

## AAOMP Poster Abstracts

#2

### CONGENITAL GRANULAR CELL LESION IN THE VENTRAL TONGUE IN A 2 DAY-OLD NEWBORN

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A 2 day old newborn healthy girl from Cancun, Quintana Roo, with a polypoid mass in the ventral tongue near the Blandin Nun salivary glands, this is the first case in the family with this pathology. The mass is pedunculated, exophytic, smooth, soft and the same color of the mucosa, measuring 8 x 6 x 4 mm., and the clinical diagnosis was mucocele versus hamartomas or coristoma. The excisional biopsy was made under local anesthesia, not complications were present during the surgical removal. Microscopically stained with H&E the lesion was composed of large cell containing abundant granular cytoplasm and small hyperchromatic nuclei. The immunohistochemical was positive for vimetine, but negative for S-100 protein, alfa-smooth muscle actin an CD68. The diagnosis was CONGENITAL GRANULAR CELL LESION (Histological classification by the WHO) because the origin is the soft tissues and not in the alveolar regions, there are only 10 cases reported in the literature, the first was diagnosed in 1975 Dexter CT.

#4

### A CASE OF IN SITU CARCINOMA CUNICULATUM

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Oral Carcinoma Cuniculatum (CC) is a distinct entity with the potential for local aggressiveness. Although CC was included in the 2005 World Health Organization classification of head and neck tumors, its clinicopathologic features remain to be fully addressed. Clinical and histologic diagnosis can be challenging, as CC may mimic reactive or benign lesions, especially at its early stage. Herein, we present a case report of an in situ CC involving the crevicular epithelium of the gingival socket of the one maxillary molar and discuss its clinic-pathologic features, diagnosis, and management with emphasis on the challenges in reaching consensus diagnosis. To avoid misdiagnosis and delaying the timing to treat, acquiring adequate tissue sample and clinic-pathologic correlation are of utmost importance for the early diagnosis of CC.

#6

### ASSOCIATION OF CD24 GENE POLYMORPHISMS WITH ORAL LICHEN PLANUS

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The etiology of oral lichen planus is attributed to cell-mediated immune mechanisms and genetic factors. CD24 polymorphism had been associated with some autoimmune diseases, IBD and colon cancer. Objectives: To investigate the role and association of CD24 polymorphisms in OLP. Methods: Following diagnosis of OLP, genotyping of CD24 variants, C170T (rs8734), TG1527del (rs3838646), A1626G (rs1058881) and A1056G (rs1058818), was carried out by PCR-RFLP. Results: The study included 54 patients, 533 normal controls. Carriers of CD24 A1056G had a significant lower risk for OLP than WT individuals ( $p = 0.001$ ), a significantly lower risk for heterozygote and homozygote carriers compared to non-carriers ( $p = 0.008$ ;  $p = 0.002$ , respectively). Heterozygote and homozygote carriers of CD24 A1626G had a significant higher risk for OLP,  $p = 0.040$ ). No significant

differences could be demonstrated for prevalence of CD24 TGdel carriers. Conclusions:CD24 could play a role in the susceptibility to OLP. Some abnormal variants of CD24 (C170T and A1626G) are more frequent in OLP patients than in controls and seem to contribute to disease risk. A significant association between the CD24 A1056G and a lower OLP incidence was found, suggesting this variant may confer protection against OLP. Similar results were previously obtained in IBD, supporting the concept of shared genetic determinants of clinically distinct disorders.

#8

#### THE PROFILE OF HYPERPLASTIC CANDIDIASIS: A CLINICO-PATHOLOGICAL STUDY

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Objectives: To investigate systemic and local factors associated with the microscopic diagnosis of hyperplastic candidiasis. Methods: Retrospective analysis of hyperplastic candidiasis, 2000-2013. Results: The study included 62 patients, 40 M: 22 F, age 30-92 years, mean age 58.8. The most frequent locations were tongue (45.2%) and buccal mucosa (37.1%). Lesions were exophytic (43.5%), white (25.8%), ulcerated (11.3%) or red (6.4%). The most frequent associated systemic conditions were hypertension (40.3%), hyperlipidemia (25.8%), diabetes (19.3%), H&N malignancy (17.7%), other malignancy (14.5%), post-transplant and immunologic diseases (6, 9.7%). 8% of patients had received radiotherapy to H&N. A total of 208 medications were used in the group, 1-11 per patient, mean 3.7. Of these, 55.3% have recognized xerostomic potential, 8.2% were immunosuppressive, 3.8% chemotherapeutic agents, 7.7% inhalers. Smoking was reported in 19.3% of patients. Conclusions: Hyperplastic candidiasis has a male predominance and a predisposition for tongue and buccal mucosa. The most significant contributing factors were xerogenic drugs, malignancy of H&N or other malignancies, diabetes, use of inhalers, post-transplant and immunologic diseases as well as smoking.

#10

#### CHONDROID METAPLASIA IN A KERATOCYSTIC ODONTOGENIC TUMOR: A SOURCE OF DIAGNOSTIC CONFUSION

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Objective: This case is presented to alert oral pathologists to the potential for diagnostic confusion arising from the combination of limited material and the presence of chondroid in a biopsy of a keratocystic odontogenic tumor (KCOT). Case report: Clinical presentation: A fifty-eight year old woman presented with pain and swelling of two weeks duration in the left mandible. A Panoramic radiograph and CBCT revealed a 4 x 3 cm radiolucent lesion involving the left mandibular ramus. On biopsy, the surgeon noted cheesy debris suggesting a diagnosis of odontogenic keratocyst (OKC). The tissue submitted for microscopy, however, revealed islands of atypical, cellular chondroid with a sprinkling of giant cells and lymphocytes. Multiple, deeper sections did not reveal the cystic epithelium characteristic of KCOT. The lesion was interpreted as atypical cellular chondroid proliferation with a comment suggesting rebiopsy for a definitive diagnosis. Intervention: The lesion in the left mandible was excised in toto with peripheral osteotomy. The subsequent, definitive excision revealed a characteristic keratocystic odontogenic tumor, surprisingly lacking any residual areas of chondroid metaplasia. Conclusion: Chondroid metaplasia is rarely seen in the wall of the KCOT (OKC). Review of the literature documents only eight cases. In our unpublished, retrospective analysis of 250 cases, 3 showed chondroid metaplasia. A literature review did not reveal the diagnostic difficulty encountered above. It is well-known that any atypical cartilage in mandibular tissue will lead to a suspicion of malignancy. This case is presented to alert oral pathologists to this diagnostic pitfall.

## #12

### OSTEOSARCOMA OF THE MANDIBLE ARISING IN POLYOSTOTIC FIBROUS DYSPLASIA

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Background: Malignant transformation of fibrous dysplasia (FD) is very rare. The incidence of sarcomatous transformation is greater in polyostotic lesions, syndromic cases, or previously irradiated patients. Case Report: We present an unusual case of osteosarcoma arising in a previously unirradiated, non-syndromic, polyostotic FD. A 38 year-old woman presented to the oral and maxillofacial surgery department with facial pain on the left side, which worsened within several weeks. The patient was diagnosed with polyostotic FD approximately 10 years ago in the left mandible and left craniofacial bones. Radiographic examination revealed an interval increase in size of the lytic component of FD within the body and ramus of the left mandible with evidence of aggressive bone destruction and soft tissue invasion into the left masseter muscle. Malignant transformation of FD involving the body and ramus of the left mandible was suspected. Histologic examination revealed a hypercellular, spindle cell proliferation with variable foci of malignant osseous matrices. The cells exhibited moderate atypia, with numerous mitoses confirming the diagnoses of high-grade osteosarcoma. The patient underwent two cycles of neoadjuvant chemotherapy and segmental resection of left mandible with fibular free tissue flap reconstruction. The patient tolerated the treatment well, although she experienced a recurrent neck abscess as a complication. Conclusion: It is crucial to note that any changes in signs and symptoms of a long-standing disease. These should warrant radiographic and histopathologic evaluation. Sarcomatous transformation is a rare sequelae of FD, and its detection in early stages may aid in a disease free survival.

