J Garcia, R Wehres, I Koutras, University of Minnesota, Minneapolis, MN, USA; Mayo Clinic, Rochester, MN, USA

Background: The pathogenesis of intraosseous mucoepidermoid carcinoma (IMEC) remains unknown. Coexistence with odontogenic cysts (OCs) has been reported in 32-48% of IMEC suggesting a possible etiopathogenetic mechanism. Metaplastic mucous cells seen in the epithelial lining of OCs may support such a theory. The MECT1-MAML2 fusion transcript is a well-established genetic signature of 66% of MECs.

Aim: To investigate the presence of MAML2 rearrangements in OCs with mucous metaplasia.

Materials and methods: Ten cases of OCs with prominent mucous cell component and 3 cases diagnosed as IMEC were evaluated for the presence of MAML2 rearrangement using a MAML2-11q21 break-apart FISH probe. The clinical cutoff defining positivity was at 10%.

Results: All OCs and IMECs occurred in the mandible. The former exhibited an M:F ratio of 2.3:1 (mean age 48.6 years) while all IMECs occurred in women (mean age 55 years). All 3 IMECs exhibited MAML2 rearrangement by FISH in 26-61% of cells. Successful hybridization was observed in 9/10 cases of OCs with mucous metaplasia. Among them, 2/9 were remarkable for MAML2 rearrangement in 12 and 24% of the cystic lining epithelial cells, respectively, and 3/9 albeit not fulfilling our criteria for positivity, showed rearrangement in 7-8% of cells. The remaining 4/9 cases were entirely negative.

Conclusions: We identified MAML2 rearrangements in 56% of OCs with mucus-secreting cells. This finding suggests that a subset of OCs with mucous metaplasia may represent early malignant transformation towards IMEC.

ORAL PEMPHIGOID WITH EXTENSIVE OCULAR INVOLVEMENT: A CASE REPORT

MA Dahawi, S Shah, D Patel, A Kerr, New York University, New York, NY, USA

Background: Mucous membrane pemphigoid (MMP) is a chronic blistering autoimmune disease in which autoantibodies are directed against components of the basement membrane. It affects mostly the oral mucosa but ocular and genital mucosa may also be involved. MMP affects the elderly population with a female predilection. It often presents in the oral cavity as a desquamative gingivitis with rarely seen bullae. Treatment of MMP is often individualized and varies from topical to systemic immunosuppressive drugs. We will present a case of a female patient with MMP and extensive ocular involvement.

Case: A 57-year-old female patient with asthma was referred to evaluate and treat a persistent desquamative gingivitis. The case was challenging as the patient only spoke Spanish and was severely mentally impaired. Extra-oral exam revealed erythema, ulceration, and symblepharon of bilateral ocular mucosa but no skin lesions. The patient claimed that her eye doctor said she had a bacterial infection and was given eye drops. Her intra-oral exam showed erythematous desquamative gingivitis with a positive Nikolsky sign. A biopsy was performed and sent for microscopic exam and direct immunofluorescence (DIF). The H&E biopsy showed non-specific ulcer while the DIF reported a definitive diagnosis of pemphigoid. She was treated with prednisone doses that have been gradually tapered and both oral and ocular symptoms have significantly improved.

ORAL AND MAXILLOFACIAL PATHOLOGY

ORAL AND MAXILLOFACIAL PATHOLOGY

Conclusion: This case demonstrates the importance of recognizing other more serious diseases related to the gingiva and oral mucosa. It also shows the important role of a dentist in performing an extra-oral exam and discussing abnormal findings with the appropriate medical specialist. Finally, the role of DIF in making the correct diagnosis is emphasized.

MULTICYSTIC DISEASE OF THE NECK I Elimairi, A Elimairi, A El Hassan, W Elamin, The National Ribat University, Khartoum, Sudan; Nile College, Khartoum, Sudan; University of Medical Sciences and Technology, Khartoum, Sudan; University of Khartoum, Khartoum, Sudan

A 49-year-old women presented with a Multicystic Neck Lesion of several years duration. Routine hematologic and biochemical examinations, including thyroid hormonal evaluation, were within normal limits. FNAC from the anterior neck mass showed hyp cellular aspirate with clumps of mononuclear cells with heterogeneous and primitive nuclei and vacuolated deep basophilic cytoplasm which is consistent with a malignant lesion. Cultures were negative for aerobic and anaerobic bacteria. The upper anterior neck and the supraclavicularly lateral neck cysts both showed the appearances of a papillary thyroid carcinoma with occasional psammoma bodies seen. The tumor is infiltrating the surrounding muscle. The cystic mass in the middle of the chain (level III and IV) is lined by more than one layer of columnar epithelium. The wall of the cyst is infiltrated by lymphoid tissue diffusely or in form of follicles with prominent germinal centers. Some of the germinal centers contain tangible bodies usually encountered in the reactive lymphoid follicles. The follicles are positive for the B cell marker CD20. The area between follicles is positive for the T cell marker CD3. The sections are negative for BCL2 which excludes a follicular lymphoma. Diagnosis: Papillary thyroid carcinoma, lymphoepithelial cyst, and metastatic lymph node with cystic degeneration. In summary: An unusual case of synchronous papillary thyroid carcinoma and lymphoepithelial cyst (LEC) is reported in a patient without any identified environmental risk or predisposing factors. The metastatic lymph node was found in a cystic form and located supraclavicularly inferior to the LEC.

NF-KB AND IL-6 IMMUNOHISTOCHEMICAL EXPRESSION IN ORAL PREMALIGNANT AND MALIGNANT LESIONS

G Kamperos, NG Nikitakis, A Sfakianou, A Sklavounou, University of Athens, Greece

Objective: Recent evidence suggests a molecular crosstalk between IL-6 and NF-κB signaling pathways in oral squamous cell carcinoma (SCC). The purpose of this study was to evaluate the immunohistochemical expression of NF-κB and IL-6 in oral malignant and premalignant lesions.

Findings: Forty five oral cases comprising 4 normal mucosal controls, 11 hyperplasias, 21 dysplasias of various degrees and 9 SCCs were investigated. Immunohistochemical staining with NF-κB (p65) was performed and the intensity and percentage of positive epithelial cells were graded in a semiquantitative manner, in a scale of 0-3 for each parameter; a combined total score was also calculated (0-6). NF-κB expression was noted in all cases in both cytoplasm and nucleus of epithelial cells. The average total scores were 4.25 for normal mucosa, 4.5 for hyperplasias, 5.33 for dysplasias and 5.22 for SCC, respectively. The total scores in dysplasias and SCCs were higher than those in hyperplasias (p=0.041). Immunohistochemical staining for IL-6 was also performed and each case was characterized as...
positive or negative. IL-6 had a mild cytoplasmic staining in a few subepithelial inflammatory cells and in the adjacent epithelial cells of the basal or parabasal layer. IL-6 expression in the epithelial cells was detected in 2/11 (18.18%) of hyperplasias and 4/18 (22.22%) of dysplasias, whereas no positive case was detected for normal mucosa and SCC. Statistical correlation between the presence of subepithelial inflammatory infiltrate and the IL-6 expression in epithelial cells was detected (p<0.05). There was no correlation between NF-κB and IL-6 expression.

Conclusion: NF-κB and IL-6 signaling pathways may be activated in the early stages of oral carcinogenesis.

NON-NEURAL GRANULAR CELL TUMOR OF THE ORAL CAVITY W O’Neill, J Kalmar, C Allen, The Ohio State University, Columbus, OH, USA

Classic granular cell tumors (GCTs) show strong cytoplasmic and nuclear expression of S100 and are believed to be of neural or Schwannian origin. We report a case of intraoral GCT that was negative for S100 but strongly positive for expression of CD10. A 52-year-old woman with a history of hypertension, diabetes, and hypothyroidism presented with an ulcerated, sessile, 1 cm nodule of the left buccal mucosa. The clinical diagnosis was “traumatic fibroma”. Microscopic examination revealed ulcerated fibrovascular connective tissue that contained a cellular population of large, ovoid cells with round, euchromatic nuclei and granular cytoplasm. Pleomorphism was not observed and mitoses were rare. Acute and chronic inflammatory cells were noted throughout the lesion with focal germinal center-like aggregates in the deeper connective tissue. Occasional binucleated and multinucleated cells, including Touton giant cells, were observed. Immunohistochemical studies revealed the lesional cells to be negative for S100 protein, CD1a, Melan-A, HMB-45, synaptophysin, smooth muscle actin and cytokeratins. CD163 and Factor XIIIa expression was identified among interspersed dendritic cells consistent with histioocytes, however, the granular cells were negative. Lesional cells demonstrated uniformly strong expression of CD10. Besides congenital epulis of the newborn, intraoral examples of non-neural GCT have rarely been described. Non-neural GCT is a diagnosis of exclusion based largely upon immunohistochemical findings and we cannot completely exclude the possibility that this lesion might represent a variant of fibrous histiocytoma.

PEMPHIGUS VULGARIS PRESENTING AS GINGIVAL HYPERTROPHY IN A CHILD C Haberland, M Johnson, M Tomayko, Yale-New Haven Hospital, New Haven, CT, USA; Yale School of Medicine, New Haven, CT, USA

Pemphigus vulgaris is a mucocutaneous autoimmune disease caused by autoantibodies against the desmosomal proteins desmoglein 3 and desmoglein 1. Oral pemphigus vulgaris has rarely been reported to occur in children and adolescents. A current literature review reported 50 cases, 7 of which presented with oral lesions exclusively. Oral lesions of pemphigus commonly present as vesicles or bullae that ulcerate easily and occur most frequently in the buccal, palatal and labial mucosa. Gingival lesions usually present as desquamative gingivitis. We report a case of a healthy 17-year old Hispanic female, taking no medications, who presented with an 8-year history of gingival hypertrophy and no other oral, skin or other mucosal lesions. Clinically she had severe gingival hypertrophy affecting both the facial and lingual surfaces and covering most of the clinical crowns. The surface epithelium appeared eroded in areas and the tissues bled easily. Surgical excision of all hypertrophied gingival tissue was done in the operating room. The final diagnosis on light microscopy was inflammatory hyperplasia and anacantholysis. Direct immunofluorescence showed intercellular deposition of IgG and C3 and indirect immunofluorescence showed IgG positive intercellular staining a 1:80 dilution. Testing for serum antibodies against desmoglein 1 and 3 however was negative. After further evaluation with dermatologist, a diagnosis of atypical pemphigus vulgaris was made. Only 2 other reported cases of pemphigus vulgaris have presented with oral nodules or masses but none exclusive to the gingiva. This is the first documented case of pemphigus vulgaris presenting as gingival hypertrophy in a child without any other mucosal or skin lesions.