## #14

### A COMPARATIVE PILOT STUDY OF SYNDECAN-1 IMMUNOHISTOCHEMICAL EXPRESSION IN VERRUCOUS HYPERPLASIA, VERRUCOUS CARCINOMA, AND PAPILLARY SQUAMOUS CELL CARCINOMA OF THE ORAL CAVITY

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OBJECTIVE: Syndecan-1 (SDC1/CD138) is a heparan sulfate proteoglycan that participates in cell-matrix interactions also affecting multiple carcinogenesis-related processes, such as cell proliferation, apoptosis, angiogenesis, invasion and metastasis. SDC1 expression has been found to decrease in oral epithelial dysplasia and SCC, compared to normal oral mucosa. The aim of this study was to compare SDC1 immunohistochemical expression in verrucous hyperplasia (VH), verrucous carcinoma (VC), and papillary SCC (PSCC) of the oral cavity. METHODS: Immunohistochemical expression of SDC1 was analyzed in formalin-fixed paraffin-embedded tissue samples of 10 VH cases, 10 VC cases and 4 PSCC cases. The cellular localization and staining intensity of SDC1 immunohistochemical expression were evaluated both in the epithelium and the subjacent connective tissue. RESULTS: All VH cases showed membranous and limited cytoplasmic SDC1 expression of variable intensity (strong in 8 and moderate in 2 cases, respectively). A focal loss of SDC1 expression was noticed in 2 VH cases, both associated with the presence of sub-epithelial inflammation. All VC cases exhibited strong membranous SDC1 expression; however, in 7 out of 10 VC cases, focal areas of weak or absent membranous expression with concomitant strong cytoplasmic staining were observed. In PSCC, 3 out of 4 cases showed extensive lack of SDC1 expression. In cases with inflammation, regardless of the diagnosis, some mononuclear inflammatory cells showed intense membranous expression. Also, focal accumulation of SDC1 was seen in stromal connective tissue. CONCLUSION: There is a progressive loss of SDC1 membranous expression from VH to VC to PSCC, which is possibly associated with their different clinical behavior.

**#16**

**A HYPER IGE SYNDROME MOUSE MODEL**

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Objective: Dominant-negative mutations in signal transducer and activator of transcription 3 (STAT3) underlie the human primary immunodeficiency autosomal dominant hyper IgE syndrome (HIES). Deciphering STAT3's precise role in disease pathogenesis has been hampered by the lethality associated with germline deletion of Stat3 and the severe phenotypes associated with tissue-specific deletion. Methods: To clarify potential mechanisms, we generated bacterial artificial chromosome (BAC)-transgenic mice that expressed a HIES-associated Stat3 allele. The mutant allele was a deletion of valine 463 in the DNA-binding domain and was expressed at equivalent levels to that of wild-type Stat3 in our model. Results: Transgenic cells exhibited normal tyrosine phosphorylation of Stat3 following acute cytokine stimuli but marked inhibition in DNA-binding activity. These mice also had elevated serum IgE levels and showed a partial deficiency in IL-17 production. Conclusion: Collectively, the dominant-negative action of the mutant transgene, the elevated IgE levels and the IL-17 defect mirrored the HIES clinical phenotype, strongly supporting our system as a useful mouse model of this disease.

**#18**

**AN UNUSUAL MICROSCOPIC PATTERN OF FOREIGN BODY REACTION AS A COMPLICATION OF DRY SOCKET MANAGEMENT**

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**OBJECTIVE:** Foreign body reactions in the oral cavity are relatively common, frequently due to iatrogenic causes. Depending on the nature of the foreign material, various microscopic patterns may be observed causing diagnostic difficulties. Dry socket or alveolar osteitis is a common postoperative complication of tooth extraction. Medicated dressings of various compositions are commonly placed in the dry socket and may be a cause of foreign body reaction. **CLINICAL PRESENTATION:** A 56-year-old female presented complaining of a chronic infection in the area of the second left lower premolar, which had been extracted about one year ago. Panoramic radiograph revealed a well-defined radiolucent lesion resembling a non-healed post-extraction socket. A purulent darkly pigmented mass was surgically removed from the post-extraction area. **INTERVENTION AND OUTCOME:** Histopathologic examination revealed granulation and fibrous tissue containing multiple round to linear structures of brownish color; an intense mixed inflammatory infiltrate with numerous multinucleated giant cells was also seen. The initial microscopic differential diagnosis included parasitic infestation and unusual foreign body reaction of unknown origin. Upon careful questioning of the patient, it was revealed that, following extraction, alveolar osteitis had developed, managed with placement of Alvogyl (containing eugenol, iodoform, butamben and penqhwar fibers) in the socket every 4-5 days. The patient did not return for Alvogyl removal after the third application. **CONCLUSION:** Failure to remove medicament for dry socket management, such as Alvogyl, may result in a persistent foreign body reaction. Recognition of the ensuing unusual microscopic pattern necessitates careful clinicopathologic correlation.

## #20

### ATYPICAL METHOTREXATE-INDUCED ORAL ULCERS MIMICKING HISTOPATHOLOGICALLY A LYMPHOPROLIFERATIVE DISORDER: REPORT OF A RARE CASE

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Objective: Methotrexate (MTX) is an established antimetabolite and immunomodulating agent used in low doses (LDMTX) to treat several autoimmune diseases. Ulcerative stomatitis (US) may be observed as a long-term LDMTX adverse effect showing a wide histopathological spectrum that ranges from non-specific, to atypical, to EBV(+) mucocutaneous ulceration to lymphoproliferative disorders (LPDs). The aim of the present study is to report a rare case of MTX-induced US that mimicked histopathologically an LPD. Clinical Presentation: A 73-year old Caucasian female presented for evaluation of painful oral ulcers on the lower lip and the dorsal surface of the tongue of 5-day duration. She had been under treatment with LDMTX plus folate supplementation and systemic corticosteroids for rheumatoid arthritis for the last 15 years. Intervention and Outcome: Treatment with anti-virals and topical corticosteroids showed no response. Histopathological examination of a lingual ulcer revealed a polymorphous lymphohistiocytic proliferation with scattered binucleated atypical lymphocytes (Reed-Sternberg-like cells). Immunohistochemically, most cells were of T-cell lineage while monoclonality was absent and the EBER test was negative and a diagnosis of MTX-induced reactive ulceration was rendered. Superimposed fungal infection by *geotrichum candidum* was also found in lesional culture swabs. Cessation of MTX resulted in complete resolution of the ulcers 3 weeks later with no recurrences reported so far. Conclusion: The clinical and histopathological features of MTX-induced oral ulcers are not always diagnostic and an extensive history, clinical and laboratory investigation may be needed to exclude an LPD.

## #22

### METHOTREXATE-ASSOCIATED EBV-POSITIVE DIFFUSE LARGE B-CELL LYMPHOMA MIMICKING ARONJ - A DIAGNOSTIC PITFALL

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Introduction: Iatrogenic immunodeficiency-associated lymphoproliferative disorders are seen in patients treated with methotrexate. We report a unique case of methotrexate-associated EBV-positive diffuse large B-cell lymphoma (DLBCL) clinically presenting as osteonecrosis of the jaw. Case Findings: A 67-year-old female presented with mucosal ulceration and exposure of necrotic bone diffusely involving the left mandible. Computed tomography showed an ill-defined lytic process. The patients medical history was significant for osteoporosis treated with Fosamax (15 yrs) and dermatomyositis treated with methotrexate (10 yrs) and intermittent prednisone. She reported a 13-month history of increasing pain and recent paresthesia in the area despite antimicrobial therapy. With a working diagnosis of antiresorptive-related osteonecrosis of the jaw (ARONJ), she was referred for specialist evaluation. Sequestrectomy and debridement were performed, with submission of hard and soft tissues for histopathologic examination. A diffuse infiltrate of large mononuclear cells was seen in association with areas of soft tissue necrosis and nonvital bone. Immunohistochemical analysis revealed the large cells to be positive for CD30, PAX-5 and CD20, and in-situ hybridization studies showed reactivity for EBER. A diagnosis of methotrexate-associated EBV-positive DLBCL was rendered and the patient underwent 4 cycles of DA-REPOCH, followed by 2 cycles of RCHOP. At 16-months follow-up, the patient was asymptomatic with ongoing conservative management of her osteonecrosis. Conclusion: Histopathologic confirmation is critical to the diagnosis of atypical ARONJ presentations to exclude clinical mimics such as primary lymphoma of the jaw.