PRIMARY MUCOEPIDERMOID CARCINOMA ARISING FROM ECTOPIQUE SALIVARY TISSUE WITHIN AN INTRAPAROTID LYMPH NODE F Faras, F Abo-Alhassan, J Bastaki, M Al-Shan, Arabian Gulf University, Kuwait; Kuwait University, Kuwait; University of Pittsburgh, PA, USA; University College Dublin, Ireland

Ectopic salivary tissue is commonly found in intraparotid and periparotid lymph nodes. Warthin’s tumor is the most common tumor arising in ectopic salivary gland tissue, and is found more often in intraparotid lymph nodes. Although rare, neoplastic transformation of the ectopic salivary tissues is conceivable and other types of salivary gland neoplasms arising in intraparotid lymph nodes have been reported. Herein we report a rare case of mucoepidermoid carcinoma (MEC) arising from ectopic salivary tissue in an intraparotid lymph node. A 32-year-old Kuwaiti Caucasian presented with a mass in the right parotid gland. Fine needle aspiration cytology was performed pre-operatively and suggested Warthin’s tumor. The patient subsequently underwent a superficial parotidectomy. The specimen showed a well-circumscribed, thinly encapsulated, solid, tan mass within the parotid parenchyma abutting the deep margin. Hematoxylin and Eosin stained sections of the lesion showed solid islands and cysts composed of epidermoid cells, mucus cells and intermixed smaller “intermediate” cells within an intraparotid lymph node. The tumor was seen infiltrating the parotid parenchyma at the deep margin. Metastasis from distant sites was ruled out clinically, and the diagnosis rendered was mucoepidermoid carcinoma, low-grade, arising from ectopic salivary tissue in an intraparotid lymph node. Such cases are extremely rare and the presence of malignancies within lymph nodes may pose a diagnostic pitfall, which can affect patient management.

PSEUDOXANTHOMA ELASTICUM: A RARE ENTITY PRESENTING IN THE MOUTH R Menon, S Almazrooa, J Lambe, W Youseff, S Kabani, Harvard School of Dental Medicine, Boston, MA, USA; StrataDx Inc, Lexington, MA, USA; Oral and Maxillofacial Surgeon, Milford, MA, USA

Pseudoxanthoma elasticum (PXE) is an inherited disorder of abnormal calcification of elastic fibers mainly in the skin, retina and cardiovascular system. Other systemic involvement can occur. It is caused by a mutation in ABCC6 gene that encodes Multidrug resistance associated protein 6 (MRP6). In the literature, the oral mucosa was rarely involved and if involved, it is in combination with systemic manifestations. They can present as yellow macule/s in the palate or labial mucosa. Other reported oral symptoms include Sjogren-like features, dental impactions and amelogenesis imperfecta. Herein we report a case that presented solely with oral lesions. A 77-year old male presented to the dentist with asymptomatic
bilateral yellow lesions on the soft palate that was found incidentally on dental exam. His medical history includes hyperlipidemia, benign prostate hyperplasia, cataract and occasional HSV skin infection. He reported brown crusty spots on his skin due to aging. His brother and sister have similar brown spots on the skin. He is on pravastatin, valacyclovir and vitamin D supplements. He has no known allergies. He has a twin brother who had gastrointestinal cancer and was treated for it. His mother died from heart problems and his father died from brain cancer. Biopsy of the palatal lesions showed a localized collection of fragmented clumped basophilic fibers within the connective tissue. These fibers stained positive with elastic stain and Von Kossa stain. The histopathologic diagnosis was consistent with PXE. Presentation of PXE in the mouth is uncommon and if it occurs, it should initiate systemic investigation for other symptoms and close follow up of the patient.

RENA L OSTEODYSTROPHY OF THE MANDIBLE: A CASE REPORT S Shah, E Mohammed, K Chan, H Talib, New York University College of Dentistry, New York, NY, USA

Introduction: Renal osteodystrophy refers to bone diseases that result from the abnormal metabolism of calcium, phosphate and bone secondary to kidney disease and secondary hyperparathyroidism. In this report, we present a patient with generalized mandibular enlargement of unknown origin that was eventually diagnosed with underlying kidney disease.

Case summary: A 23-year-old black male presented with a chief complaint of pain related to his lower third molars. He reported a medical history significant only for hypertension and was taking Norvasc and clonidine. He exhibited painless generalized mandibular enlargement. A panoramic radiograph was taken and revealed a diffuse “ground-glass” trabecular bone pattern. The clinician ordered a CT scan and blood work to rule out any systemic diseases. The patient returned 2 months later with pain related to the right lower third molar. He reported that he had recently started dialysis and was now diagnosed with focal segmental glomerulosclerosis and secondary hyperparathyroidism. The lower right third molar was extracted and tissue was curetted from the socket and submitted for histology. The biopsy specimen showed cellular fibrous connective tissue admixed with irregularly shaped viable bone trabeculae with a small focus of multinucleated giant cells. A diagnosis of benign fibro-osseous lesion consistent with renal osteodystrophy was rendered.

Conclusion: This case shows how an unknown systemic disease can present with an oral manifestation that can lead to its diagnosis. This patient’s generalized mandibular enlargement with diffuse “ground-glass” radiographic changes was an oral manifestation of underlying metabolic kidney disease. Early diagnosis made by dentists will minimize the morbidity associated with this condition.


Chondrosarcoma to the head and neck region is an uncommon event, representing 1% to 12% of all chondrosarcoma cases. When present, a vast majority of chondrosarcomas manifest in the bony skeleton (59.7%). The laryngotracheal cartilage (23.4%); soft tissue of the head and neck (11.2%); and separate anatomic locations such as the oral cavity, pharynx, tongue, and orbit (5.8%) make up the remaining distribution. With regard to oral cavity tumors, patients may present with complaints of swelling, pain, tooth mobility or occlusal discrepancy. If the temporomandibular joint (TMJ) is affected, additional symptoms may include trismus or hearing loss. Although rare, the surgeon and specialist must be aware of this phenomenon and be prepared to understand the potential therapeutic challenges associated with management. This paper describes a case of chondrosarcoma to the TMJ in a 53-year-old female veteran who presented with left facial swelling. Computed tomography demonstrated an expansive and destructive lesion of the left TMJ and condylar head. An open biopsy revealed a grade III/III chondrosarcoma of the left TMJ. She was treated primarily with composite resection of the right mandibular condyle and temporal bone along with superficial parotidectomy with facial nerve preservation and delayed reconstruction to improve tumor surveillance. Adjuvant intensity-modulated radiation therapy (IMRT) of 6000 cGy was administered following her resection. She is remains disease free at 18 months postoperatively. Chondrosarcoma to the TMJ presents a complex problem to the surgeon and clinician. A combined, multi-disciplinary approach may be necessary to effectively treat and monitor the disease as well as restore form and function to the patient.

SMARTPHONE TELEMEDICINE: IMPROVING DIAGNOSIS CONSULTATION AND TREATMENT PLANNING P Devilliers, M Fuentes, J Holmes, L Miller, Pathology Associates of Alabama, Birmingham, AL, USA; Baptist Health, Montgomery, AL, USA; Clark Holmes Oral Facial Surgery, Birmingham, AL, USA

Smartphone telemedicine can be an efficient and effective way for remote Oral Pathology consultation. There are no reports to date, on the impact of smartphone telemedicine on the interaction of Oral Pathologists with multidisciplinary clinicians. A primary care physician has about 10 minutes to provide a clinical examination and formulate a treatment plan. In the past, under the presence of a suspicious oral lesion, the patient would be initially medicated with antifungal, antibiotics and antivirals; a few weeks later, when lesion did not resolve, the patient would be referred to a specialist for further evaluation. Today, a primary care physician can take a photograph of an oral lesion with a smartphone and send it to the oral pathologist with a description of signs and symptoms and medical history; the oral pathologist makes an assessment of the information and guides the clinician accordingly. Use of smartphone telemedicine in developing an accurate preliminary diagnosis is a great tool that can save a patient’s life. To illustrate this process we present cases, such as that of a 34 year old patient with lesion of the buccal mucosa which was photographed by the primary care physician, assessed by the oral pathologist and within a couple of weeks patient underwent resection of a T2N1M0 squamous cell carcinoma by the oral and maxillofacial surgeon. Without the use of smartphone telemedicine, the diagnosis and treatment would have been greatly delayed. To function effectively, it is crucial for smartphone telemedicine to include the participation of a multidisciplinary network. It is also very important for the oral pathologist to interact directly with primary care physicians.

THE PREVALENCE OF ORAL LESIONS IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE A Kiyani, CM Allen, KK McNamara, FM Beck, R Arsenescu, The Ohio State University, Columbus, OH, USA
THE DIAGNOSTIC ROLE OF KERATIN 6, 7, 8, 14, 16, 18, 19 IN MELANOMA AND UNDIFFERENTIATED TUMORS OF THE ORAL AND MAXILLOFACIAL REGION R Safadi, D Bader, M Sughayer, Jordan University of Science and Technology, Irbid, Jordan; Ministry of Health, Jordan; King Hussein Cancer Center, Amman, Jordan

Objective: To investigate the role of keratins as an aid to exclude melanoma from its mimics in the head and neck region.

Materials and Methods: Immunohistochemical expression of K6, K7, K8, K14, K16, K18, K19 was studied in 29 oral and maxillofacial melanomas (4 oral mucosal, 17 cutaneous, 11 metastatic), 6 neuroendocrine carcinomas (NEC), 7 neuroblastomas (NB), 6 sinonasal undifferentiated carcinomas (SNUC), 15 undifferentiated nasopharyngeal carcinomas (UNPC), 19 anaplastic large cell lymphomas (ALCL), 16 poorly differentiated squamous cell carcinoma (PDSCC), and one case of Ewing’s sarcoma (ES). Stained sections were reviewed using light microscope for pattern and intensity of expressions. Results were statistically analyzed using Fisher’s exact test.

Results: All of the studied keratins were expressed in varying extents in melanoma except K6. K6 was positively expressed in NEC, NB, UNPC, and PDSCC. K7 was positively expressed in melanoma, NEC, SNUC, UNPC, PDSCC but negative in NB, ALCL and ES. K8 was positive in all study groups except ALCL and ES. K14 was positive in melanoma, SNUC, UNPC, PDSCC, ES and negative in NEC, NB, and ALCL. K16 was positive in melanoma, UNPC, PDSCC. K18 and K19 were positive in all groups except ALCL and ES. Keratin expression was observed more in metastatic melanoma compared to primary melanoma with statistically significant difference for K8 and K18. K14 and K16 expressions were significantly higher in PDSCC compared to the other groups. ALCL was negative for all studied keratins.

Conclusion: Positive keratin expression in an undifferentiated neoplasm should not exclude the diagnosis of melanoma. Metastatic melanoma is more capable of expressing keratins compared with primary melanoma.

FINDING AND VISUALIZING INFORMATION ABOUT POTENTIAL PROGNOSTIC BIOMARKERS OF ORAL SQUAMOUS CELL CARCINOMA: A PATHOLOGY INFORMATICS STUDY J Frazier, C Stein, E Tseytlin, K Mitchell, T Bekhuis, Department of Biomedical Informatics, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

Background: The impressive growth in the biomarker literature poses a serious barrier to finding information. E.g., it is increasingly difficult to find relevant studies on potential prognostic biomarkers of oral squamous cell carcinoma (OSCC) as simple keyword searches retrieve too many irrelevant studies. Pathology informatics can address this problem by using natural language processing (NLP) and information extraction and retrieval methods to build tools. Evaluating NLP tools typically involves testing against a ‘gold standard’ corpus. In many informatics problems, a gold standard does not exist and its creation is a necessary first step. This study describes the creation of a gold standard corpus about studies on potential prognostic biomarkers in OSCC, as well as a novel tool for viewing content.
Methods: Two annotators screened titles and abstracts of prognostic studies of OSSC retrieved from MEDLINE. We developed a guideline to aid identification of a subset of prognostic biomarker studies, which we labeled as relevant. Calibration trials preceded annotation of the corpus. We measured inter-annotator agreement (IAA) using Cohen’s kappa.