## #24

### CEMENTUM CHALICE: UNHEALING SOCKET FROM CUP-LIKE CEMENTUM FRAGMENT, WITH MULTIPLE PERIAPICAL RADIOLUCENCIES FROM CEMENTAL TEARS

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Objective: To present the 2nd patient ever reported with numerous cemental tears, including the first report of an embedded degloved apical cementum fragment. Clinical Presentation: A 60 y/o woman had apparent bone exposure in an unhealed, painful socket of #22, extracted 2 years earlier. She also had pain, erythema, cortical expansion & Class III mobility of #19, in addition to 4 asymptomatic mandibular periapical radiolucencies of viable teeth, and a 5x4 mm oval, tender, moth-eaten radiolucency of the #30 edentulous area. CT images showed considerable destruction of bone around #19, with moth-eaten borders and a thinned, perforated and expanded facial cortex, and slivers of apparent cementum. The unhealed socket #22 showed a 9x8 mm radiolucency with a thin, cup-shaped radiopaque structure embedded. The #30 area radiolucency contained a curved radiopaque sliver, as did 1 of the apical lesions. Intervention and Outcome: On biopsy, #19 area showed subacute osteomyelitis with bony sequestra, plus fragments of full-thickness cementum, consistent with cemental tear. The #22 area showed chronic fibrosing osteomyelitis with similar full-thickness cemental tears, the largest shaped like a cup or chalice. Biopsied sites were conservatively but thoroughly curetted. Six months after biopsy/curettage the areas were apparently healed, with good bone fill. Root scaling and bone curettage of the periapical radiolucencies and the #30 radiolucency were planned on the assumption that they also represented cemental tears. Conclusion: Cemental tear may present with many involved teeth, including multiple periapical radiolucencies and BRONJ-like unhealed sockets with embedded cementum fragments. This is the first cementum chalice report and the second report of multiple cemental tears.

## #26

### MANDIBULAR PATTERNS OF ISCHEMIC BONE DISEASE (IBD) - ASSESSMENT OF A HIGH RISK CADAVER COHORT

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Background: IBD has a well-established, uniquely varied histopathologic, imaging and anatomic appearance, including multi-site involvement. Much of this remains unknown for jaws, despite the fact that jaws are among the most commonly affected bones. Objective: To characterize IBD in mandibles from a cadaver cohort representing patients with extended systemic ischemic conditions and long terminal hospitalization. Methods: Well preserved mandibles were harvested from cadavers with death from: cancer, heart attack, stroke and autoimmune disease; all with long terminal hospital stays. Radiographs were taken and hemimandibles were sectioned sagittally from posterior to anterior, after formic acid decalcification, then examined grossly and compared with radiographs. Quantitative ultrasound was used on 12. For microscopic examination, representative samples of grossly normal medullary bone were removed from the third molar and premolar regions and from all grossly abnormal regions, then processed routinely for light microscopy. Results. 66 mandibles were processed, 62.2% from females. Average age at death: 69.0 years (range: 42-91). Overall, 40.9% had grossly abnormal bone, 89.7% with an anterior-posterior pattern. Average lesion size was 14x4 mm (range: 5x3 - 31x9 mm.) and 51.7% were multiple; all lesions were in molar & premolar regions. The primary appearance was a brown, very soft discoloration (79.3%), with ischemic cavitations in 13.6% & osteosclerosis in 6.9%. All abnormal areas showed IBD microscopically. Radiographs identified only 11.2% of lesions. Conclusion: IBD is seen in 41% of presumably ischemic mandibles, always in the molar/premolar region and usually with multiple lesions. Radiographs seldom helped localize lesions.

**#28**

#### CERVICAL CHONDROCUTANEOUS BRANCHIAL REMNANTS: A CASE REPORT

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Cervical chondrocutaneous branchial remnants (CCBR) are rare congenital anomalies of the head and neck (H&N) with microscopic features similar to other chondroid choristomas though with specific clinical presentation. Herein, we report a rare case of CCBR in a 1 year 9 month old girl. A 1 year 9 month old Jordanian girl presented with a unilateral, soft, exophytic subcutaneous mass (1.8 x 1.8x 0.5cm) in the lower third of the left side of the neck, anterior to the sternocleidomastoid (SCM) muscle. The lesion was painless, smooth and skin color; and was not associated with any discharge or with a fistulous tract. The child was otherwise healthy and well-developed. The mass was excised and submitted for histopathologic examination. Sections of the formalin-fixed, paraffin-embedded tissue revealed a polypoid mass surfaced by keratinized stratified squamous epithelium with associated adnexa overlying fibroadipose tissue with foci of mature hyaline cartilage. CCBRs are choristomas of the neck with specific clinical presentation, that separates them from other histomorphologically similar, or even identical, lesions of the H&N, such as accessory tragi. In 1997 Atlan et al. described a series of 17 patients with rare congenital anomalies, similar to accessory tragi histologically, although, rather than pre-auricular, they present in the lateral mid to lower neck. CCBR have male predominance. They present at birth and are usually located in the middle or lower third of the lateral neck, anterior to the SCM muscle. Of particular importance is the association of CCBR with more serious congenital anomalies. Therefore, although complete surgical excision is curative, a complete clinical investigation is recommended to rule out other associated, though more serious, anomalies.

**#30**

#### CLINICAL CHARACTERIZATION AND TREATMENT OUTCOME OF BURNING MOUTH SYNDROME PATIENTS IN A LARGE TERTIARY REFERRAL ORAL MEDICINE CLINIC.

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Burning mouth syndrome (BMS) is defined as persistent idiopathic pain of the oral mucosa without objective findings accounting for the symptoms. The literature in regards to treatment effectiveness is limited. The purpose of this study is to characterize the clinical and demographic features and treatment outcomes of patients with BMS at the UF College of Dentistry, Oral Medicine Clinic (UFCD). With IRB approval, the clinical record system at UFCD was retrospectively searched for BMS cases diagnosed between 2009-2014. Cases were excluded if the patient did not meet clinical criteria for BMS, if records were incomplete, or did not complete at least one course of treatment. Demographic and clinical data, medical history, and treatment modalities were recorded. Treatment effectiveness was recorded as the subjective improvement in symptoms as reported by the patient. A total of 64 BMS cases were included. Women made up the majority of patients (81.2%) and with an average age of 65 years. The most frequent systemic diseases were hypertension (59.4%), psychological disorders (51.6%), and gastroesophageal reflux (50%). Most of these patients were on 5 or more medications (70%). Clinical features were variable. Most frequent treatment regimens were as follows: alpha lipoic acid (n=57 of 122 total treatments, 46.7%) with improvement reported in 45.6%, clonazepam (n=21/122, 17.2%) with improvement in 33%, oral disintegrating clonazepam (n=19/122, 15.6%) with improvement in 52.6% and topical vitamin E (n=6/122, 4.9%) with improvement in 33%. The clinical presentation and treatment outcome of BMS was variable. In this study, some treatments showed modest improvement of symptoms, though smaller numbers of some therapies prescribed limited comparison of the treatment modalities.