Results: We retrieved 1818 citations. Three calibration trials involving screening 51 citations (2.8%); after IAA stabilized, we screened the remaining corpus (n = 1767; 97%; 8 = 0.76). The gold standard corpus has 497 (27%) relevant citations. Our group also developed the EDDA Lens to view various aspects of the corpus, including open access images.

Conclusion: We developed a gold standard corpus with studies about potential prognostic biomarkers of OSCC and a prototype for viewing content. This was an important first step towards development of informatics resources to meet the information needs of pathologists and researchers.

MOLECULAR SIGNATURE FOR PREDICTING RISK OF CANCER DEVELOPMENT IN ORAL LESIONS WITH DYSPLASIA
A Matta, G Srivastava, J Assi, I Leong, I Witterick, C MacMillan, R Ratihan, Alex and Simona Shnider Laboratory in Molecular Oncology, Mount Sinai Hospital, Joseph & Wolf Lebovic Health Complex, Toronto, Ontario, Canada; Department of Pathology & Laboratory Medicine, Mount Sinai Hospital, Joseph & Wolf Lebovic Health Complex, Toronto, Ontario, Canada; Department of Otolaryngology - Head and Neck Surgery, Mount Sinai Hospital, Toronto, Ontario, Canada

Identification of oral lesions with dysplasia at high risk of malignant transformation remains a major clinical challenge. It is of utmost importance for identifying patients in whom early intervention will lead to more effective disease management. Currently, there are no biomarkers that can be used in clinics to predict these high risk lesions. There is an urgent clinical need for biomarkers that allow identification of high-risk oral lesions. We identified and verified five potential markers- S100A7, prothrombin, 14-3-3, heterogeneous nuclear ribonucleoprotein K (hnRNPK) and 14-3-3A and heterogeneous nuclear ribonucleoprotein K (hnRNPK) using proteomics to distinguish oral lesions with dysplasia and oral cancers from normal oral tissues. We evaluated their potential for identification of oral dysplasia at high-risk of cancer development. Using immunohistochemistry, expressions of S100A7, prothrombin, 14-3-3, 14-3-3A, hnRNPK and p16 (a surrogate marker for HPV) were analyzed in 110 patients with oral dysplasia and known clinical outcome over ten years of follow up. Cancer-free survival was determined using Kaplan-Meier survival analysis and significant factors were identified by Cox regression multivariate models. Cytosplasmic S100A7 overexpression emerged as the most significant candidate marker associated with cancer development in dysplastic lesions (p = 0.041, Hazard’s ratio = 2.36). The performance of S100A7 was further improved using a panel of proteins that constitute a molecular signature for predicting risk of cancer development in oral lesions with dysplasia with high sensitivity and specificity. Our molecular signature is likely to find utility in clinical practice for predicting patients having oral lesions with dysplasia who are at high risk of cancer development.

METASTATIC CARCINOMAS TO MANDIBLE AND MAXILLA. REPORT OF SEVEN CASES
I Velez, Nova University College of Dental Medicine, Fort Lauderdale, FL, USA

Metastatic tumors to the oro-facial region are rare and may occur in soft tissues or bone. In the mandible and maxilla, metastases appear more often than primary malignancies. In 25% of cases the metastasis is the first sign of malignant disease. Lung, breast, kidney, colon, prostate and thyroid carcinomas are reported as the most common metastatic diseases to the area, specially, breast in women and lung in men. The clinical presentation of metastatic lesion to mandible or maxilla can be variable leading to misdiagnosis of a benign process. In general, an early metastasis to the maxillofacial complex is asymptomatic. Therefore, a biopsy is mandatory in patients with a known history of carcinoma and a non-diagnosed mandible/maxilla radiolucent or mixed lesion. We report seven cases from NOVA Oral pathology department with the purpose to provide awareness about metastatic tumors to the jaws.

PEAU D’ORANGE MUCOSA: A CLINICAL PEARL FOR IDENTIFICATION OF POLYMORPHOUS LOW-GRADE ADENOCARCINOMA? A Chi, B Neville, Medical University of South Carolina, Charleston, SC, USA

Background: The clinical presentation of polymorphous low-grade adenocarcinoma (PLGA) is relatively non-specific. We have observed cases in which the overlying mucosa has exhibited a finely stippled, slightly papillary, or “peau d’orange” appearance. Microscopic examination of such cases exhibits slightly pebbly to markedly papillary hyperplasia of the surface epithelium, with tumor often infiltrating just beneath the epithelium.

Objectives/Study design: In order to assess how frequently this type of papillary epithelial hyperplasia may be found in association with various minor salivary neoplasm types, we conducted a retrospective clinicopathologic review of archived cases of PLGA, adenoid cystic carcinomas (ACC), mucoepidermoid carcinomas (MEC), and pleomorphic adenomas (PA) of the oral cavity and oropharynx.

Results: Among cases in which surface epithelium was present for evaluation, the frequency of marked papillary epithelial hyperplasia was slightly pebbly surface epithelium, and no surface epithelial change for each tumor type was as follows: PLGA (n=23) 35%, 26%, 39%; ACC (n=18) 0%, 44%, 56%; MEC (n=17) 0%, 41%, 59%; PA (n=28) 0%, 46%, 54%. Among these cases, the most common site of involvement was the palate (PLGA 85%, ACC 59%, MEC 65%, PA 86%). The sensitivity and specificity of marked papillary epithelial hyperplasia for PLGA were 35% and 100%, respectively.

Conclusions: Marked papillary epithelial hyperplasia was present in only a small proportion of PLGA. However, our findings suggest that when present within the context of a palatal salivary neoplasm, papillary epithelial hyperplasia may be highly specific for PLGA. Accordingly, peau d’orange mucosa may represent a useful clinical clue for identification of PLGA.