**#32**

**CLINICAL PRESENTATION OF UNDIAGNOSED GERD IN OSA PATIENTS AND ITS IMPLICATIONS ON THE QUALITY OF LIFE**

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Studies have shown that there is a close association between obesity and obstructive sleep apnea (OSA). We report a case of a 47-year-old Caucasian male who presented with a chief complaint of “extensive erosion of the teeth.” Patient had a history of OSA and stated that he occasionally used CPAP. He denied any other medical conditions, besides weight issues (250 lb). It was very difficult for this patient to stay awake throughout the initial dental examination and he needed to walk around every few minutes in order to forcefully stay awake. Upon intra-oral examination, it was determined that the patient had a distinct, generalized pattern of dental erosion. His posterior teeth were more severely eroded than his anterior teeth, including the lingual and the facial aspects of these teeth. While the patient denied any medical conditions or heartburn or bulimia, it was determined that the underlying cause should be determined before a full mouth reconstruction could be undertaken. Based on a literature review of dental erosion, the patient was recommended to take an OTC proton pump inhibitor. Two weeks later, at his follow up appointment, the patient reported that he had been taking Prilosec and noticed that he was able to stay awake for 16 hours straight and then sleep through the night. Studies have reported that there is a correlation between OSA and GERD; however, the exact mechanism for this causal relationship is not known.

**#34**

**CLINICAL UTILITY OF MYB REARRANGEMENT DETECTION AND P63/P40 IMMUNOPHENOTYPING IN THE DIAGNOSIS OF ADENOID CYSTIC CARCINOMA OF MINOR SALIVARY GLANDS: A PILOT STUDY.**

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Background: The t(6;9)(q22-23;p23-24) MYB-NFIB fusion transcript is identified in 28-86% cases of adenoid cystic carcinoma (ACC). Also, there is recent evidence that ACC features a p63+/p40+ immunophenotype in >90% of cases, distinguishing it from p63+/p40- polymorphous low-grade adenocarcinoma (PLGA). Aim: To investigate 1) MYB rearrangement status and 2) p63/p40 immunophenotype of ACC, PLGA, and adenocarcinoma NOS (AdCa NOS) of minor salivary gland origin. Materials and methods: Six cases of ACC, 2 cases of PLGA, and 2 (high-grade) AdCa NOS were evaluated for the presence of MYB rearrangement using a MYB-6q23.3 break-apart FISH probe. All 10 cases were stained with antibodies against p63 and p40. Results: Four out of six ACCs were hybridized successfully and each featured MYB rearrangement. Both PLGAs and one of the AdCa NOS were negative. The second AdCa NOS showed MYB amplification in more than 60% of the neoplastic cells. By IHC, all ACCs and both AdCas NOS exhibited a consistent p63+/p40+ phenotype, while both PLGAs had a p63+/p40- or p63-/p40- profile. The possibility that the AdCa NOS which displayed MYB rearrangement represents an ACC with high-grade transformation cannot be excluded. Conclusions: Of the cases in this series, MYB rearrangements were identified in all successfully hybridized intraoral ACC but not in cases of PLGA or AdCa NOS, thus supporting the role of MYB in the pathogenesis of intraoral ACC. Additionally, the consistent p63+/p40+ phenotype can be used to differentiate ACC from PLGA.

**#36**

**INVESTIGATION OF THE PLAG1 REARRANGEMENT IN MINOR SALIVARY GLAND PLEOMORPHIC ADENOMAS, MYOEPITHELIOMAS, AND SELECTED CARCINOMAS WITH A MYOEPITHELIAL COMPONENT. A PILOT STUDY.**

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Background: Cytogenetic studies have revealed consistent PLAG1 rearrangements in 50-85% of pleomorphic adenomas (PA). PLAG1 abnormalities have also been reported in carcinoma ex-PA, salivary duct carcinoma and, rarely, in myoepitheliomas and myoepithelial carcinomas. Aim: To investigate PLAG1 rearrangement in benign and malignant minor salivary gland tumors with a prominent myoepithelial component. Materials and methods: Nine FFPE specimens of PA (4 with plasmacytoid predominance), 3 myoepitheliomas, as well as, 1 case each of myoepithelial ca, epithelial-myoepithelial ca and carcinoma ex-PA were evaluated for the presence of PLAG1 rearrangement using a PLAG1-8q12 break-apart FISH probe. Results: Among the 15 specimens 12 were successfully hybridized. Six out of nine PAs and one myoepithelioma revealed PLAG1 rearrangement. PLAG1 rearrangement in malignant cases was observed in the carcinoma ex-PA, while the epithelial-myoepithelial ca was negative for this aberration. Conclusions: We identified PLAG1 rearrangements in 67% of all successfully hybridized intraoral PAs but in only one of the three myoepitheliomas. PLAG1 can be a useful auxiliary tool for the distinction of carcinoma-ex-PA from other malignant SG tumors with a prominent myoepithelial component.

**#38**

**CLINICOPATHOLOGIC CORRELATIONS OF BRAF V600E MUTATION AND BRAF V600E IMMUNOHISTOCHEMISTRY IN AMELOBLASTOMAS**

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Objective: Recent research have shown frequent BRAF V600E mutation in ameloblastomas, especially in follicular type. Both sequencing and immunohistochemical staining of mutated BRAF have been used to identify and verify the BRAF V600E mutation status. However, the sensitivity and specificity of the BRAF V600E immunohistochemical staining is unclear. The aim of this study is to analyze the clinicopathologic correlations of the BRAF V600E mutation and BRAF V600E immunohistochemistry in ameloblastomas. Methods: We studied and compared the BRAF V600E mutation using sequencing and BRAF V600E immunohistochemistry in five ameloblastomas and using five dental follicular tissues and one thyroid papillary carcinoma as negative and positive controls, respectively. Results: Our results showed that four out of five (80%) ameloblastoma cases are positive for BRAF V600E mutation. Three follicular type and one mixed follicular and plexiform type of ameloblastomas are positive for BRAF V600E mutation by sequencing. One plexiform case is negative for BRAF V600E mutation. The BRAF V600E mutation was strongly associated with follicular type of ameloblastomas. BRAF V600E immunohistochemistry revealed the same results as sequencing and specifically stained in only tumor cells. The sensitivity of BRAF V600E immunohistochemistry for the BRAF V600E mutation was 100%. Conclusion: Our pilot study showed that positive BRAF V600E immunohistochemistry significantly correlated with the BRAF V600E mutation. Although more cases are required to consolidate the current results, this suggests BRAF V600E immunohistochemistry as a screening tool for BRAF V600E mutation in follicular ameloblastomas.

## #40

### DEMOGRAPHIC, CLINICAL, AND HISTOLOGIC FEATURES OF 78 CASES OF ORAL MUCOSAL MELANOCYTIC NEVI.

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Large case series characterizing oral mucosal melanocytic nevi (OMMN) in the literature are scarce. This study aims to define demographic, clinical, and histologic features of 78 cases of OMMN within a large biopsy service. With IRB approval, the archives of the UF College of Dentistry oral pathology biopsy service were queried from 1994-2014 for diagnoses of all forms of OMMN. Original slides were reviewed. Cases were excluded for the following: dermal lesions, insufficient material for review, repeat biopsies of the same lesion, and disagreement with original diagnosis. A total of 78 cases were included in the study and age, gender, race, location, clinical features and impression, and histologic diagnosis were recorded for analysis. OMMN were diagnosed more often in females (n=47, 60.3%) and Caucasians (n=40 of 62 known race, 64.5%) with an average age of 37.7 years (range 1-89). The most common locations were palate (n=37, 47.4%), gingiva (n=18, 23.1%), and buccal mucosa (n=11, 14.1%). Of the cases where clinical appearance was reported, lesions were predominately pigmented (n=55 of 73 reported, 75.3%) and appeared either as a macule or nodule in nearly equal numbers. Among 67 reported clinical impressions, most favored a melanocytic or a pigmented differential diagnosis including amalgam tattoo (n=43, 64.1%), followed by soft tissue or reactive lesion (n=18, 26.9%) or papillary lesion (n=6, 9.0%). Intramucosal nevus (n=45, 57.7%) was the most common histologic diagnosis, followed by blue nevus (n=21, 27.0%), compound nevus (n=7, 8.9%), junctional nevus (n=3, 3.8%), Spitz nevus (n=1, 1.3%), and combined nevus (n=1, 1.3%). Clinicians should be aware that OMMN may occur in a diverse racial population, a large age range, and demonstrate varied clinical appearances.

## #42

### DOES CANDIDAL CARRIAGE CORRELATE WITH THE DEVELOPMENT OF ORAL CANDIDIASIS?

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Objective: The purpose of this retrospective single-center cohort study was to determine a) the prevalence of candidal carriage in patients with oral mucosal disease scheduled for treatment with topical immunosuppressive therapy, and b) the incidence of oral candidiasis among carriers and non-carriers after initiation of therapy. Methods: The medical records of patients who underwent pan-oral swab cultures for Candida between January 2009 and December 2013 at the Division of Oral Medicine and Dentistry, Brigham and Women's Hospital were reviewed. The prevalence of candidal carriage and incidence of candidiasis were determined using descriptive statistics. Results: 101 patients were evaluated for the prevalence of candidal carriage. Of these, 20 (20%) were candida-positive and 81 (80%) were candida-negative. 55 of the 101 patients had follow-up data and were evaluated for the incidence of candidiasis after initiation of topical immunosuppressive therapy. Of these, 8 were candida-positive (15%) and 47 (85%) were candida-negative. There was no difference between the prevalence and incidence groups ( $p > 0.05$ ). Five of the 55 (9%) developed candidiasis. Four of 8 (50%) patients who were candida-positive developed candidiasis while only 1 of 47 (2%) who were candida-negative developed candidiasis. As such, candidal carriage is highly associated with the development of candidiasis ( $p < 0.00001$ ). Conversely, those without candidal carriage were unlikely to develop candidiasis. Conclusion: The prevalence of positive candidal carriage status was 15-20%. Candidal culture sensitivity and specificity for candidiasis was 0.80 and 0.92, respectively. The positive predictive value was 0.50. Prophylactic anti-fungal therapy should only be reserved for positive carriage status patients.

#44

**FACTORS ASSOCIATED WITH COLLAGEN METABOLISM IN THE LYMPH NODE PRE-METASTATIC NICHE IN ORAL CANCER**

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Objective: recently we showed that capsule thickness of lymph-nodes free of metastasis (LN0) from pathologically metastatic-free neck dissections (pN-) was similar to that of LN0 from pathologically metastatic neck dissections (pN+) and that this parameter was associated with survival in oral cancer patients (Vered et al., Clin Exp Metastasis 2014). Thus, it was suggested that capsule thickness could be part of pre-metastatic niche morphological modifications. We aimed to assess expression of factors associated with collagen metabolism in lymph node pre-metastatic niche in oral cancer patients. Materials: LN0pN- (N=43) and LN0pN+ (N=30) were immunohistochemically stained for fibronectin (FN), lysyl oxidase-1 (LOX1), pro-collagen type I N-terminal propeptide (PINP) and collagen I (Coll I). Staining was assessed as 0 (no or weak staining), 1 (strong staining in 25% cells/area of extracellular matrix), 2 (same as 1 but in up to 50%) and 3 (same as 2 but in > than 50% of cells/area). Assessment was performed in the lymph node capsule (CAP), sub-capsular sinus (SCS) and medullary sinus (MS). Results: CAP-LN0pN- showed FN of scores 2 and 3 in 75% of cases vs. 50% in LN0pN+ (p>0.05) and PINP of scores 2 and 3 in 20% of cases vs. 45% in LN0pN+ (p>0.05). CAP-LN0pN- showed LOX1 in 30% of cases vs. 65% in LN0pN+ (p=0.002). Coll 1 was found in both LN0pN- and LN0pN+. SCS-LN0pN- and MS-LN0pN- showed PINP scores of 2 & 3 in 12% vs. 40% in LN0pN+ (p=0.018 and p=0.017, respectively). Conclusion: Factors involved in collagen metabolism seem to be part of the lymph node pre-metastatic niche in oral cancer patients.

#46

**FOCAL EPIDERMOLYTIC HYPERKERATOSIS: A REPORT OF THREE CASES AND REVIEW OF LITERATURE**

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Epidermolytic Hyperkeratosis (EHK) is a histopathologic entity that is most commonly associated with ichthyosiform disorders such as congenital bullous ichthyosiform erythroderma, an autosomal dominant condition. However, focal or incidental cutaneous EHK is associated with melanocytic nevi, epidermal nevi, basal cell carcinomas and actinic keratoses. METHODS: The archives of the biopsy service of Harvard School of Dental Medicine were searched to identify cases. RESULTS: There were two females and one male, aged 45, 56 and 69. Clinically, these lesions were solitary and asymptomatic, and were described as leukoplakia, sloughing mucosa and edema each. Two cases were located on the attached gingiva and one on the hard palatal mucosa, all unassociated with other mucosal disease. All cases exhibited compact hyperkeratosis, acanthosis, peri-nuclear vacuolization of the granular layer and numerous irregularly shaped, coarse keratohyaline granules. There were six other cases in the literature that were described on oral mucosa adjacent to oral squamous cell carcinoma (SCC), white sponge nevus (1 patient with lip and buccal mucosa biopsy), SCC and basal cell carcinoma of the lip (2) and actinic keratosis on the lip (2). Including our cases, such focal oral EHK occurred at a median age of 60 years, with 66% of cases noted in males. Excluding the four lesions on the lip which is not strictly oral, 3 occurred on the gingiva, 1 on the hard palatal mucosa, and 1 each on the buccal mucosa and lip mucosa associated with white sponge nevus. CONCLUSION: Focal EHK occurs rarely in the oral cavity and may be more likely to affect the keratinized tissue unless there is pre-existing mucosal disease. On the lips, is often associated with dysplasia or carcinoma, similar to cutaneous EHK.

#48

#### GENE EXPRESSION PROFILE OF MUCOEPIDERMOID CARCINOMA OF THE SALIVARY GLAND

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Mucoepidermoid carcinoma (MEC) is the commonest malignancy of the salivary glands. The recent discovery of the recurrent reciprocal translocation t(11;19)(q21;p12-13), which provokes the CRTC1/MAML2 gene fusion, represents the only genetic alteration common to MEC described to date. Despite this translocation being originally associated to a favorable prognosis in low-grade MEC, further studies revealed its presence in cases of aggressive high-grade MEC, therefore limiting its use as a stand-alone prognostic marker. The limited number of MEC molecular studies in the literature describe heterogeneous gene expression profiles and, in general, conflicting and inconclusive results. Therefore, the aim of this study was to evaluate the gene expression profile of MEC, comparing normal glandular tissue with low-, intermediate and high-grade tumors. Thirty-two fresh frozen samples (five control, 15 low-grade, five intermediate and seven high-grade) were supplied by the AC Camargo Hospital Biobank, and were submitted to RNA extraction. Global gene expression profiles were evaluated using the Whole Human Genome 8x60K (Agilent) platform, following the Two-color microarray-based gene expression analysis (Agilent) protocol. The BRB-ArrayTools program was used for gene expression analysis. Preliminary evaluation indicates that the intermediate grade tumors represent the most homogeneous group. Additionally, specific genes were observed to be underexpressed, including CNTNAP3 and SLC16A1. In conclusion, preliminary gene expression analysis of MEC suggests a possible association between histologic grade and gene expression profile. Further molecular analyses, including translocation status, are needed in order to improve classification and prognosis of MEC.