THE EXPRESSION OF CELL ADHESION MOLECULE (CD44) IN MUCOEPIDERMOID CARCINOMA AND ITS PROGNOSTIC VALUE
N Binmadi, A Elsissi, N Elsissi, King Abdulaziz U, Jeddah, Saudi Arabia; University of Mansoura, Egypt

Abstract: The most common malignant salivary gland tumors that affect both adult and children is mucoepidermoid carcinoma (MEC). It usually affects both minor and major salivary glands but parotid gland is considering the most common site in which this tumor arises. Histologically, MECs are composed of epidermoid, mucous, and intermediate cells and graded to low,
intermediate, and high according to one of the following grading systems: modified Healey system, the AFIP grading system, and Brandwien system. This grade scheme for MEC is important to determine the tumor progression and patient management. A total of 15 cases of MECs will be evaluated immunohistochemically for CD44 expression. CD44, a trans-membrane glycoprotein, is an adhesion molecule of cell surface that play a role in the connections between cell-cell and cell-matrix. Many malignant tumors express high levels of CD44 like breast and prostate cancer, thus, CD44 may be used as an indicator of aggressive behavior of some human malignancy. However, the role of CD44 in MEC remains unclear. The purpose of the present study is to evaluate the immunohistochemical staining of CD44 in different grades of mucoepidermoid carcinoma (MEC). This result will further correlate with clinicopathological data to determine if this staining can predict the tumor biological behavior.

CLEAR CELL VARIANT OF ORAL SQUAMOUS CELL CARCINOMA M Romañach, N Canedo, E Cortezzi, A Abrahão, M Cabral, M Agostini, Federal University of Rio de Janeiro (UFRJ), Brazil

The clear cell variant of squamous cell carcinoma (CCSCC) was recently first described in the oral cavity by Frazier et al. (2012), as an infiltrating gingival tumor predominantly composed of epithelial cells with clear cytoplasm containing glycogen. We present a single case of CCSCC in a 60-year-old female patient. The lesion was noted 4 months before the first consult and clinical examination revealed a 4 x 3 cm asymptomatic ulcerated swelling in the posterior buccal mucosa extending to the soft palate. Microscopically, tumor islands with cellular pleomorphism and mitotic figures exhibited central epithelial cells with clear appearance. The glycogen intracytoplasmic content was confirmed after periodic acid Schiff staining. By immunohistochemistry, the tumor cells were positive for CK AE1/AE3 and p63, and negative for vimentin and CD10. The final diagnosis was of clear cell variant of oral squamous cell carcinoma. The patient was submitted to surgical removal and adjuvant radiotherapy. Local recurrence was observed 6 months after the surgery with no signs of regional metastasis. Currently, there is no sign of recurrence 12 months after the second surgery. It is the second reported case of CCSCC of the oral cavity. The study of large series of CCSCC cases are necessary to clarify whether clear cells are important for the prognosis or only represent an additional microscopic detail.

B-CELL LYMPHOMA, UNCLASSIFIABLE, WITH FEATURES INTERMEDIATE BETWEEN DIFFUSE LARGE B-CELL LYMPHOMA (DLBCL) AND BURKITT LYMPHOMA (BL): A REPORT OF 5 CASES IN THE ORAL CAVITY A Owosho, E Bilodeau, F Craig, University of Pittsburgh, PA, USA

Background: The 4th edition of the World Health Organization (WHO) Classification of Tumors of Hematopoietic and Lymphoid Tissues introduced the category of B-cell lymphoma, unclassifiable, with features intermediate between DLBCL and BL (DLBCL/BL). DLBCL/BL includes a subset of double/triple-hit B-cell lymphomas (with rearrangements of both MYC/8q24 and BCL2/18q21 and/or BCL6/3q27). DLBCL/BL has high-grade morphologic features which includes the presence of many mitoses, abundant apoptosis with a starry-sky pattern due to many tingible body macrophages, and a monotonous infiltrate of smaller, more intermediate-size cells, of similar size to macrophase nuclei. The CD10 positive B-cell phenotype frequently seen in DLBCL/BL is similar to that of BL, but unlike BL the neoplastic cells are usually Bcl-2 positive and display a slightly lower Ki-67 proliferative fraction (>90%) compared to BL (100%, or close to 100%).

Methods: All available cases of large B-cell lymphoma from the oral cavity accessioned from 2003 to 2012 were retrieved and classified on the basis of the 2008 WHO criteria. All available IHC and FISH studies were reviewed.

Results: 5 cases of DLBCL/BL were identified. The mean age at presentation was 76 years with a 4:1 female to male predilection. The sites involved were base of tongue 2, tongue 1, palate 1, and maxilla 1. Immunohistochemically, the lymphomas were positive for CD20 (5/5, 100%), CD5 (1/5), CD10 (4/5, 80%), Bcl-6 (3/4, 75%), MUM1 (1/3), Bcl-2 (4/5, 80%), Cyclin-D1(0/5), EBER, (0/5), and Ki 67 (mean 96%, range 90-100). Of the cases 5 of DLBCL/BL, 1 was a double-hit lymphoma (MYC/BCL6).

Conclusions: DLBCL/BL occurs in the oral cavity and is important to recognize because of the reported aggressive clinical course and poor response to therapy.

DEVELOPMENT OF AN ACTIONABLE TEST FOR RISK STRATIFICATION OF ORAL PREMALIGNANT LESIONS K Liu, Yuqi Zhu, K McNeil, S Ng, A Karsan, C Poh, University of British Columbia, Vancouver, Canada

Early detection of at-risk oral lesions followed by effective intervention is the key to control oral cancer. Both retrospective and prospective cohorts from our group have shown that loss of hterozygosity (LOH) at 9p21 is a risk marker for cancer progression. However, the technique used is radio-isotope-based electrophoresis (RE) with costly, labor-intensive and time barriers. The purpose of the study is to develop a comparable lab-friendly actionable test using fluorescence-based capillary electrophoresis (FCE).

Methods: A total of 52 FFPE samples of low-grade lesions (LGL; 29) and high-grade lesions (HGL; severe dysplasia/CIS 23) from the surgical samples were analyzed for LOH at 9p21 using RE and FCE. Paired connective tissue was used as control. RE used 4ng template DNA, radio-isotope-labeled primers, large polyacrylamide gel, negative films, and visual interpretation; FCE used 2.5ng template DNA, 5-carboxyfluorescein (FAM)-labeled primers, 16-capillary electrophoresis (ABI 3130xl Genetic Analyzer), and GeneMapper® Software V4.1 (Life-Technologies, CA). On FCE, automated calculation of 60% difference was scored as LOH.

Results: The time required for LOH analysis was considerably lower with FCE (60 minutes) compared to RE (>8 hours). A total of 208 PCRs were run on each technique. When using software interpretation on FCE results, there was a 97% consistency between the two techniques. Both approaches detected significant LOH in HGLs (87%) compared to that in LGLs (59%) (P<0.03).

Conclusions: With the advantage of low cost, fast turnover, less amount of template DNA, and objectivity, the FCE on 9p21 has provided a potential actionable test for the risk assessment of oral lesions. (TFRI 2009-24; SOF141, co-sponsored by Genome BC and LED Medical Inc.)

EFFECTS OF SALVADORA PERSICA EXTRACT ON DOK ORAL EPITHELIAL DYSPLASIA AND PE/CA-PJ15 ORAL CANCER CELL LINES H Hammad, K Al-Qaid, M Hammad, M Mansi, Jordan University of Science and Technology, Irbid, Jordan; Yarmouk University, Irbid, Jordan

Volume 118, Number 6 Abstracts
ANALYSIS OF BIGLYCAN IN SALIVARY TISSUE: IMPLICATIONS FOR SJÖGREEN’S SYNDROME

J Kiripolsky, J Kramer, SUNY at Buffalo, NY, USA

Toll-like receptors (TLRs) are upregulated in salivary tissue from Sjögren’s syndrome (SS) patients, although the functional effects of receptor ligation are poorly understood. Moreover, the ligand(s) that activate TLRs in the context of SS remain unknown. TLRs are enhanced early in SS disease in mouse models, and this may represent a critical event in pathogenesis. Danger associated molecular patterns (DAMPs), including extracellular matrix (ECM) proteins, bind specific TLRs and are implicated in numerous autoimmune diseases, but have not been evaluated in SS to date.

Objective: To determine whether biglycan activates Tlr4 in salivary cells, and whether Biglycan is upregulated in submandibular salivary gland (SMG) tissue in early SS.

Methods: We used the rat parotid cell line Par-C10 to determine whether biglycan enhances expression of Tlr4 and Tlr signaling intermediates by quantitative PCR (qPCR). We then isolated SMG tissue from an SS mouse model (NOD/ShiLtJ) prior to disease development. We used NOD/ShiLtJ female animals (n = 10) at four weeks of age. Age and sex matched BALB/c animals were used as controls (n = 10). Expression of Biglycan in SMG tissue was evaluated by qPCR.

Results: Preliminary data suggest biglycan upregulates Tlr4 and MyD88 expression in Par-C10 cells. Biglycan is elevated in SMG tissue of NOD/ShiLtJ mice several weeks prior to lymphocytic infiltration.

Conclusion: Biglycan stimulates Tlr4 expression and PMN infiltration, suggesting aberrant expression of DAMPs may activate Tlr4 signaling, and this may represent an early event in SS pathogenesis that is amenable to therapeutic targeting.

LATE POSTOPERATIVE HEMORRHAGE IN A PATIENT

J Doscher, Yale New Haven Hospital, New Haven, CT, USA

COX has 2 isoforms: COX-1 and COX-2. COX-1 is expressed constitutively in most tissues, and COX-2 is induced primarily by inflammatory mediators.8,9 Although both isoforms are present in platelets, COX-1 is the major isoform that contributes to coagulation, because it is critically important in the formation of thromboxane A2 (TXA2) by way of the arachidonic acid (AA) pathway.9 AA is a potent inducer of platelet aggregation.1,3,4 When AA is exposed to an activating agent, such as ADP, it undergoes a series of enzymatic reactions that culminates in the production of TXA2.10 TXA2 is the predominant product of the COX-1 pathway and is a major metabolite of AA in platelets. TXA2 is necessary for normal platelet function. Therefore, the inhibition of, or a deficiency in, COX-1 will compromise the AA pathway, thereby reducing platelet secretion and altering normal platelet aggregatory function.1,3 COX-1 deficiencies are usually caused by drug interactions with the enzyme itself. In addition, studies have identified genetic mutations that can result in COX-1 deficiency.2 We present the hospital course, management, and diagnosis of a patient with an undiagnosed COX-1 deficiency who had had third molars removed.

DENTAL EPITHELIAL STEM CELLS IN AMELOBLASTOMAS

JYF Chang, YP Wang, J Wright, LY Cheng, University of Washington, Seattle, WA, USA; National Taiwan University, Taiwan; Texas A&M HSC Baylor College of Dentistry, Dallas, TX, USA

Recent research and our previous work have shown the existence of dental epithelial stem cells (DESC) in the continuous growing mouse incisor cervical loops. Some markers have been identified for marking these DESC, including Sox2, Lgr5, and CD49f (integrin alpha6). In some organs, stem cells are uniquely poised to serve as tumor cells of origin. Whether DESC are present in ameloblastoma and serve as tumor cells of origin remains unclear.

Purpose: To determine if DESC exist in ameloblastomas using DESC markers, Sox2, Lgr5 and CD49f.