#50

#### GLOMUS TUMOR: A REPORT OF TWO INTRAORAL CASES.

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Glomus tumors are uncommon soft tissue tumors that usually occur in the deep dermis of the upper and lower extremity. The most common location is the subungual region of the finger but rarely these tumors can occur at other sites such as the nasal cavity, trachea, stomach, colon and bone. We report two unusual cases of Glomus tumor that presented as soft issue swellings in the oral cavity. One lesion presented as a swelling on the lower lip in a 40 year old male. The other lesion presented as a submucosal nodule on the right dorsal tongue in a 60 year old male. The clinical, microscopic, immunohistochemical features of the lesion in both the cases are discussed along with the differential diagnosis based on the clinical and microscopic features.

#52

#### HEMATOLOGIC MALIGNANCIES OF THE ORAL CAVITY: A CLINICOPATHOLOGIC STUDY OF 129 CASES ACCORDING TO THE 2008 WHO CLASSIFICATION

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The oral cavity is an uncommon location for the initial presentation of extranodal lymphomas and other hematologic malignancies. With IRB approval, our study retrospectively searched for oral hematological malignancies from 2000-2014 submitted to the UF Oral Pathology Biopsy service, and 178 cases were initially identified. Original slides and associated immunohistochemical stains were reviewed and reclassified using the 2008 WHO Classification. All cases that could not be reclassified under these guidelines were excluded as were cases with insufficient material. As a result, a total of 129 cases were included in the study. To the best of our knowledge, this represents the largest series of oral cavity hematological malignancies classified according to the 2008 WHO Classification. The patients ranged in age from 10 to 95 years (mean: 70 years), and a male to female ratio of 1.08:1. Clinically, most lesions were present for multiple weeks, and the most common sites were the maxilla/mandible (26%), palate (17%), vestibule (14%), and gingiva (12%). Tumors involved multiple sites in 15% of cases. The tumors consisted of lymphomas (77%), plasma cell neoplasms (17%), and myeloid tumors/leukemia (6%). The most common types of lymphoma were diffuse large B-cell (DLBCL) (57%), follicular (FL) (19%), and marginal zone B-cell of mucosa-associated lymphoid tissue (MALT) (7%). Less common diagnoses included mantle cell lymphoma, chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL), Burkitt lymphoma, NK/T-cell lymphoma, and post-transplant lymphoproliferative disorders (PTLD). Overall, our findings indicate a wide variation in location and specific sub-types of hematologic malignancies of the oral cavity using the 2008 WHO Classification.

#54

#### HISTOPATHOLOGIC CHARACTERS OF TUMOR SPECIMENS FROM ORAL CANCER XENOGRFT IN NUDE MICE TREATED WITH BETA-PHENETHYL ISOTHIOCYANATE (PEITC)

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Our previous studies demonstrated that PEITC selectively killed oral cancer cell lines. Furthermore, subcutaneously administration of 5 and 10 mg/ml PEITC significantly retarded the growth of oral cancer xenograft in nude mice and prolonged animal survival. However, its pathologic mechanism was unclear. Objectives: To investigate the histopathologic characters of tumor specimens from the xenograft experiment. Methods: 22 necropsy tumor specimens were obtained from TU138 xenograft-bearing mice receiving PEITC subcutaneously at 5 mg/kg (N=7), 10 mg/kg (N=8) and control (N=7). The specimens were H&E-stained and immunohistochemical-stained for Ki-67 and TUNEL. H&E sections were evaluated for morphologic changes. Ki-67-positive cells were counted and classified into intense (S,G2,M phases) and mild staining (G1 phase). In addition, TUNEL-positive cells were counted and percent positive cells were analyzed. Results: Morphologic studies showed features of squamous cell carcinoma in all groups. In PEITC-treated groups, acute and chronic inflammatory cells and granulation tissue were also noted. Interestingly, one specimen in 5 mg/kg PEITC group showed only granulation tissue with absence of viable tumor cells. The Ki-67 labeling indices and percent TUNEL-positive cells of all groups were not significantly different. However, the intense:mild Ki-67 staining ratio of 10 mg/kg but not 5 mg/kg PEITC was lower than control group ( $p=0.0008$ , Kruskal-Wallis test). This suggests a decrease of cell numbers in dividing phase and increase of cell numbers in resting phase of cell cycle. Conclusion: The histopathologic characters of tumor specimens suggest that the effect of PEITC in slowing tumor growth in vivo likely result from a shift of cell cycle balance from dividing to resting phase.

#56

HUMAN PAPILLOMAVIRUS DETECTION IN HISTOLOGICAL SAMPLES OF MULTIFOCAL EPITHELIAL HYPERPLASIA: A NOVEL DEMOGRAPHIC PRESENTATION.

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**OBJECTIVE:** Multifocal epithelial hyperplasia (MEH) is a benign oral mucosal proliferation caused by HPV type 13 and 32. Uncommon among Caucasians, MEH is most often reported in indigenous American children or adolescents, or more recently, in HIV-infected adults. Oral lesions microscopically consistent with MEH occurring in HIV negative adults have been recently noted in our lab. As other benign HPV-associated oral lesions (e.g. squamous papilloma) show clinical and histological overlap with MEH, HPV typing of these MEH lesions may help determine if this a unique presentation. **METHODS:** MEH samples (N=22 from 17 patients) and squamous papilloma control samples (N=9 from 9 patients) were compared with PCR-based genotyping for HPV. **RESULTS:** HPV positivity was significantly different between MEH lesions (86.4%) and controls (11.1%) (p=0.0002). In MEH lesions, HPV32 (45.5%), HPV6 (36.4%) and HPV 40 (4.5%) were detected. MEH lesions mostly occurred as multiple lesions (50.0%) in HIV negative patients (81.3% of MEH patients) and predominated on the labial/buccal mucosa (59.1%). Significant differences between groups were observed for anatomical site (p<0.0001). HPV6 was not detected in known HIV positive patients, while 50% of the lesions with HPV32 occurred in HIV positive subjects. MEH lesions with HPV32 invariably occurred as multiple lesions. No statistically significant differences in clinical characteristics were observed across patient groups. **CONCLUSION:** Lesions with MEH histology associated with HPV 6 and 32 occur in HIV negative, middle-aged to older adults; this represents a novel demographic presentation. One case with HPV40 is also a new finding. Future research should include HPV32 in routine detection protocols as it may be overlooked.

#58

HYBRID ODONTOGENIC CARCINOMA ARISING FROM A HYBRID AMELOBLASTOMA AND KERATOCYST ODONTOGENIC TUMOR: A CASE REPORT AND REVIEW OF THE LITERATURE

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Two of the more common odontogenic tumors are the keratocystic odontogenic tumor (KOT) and the ameloblastoma and the possible malignant transformation of each of these entities has been well recognized. However, the simultaneous occurrence of these two tumors as a hybrid odontogenic carcinoma of the jaws has never been documented in the literature. This case report describes the unusual finding of a hybrid tumor showing features of both an ameloblastoma and a KOT with malignant changes, in the maxilla of a 62-year-old Asian male. The patient presented with swelling and pain of his left maxilla persisting for one week. Radiographic examination revealed a 2X2 cm poorly defined radiolucency involving the periapical region of teeth #s 9-11 and producing "spiking" root resorption of tooth #10. Microscopic examination of the biopsy specimen revealed a fragmented tumor, which in areas was composed of a cyst with features of KOT while in other areas there were proliferating odontogenic epithelial islands within a fibrous stroma consistent with a follicular ameloblastoma. Throughout much of the specimen, however, there was a carcinomatous proliferation characterized by sheets of pleomorphic cells containing numerous atypical mitotic figures, aberrant keratinization, and central areas of necrosis. Immunohistochemical studies were performed for CD56, SOX2, calretinin, and Ki-67 and the results are also discussed. The aim of this report is to document in detail the clinical, microscopic and immunohistochemical features of this extremely rare odontogenic lesion in order to increase its awareness for future detection and treatment.

#60

#### IGG4-RELATED DISEASE IN THE SALIVARY AND LACRIMAL GLANDS AND PARANASAL SINUSES

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Background: IgG4-related disease is a systemic fibroinflammatory condition of unknown etiology, which may manifest in the head and neck region with salivary, lacrimal and sinus involvement. The major histopathological criteria include a dense IgG4+ lymphoplasmacytic infiltrate, fibrosis and obliterative phlebitis. Two of the three findings are required for diagnosis but an exception exists for minor salivary and lacrimal glands, where only the lymphoplasmacytic infiltrate may be identified. Most patients have elevated serum IgG4 concentrations. Methods: A 60 year old woman presented for evaluation of bilaterally enlarged submandibular glands with sinusitis. Prior workup included imaging of the head and neck, excision of right lacrimal gland, and two fine needle aspirations of the submandibular glands. These studies excluded neoplasia. The lacrimal gland biopsy demonstrated a marked lymphoplasmacytic infiltrate. Her clinical presentation raised suspicion for IgG4-related disease. Serum IgG subclass concentrations were measured and the plasma cells in the lacrimal gland were evaluated for IgG4 with immunohistochemistry. Results: Serum IgG4 was 168 mg/dl (abnormal >135 mg/dl). The lacrimal gland biopsy revealed >50 IgG4 plasma cells per high-powered field, with an IgG4:IgG ratio >30%. Correlation of clinical features, imaging studies, elevated serum IgG4 concentration and histopathology confirmed the diagnosis of IgG4-related disease. Patient was referred to rheumatology. Treatment with prednisone resulted in marked symptomatic improvement. Conclusion: IgG4-related disease has protean clinical features and should be considered in the differential diagnosis of adult patients presenting with sinus, salivary and lacrimal gland symptoms.

#62

#### IMMUNOHISTOCHEMICAL EVALUATION OF STAT3 AND MAPK EXPRESSION AND ACTIVATION IN ORAL SCC

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Objective: Signal transducer and activator of transcription 3 (STAT3) and mitogen activated protein kinases (MAPKs), including ERK and JNK, have been implicated in oral squamous cell carcinoma (OSCC) development and progression. Our purpose was to evaluate the phosphorylated levels of STAT3 (both tyrosine and serine), ERK1/2 and c-Jun (JNK substrate) by immunohistochemistry in OSCC samples and to investigate their possible correlation with tumor degree of differentiation. Methods: Immunohistochemical staining for pSTAT3 (serine and tyrosine), pERK1/2 and p-cJun was performed in 60 OSCC tissue specimens, including well, moderately and poorly differentiated tumors (20 each). A semiquantitative scoring system was used, by calculating intensity, percentage and combined scores. A correlation with tumor degree of differentiation was assessed. Results: Immunohistochemical levels of both pSTAT3(tyr) and pERK1/2 showed statistically significant differences between well and poorly differentiated tumors with the latter showing the highest mean average for percentage, intensity and total scores ( $p < 0.05$ ). In addition, pERK1/2 percentage score was significantly higher in moderately differentiated tumors compared to well differentiated tumors ( $p = 0.036$ ). On the other hand, p-cJun only showed statistically significantly higher intensity levels in moderately compared to poorly differentiated tumors ( $p = 0.036$ ). pSTAT3 (ser) immunoreexpression did not appear to correlate with differentiation. Conclusion: Our results suggest that pERK1/2 and pSTAT3(tyr) overexpression could contribute to a less differentiated phenotype in OSCC, while p-cJun and pSTAT3(ser) do not appear to correlate with the degree of differentiation.

#64

INDUCTION OF TOLL-LIKE RECEPTOR 2 AND ADENOSINE RECEPTOR ACTIVITIES IN ORAL SQUAMOUS CARCINOMA CELLS

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Background: The microenvironment of oral squamous cell carcinoma (OSCC) is colonized by microorganisms and is inflamed, but the regulation of inflammation in OSCC is not understood. In immune system cells, toll-like receptors (TLR) bind microbial and endogenous products and regulate the balance in expression of receptors for adenosine (AR A2a, A2b and A3), together working to regulate certain aspects of inflammation. Inflammatory sites and cancers are enriched for extracellular ATP, enzymes that dephosphorylate ATP, and the resulting adenosine. Previously we showed that non-immune system OSCC cells also express functional TLR, and that TLR2 activation in OSCC cells consistently stimulated A2aAR expression, but A3AR mRNA was usually below detection. A2aAR protein was also readily detectable in OSCC cells in vivo, supporting its potential importance in OSCC pathogenesis. Approach/Results: In this study, we used TLR2 and AR agonists +/- A2aAR-specific antagonist to evaluate the effects of TLR2 and A2aAR activation on cell signaling pathways in OSCC lines and in control oral keratinocytes and monocytoid THP1 cells, followed by electrophoresis and Western blotting of the purified proteins. Both TLR2 and A2aAR agonists induced rapid, marked and prolonged phosphorylation of ERK1/2 in OSCC cells, a molecule important in cancer development and progression. Conclusion: Our data suggest that microbial sensors and regulators of inflammation have the potential to directly contribute to the activation and maintenance of malignant squamous cell phenotype regulated by ERK1/2 activity. Supported in part by the GRU Pilot Study Research Program grant.

#66

LINEAR NECROSIS OF FREE GINGIVA CAUSED BY BRAFF INHIBITORS IN PATIENTS WITH METASTATIC MELANOMA: REPORT OF TWO CASES WITH TREATMENT

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BRAFF inhibitors make part of the arsenal of cutting edge targeted treatment for metastatic melanoma. Objective: We present a case series of two female patients aged 40 and 43 respectively that were referred to the Oral Medicine Clinic of A. Syggros Hospital for Dermatologic and Venereal Diseases for painful lesions of the oral cavity while being on treatment with BRAFF inhibitors for metastatic melanoma. Methods: In both patients, clinical findings upon oral examination were identical. Specifically, these consisted of a white, linear necrotic area affecting the majority of free gingiva in both mandible and maxilla. Interdental papillae were found to be intact in both patients, while one was found to have only mild gingivitis. One patient was a smoker. Laboratory values did not show any significant abnormalities. Patients were put on a combination regimen of broad-spectrum antibiotics (cephalosporin in one case and amoxicillin with clavulanate on the second) with metronidazole and were referred to a periodontist for concurrent periodontal treatment of underlying gingivitis and periodontitis. Results: Lesions resolved completely and the patients were able to continue treatment with BRAFF inhibitors, although one patient was temporarily removed from treatment because of subsequent skin lesions. She was put back on BRAFF inhibitor treatment. On follow up, neither of the patients developed gingival lesions again. Conclusions: Although there is one case of gingival hyperplasia reported on a patient with BRAFF, to our knowledge, we are presenting a novel and clinically characteristic of a hitherto unknown BRAFF inhibitor side effect that affects the oral cavity along with treatment that led to its resolution.