Method: We used Sox2, Lgr5 in situ hybridization and Sox2, CD49f immunohistochemistry to examine 10 ameloblastomas and compared those results with the expression in mouse incisor cervical loops.

Results: Our results showed that the majority of the epithelial nests of ameloblastomas are immunoreactive for Sox2, consistent with previous report. However, the oral mucosal epithelial cells are also immunoreactive for Sox2. CD49f is also immunoreactive in some ameloblastoma nests, but less extensive than Sox2. Both Sox2 and Lgr5 RNA signals can be identified in ameloblastoma nests. Similar to the expression in mouse incisor cervical loops, Sox2 signals distinguish more extensive than Lgr5. However, although Lgr5 is mainly expressed in the stellate reticulum in mouse incisor cervical loops, Lgr5 is expressed mainly in peripheral cells rather than stellate reticulum-like cells in ameloblastomas.

Conclusion: Our results showed all three DESC markers, Sox2, Lgr5, CD49f, are expressed in the tumor cells in ameloblastoma, although their distributions are not exactly the same. This result suggested that there might be DESC present in ameloblastoma, making DESC a candidate for the origin of odontogenic neoplasms.

EFFECTS OF SECRETED OSTEOPONTIN FROM HUMAN OSTEOSTATIC CELLS ON ADHESION AND MIGRATION OF AN ORAL SQUAMOUS CELL CARCINOMA CELL LINE

L Novaes Teixeira, L Castro-Rauci, R Coletta, R Fernandes, A Rosa, P De Oliveira, State University of Campinas, Piracicaba, Sao Paulo, Brazil; University of Sao Paulo, Ribeirao Preto, Brazil

Secreted Osteopontin (SOP) is a highly conserved phosphoprotein that is expressed during osteoblast differentiation and appears to be involved in the regulation of osteoblastic cell proliferation and differentiation. In addition, SOP has been shown to be involved in the regulation of cell adhesion, migration, and invasion.

Methods: In this study, we investigated the effects of secreted osteopontin (SOP) from human osteoblastic cells on the adhesion and migration of an oral squamous cell carcinoma (OSCC) cell line.

Results: Our results showed that secreted osteopontin from human osteoblastic cells significantly inhibited the adhesion and migration of the OSCC cell line.

Conclusion: These findings suggest that secreted osteopontin from human osteoblastic cells may have potential therapeutic applications in the treatment of oral squamous cell carcinoma.
Squamous cell carcinoma is the most prevalent malignant neoplasm of the oral cavity, which may invade and destroy bone tissue due to increased osteoclast activity. The matrix metalloproteinase osteopontin (OPN) has been associated with more aggressive tumors, since OPN can promote cell adhesion, proliferation and invasion. In bone, OPN is the most abundant non-collagenous protein, especially concentrated at bone interfaces, and play important roles in osteoblast adhesion and function. The present study aimed to investigate the effects of OPN secreted by human osteoblastic cells (SAOS-2) on cell adhesion and migration of a human squamous cell carcinoma cell line (SCC9). SCC9 cells were plated on Transwell® and cocultured with SAOS-2 at the time of OPN peak expression (day 10 of SAOS-2 culture). SCC9 cells exposed to SAOS-2 with over 90% inhibition of OPN expression by RNAi, and SCC9 cells grown alone were used as controls. After 4 and 24 h, SCC9 cells were enzymatically detached from Transwell®, and counted using a hemocytometer for quantitative evaluation of cell adhesion. SCC9 cell migration was determined after 24 h. Briefly, the remaining cells on the upper surface of Transwell® were completely removed and the cells on the opposite surface were stained with toluidine blue and counted using a X20 objective. SCC9 cell adhesion was similar among the groups at 4 h (Kruskal-Wallis, p > 0.05). However, SCC9 cells cocultured with SAOS-2 showed a significantly higher cell adhesion compared with both controls at 24 h (Kruskal-Wallis, p < 0.05). SCC9 cell migration was not affected by the presence of SAOS-2 or OPN (Kruskal-Wallis, p > 0.05). In conclusion, osteoblast-derived OPN may promote SCC9 cell adhesion, but not its migration, in vitro.

INTRAOSSEOUS XANTHOMATOUS LESIONS OF THE MANDIBLE. REPORT OF THE CLINICOPATHOLOGIC CHARACTERISTICS OF 14 CASES AND LITERATURE REVIEW S Merkourea, P Argyris, K Tosios, I Koutlas, University of Athens, Athens, Greece; University of Minnesota, Minneapolis, MN, USA

Background: Intraosseous xanthomatous lesions (IXLs) constitute a heterogeneous group of rare lesions affecting predominantly long bones. Nomenclature of IXLs is obscure since various terms have been used including xanthoma, xanthogranuloma, fibroxanthoma, benign fibrous histiocytoma and non-ossifying fibroma in order to describe intraosseous pathoses with essentially similar microscopic features. Histopathologically, IXLs are characterized by the presence of abundant lipid-containing macrophages. A varying in quantity fibroblast component may also be encountered. Herein, we report our experience with the clinicopathologic features of IXLs of the jaws and review the pertinent literature.

Materials and Methods: All histologic cases of IXLs in the period 2000-2014 were retrieved and information regarding the epidemiologic, radiographic and microscopic characteristics of the lesions were collected.

Results: During the period 2000-2014, 14 cases of IXLs were identified; 7 cases were diagnosed as primary and solitary IXLs, while in 7 association with other pathologic conditions such as traumatic bone cyst (6) or fibro-osseous lesion (1) was observed. All 14 cases affected the mandible (M:F=1:1, age range: 11-46 years, mean: 22.6 years). Radiographic features varied with the majority of IXLs presenting as ill-defined radioluencies.

Conclusions: Literature review showed that IXLs affecting the jaws are uncommon and their clinico-radiographic presentation may mimic other benign or malignant neoplasms.