**#68**

**MAXILLARY SIMPLE BONE CYST IN ASSOCIATION WITH CALCIFICATION OF THE VERTEBRAL ARTERY AND CERVICAL SPINE CALCIFIC DEPOSITS**

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The simple bone cyst is a benign bone cavity that may be empty or contain fluid, and has no epithelial lining. Synonyms include traumatic bone cyst, idiopathic bone cavity, and unicameral bone cyst. Radiographic features are not pathognomonic, and may suggest an odontogenic or non-odontogenic lesion of the jaw, thereby necessitating surgical exploration for definitive diagnosis. We report the case of a 58-year-old male with the incidental finding of a radiolucency of the left anterior maxilla on intra-oral radiographic examination. Endodontic testing revealed vital teeth in the involved sextant. The radiographic diagnosis for the lesion was non-odontogenic cyst or benign neoplasm. Cone beam computed tomography (CBCT) was recommended to define the limits of the lesion. A review of the CBCT images supported the original differential diagnosis. The patient was referred to the Oral and Maxillofacial Surgery department for further management. Additional CBCT findings included calcific deposits in the region of the dens of the second cervical vertebra suggestive of calcium pyrophosphate dihydrate disease. Left vertebral artery calcification was also noted. Cardiology and Orthopedic Surgery consultations returned recommendations for periodic evaluation of the findings. Surgical treatment of the maxillary lesion revealed an empty cavity devoid of epithelial lining, with a presumptive diagnosis of simple bone cyst. No tissue was submitted for microscopic examination. Three-month follow-up radiographic examination revealed evidence of reparative bone formation. It is imperative that the maxillary defect be monitored closely to ensure complete healing, since no tissue was examined microscopically, and because of the unusual maxillary presentation of the simple bone cyst.

**#70**

**MULTINODULAR EPITHELIOID OSTEOLASTOMA OF THE MANDIBLE**

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Multinodular epithelioid osteoblastoma is a rare variant of osteoblastoma characterized by numerous nodules of epithelioid osteoblasts surrounding bony trabeculae as well as clusters of epithelioid osteoblasts without osteoid formation. It commonly occurs in gnathic bones of the face and spine, and has a male predominance. To date, only 26 cases of multinodular epithelioid osteoblastoma have been reported in the literature. Here, we add an additional case to those previously reported. An 18-year-old male patient presents with a periapical radiolucency in the region of vital tooth #30. The surgeon's differential diagnosis for this radiolucent lesion was ameloblastoma versus cyst. An incisional biopsy of the lesion revealed well-vascularized fibrous connective tissue containing a multinodular tumor composed of collections of epithelioid cells with osteoblastic differentiation surrounding zones of hyalinization and bony trabeculae. Multinucleated giant cells and rare mitotic figures were noted. Additionally present within the tumor were clusters of epithelioid osteoblasts without bony trabeculae. Residual immature viable bone trabeculae were noted surrounding the tumor. A diagnosis of multinodular epithelioid osteoblastoma was rendered. In this paper, we present a rare case of multinodular osteoblastoma of the mandible and a review of the literature. We will highlight the unique histological features that help differentiate this tumor from tumors classified as conventional osteoblastoma, aggressive osteoblastoma, epithelioid osteoblastoma and most importantly, low-grade osteosarcoma.

**#72**

#### MYELOID SARCOMA AS THE PRESENTING SIGN OF RELAPSED ACUTE MYELOID LEUKEMIA

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Myeloid sarcoma (MS), also known as granulocytic sarcoma, is defined by the World Health Organization as a tumor mass composed of myeloblasts or immature myeloid cells occurring in an intraosseous or extramedullary site. Lesions may precede or occur synchronously with leukemia or other myeloproliferative disorders. In some cases, it may represent the initial manifestation of recurrent disease or a harbinger of blast crisis or leukemic transformation. The most frequent sites of occurrence are the skull, paranasal sinuses, sternum, and ribs. Extramedullary involvement is less common and oral localization is extremely rare. We report a 3-year-old female who presented with an erythematous gingival mass buccal to teeth S and T, causing displacement of the associated teeth and destruction of the underlying alveolar bone. Her medical history was significant for acute myeloid leukemia (AML), treated with a stem cell transplant one year prior with relapse three months later. The patient was deemed in remission at the time of presentation. Histopathologic examination of the gingival biopsy revealed a dense proliferation of atypical round cells that were positive for CD117 and negative for MPO, CD20, and CD43, consistent with a diagnosis of myeloid sarcoma. Further evaluation revealed myeloblasts in her marrow, confirming a second relapse of her AML. She succumbed to her disease three months later. Despite its rarity, MS is an important diagnostic consideration for intraoral masses, especially in the setting of systemic symptoms suggestive of an underlying hematologic disorder. Although long-term survival is rare, early recognition leading to timely management has been associated with the best outcomes in reported patients.

**#74**

#### NODULAR FASCIITIS INVOLVING THE HEAD AND NECK REGION WITH MOLECULAR CONFIRMATION

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Background: Nodular Fasciitis (NF) is a rapidly growing benign myofibroblastic proliferation that may mimic a spindle cell sarcoma. Although a history of trauma is often elicited, recently NF has been proven to be clonal with rearrangement of USP6 by FISH, and fusion of MYH9 with USP6 [t(17p13)(22q12,3-q13)]. Objective: This study reviews head and neck nodular fasciitis with molecular confirmation in a primarily pediatric population. Design: The surgical pathology archives at a pediatric hospital were searched for cases of NF involving the head and neck region. An adult consultation case of the maxillary gingiva was included. Reverse transcriptase-polymerase chain reaction for the MYH9-USP6 gene fusion was performed from paraffin-embedded tissue blocks with appropriate controls (beta-actin). SMA and vimentin were also obtained. Results: 14 pediatric cases (10 males, 4 females; mean age 6.4 yr) and 1 adult case (female, 53 yr) were included. The sites were: scalp (4), forehead (2), neck (2), upper lip (1), submentum (1) maxillary gingiva (1), skull bone (1), parotid gland (2), submandibular gland (1). The histopathologic features of these spindle cell tumors showed a loose, storiform pattern, areas of higher cellularity with mitotic activity and a "tissue culture appearance". Tumors immunoreacted with SMA and vimentin. RT-PCR performed with all 15 cases demonstrating MYH9-USP6 translocations. With follow-up ranging from 1.5 to 30 years, there were no recurrent tumors identified even with incomplete resection. Conclusions: In highly proliferative NF tumors, the diagnosis may be confirmed with identification of MYH9-USP6 translocation by RT-PCR or alternatively by detecting USP6 rearrangement by FISH. NF pathogenesis appears to be linked to the fusion of MYH9-USP6.

**#76**

**ODONTOAMELOBLASTOMA: REPORT OF A CASE AND REVIEW OF THE LITERATURE**

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**Objective:** Odontoameloblastoma (OA) is an exceedingly rare odontogenic tumor occurring in adolescent and young-adult patients with equal distribution in the maxilla and mandible. Clinical features may include expansion of bone, resorption of teeth and pain. Radiographically it appears as a mixed radiolucency-radiopacity often associated with an impacted tooth. Histopathologically the tumor is made up of both epithelial and mesenchymal components. The epithelial component consists of an ameloblastic proliferation in follicular and plexiform patterns, whereas the mesenchymal component resembles an odontoma. OA is locally aggressive and the prognosis is similar to conventional ameloblastoma. We report a case of OA occurring in the posterior mandible of a seventeen-year-old female and present the clinical, radiographic and histopathological features. **Clinical Presentation:** A seventeen-year-old female presented to oral and maxillofacial surgery with an asymmetric swelling of the right mandible. Radiographic studies revealed a mixed radiolucent-radiopaque mass associated with an impacted third molar causing cortical expansion. **Intervention and Outcome:** Marginal mandibulectomy was performed and the patient is free of disease at two months. **Conclusion:** The clinical, radiographic and histopathological features of an OA occurring in a seventeen-year-old female are presented and the literature is reviewed. Therapy and follow-up protocol are discussed.

**#78**

**REAPPRAISAL OF THE ECTOMESENCHYMAL CHONDROMYXOID TUMOR: A MOLECULAR ANALYSIS**

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**Objective:** Ectomesenchymal chondromyxoid tumor (ECT) is an uncommon, benign lesion of the tongue. ECT resembles soft tissue myoepithelioma (ME) both microscopically and immunohistochemically. Some have suggested that ECT and ME are a single entity. Rearrangements in the Ewing Sarcoma Break-Point Region 1 (EWSR1) and less commonly Fused In Sarcoma (FUS) genes were recently identified in ME. Identification of the EWSR1 or FUS gene rearrangements in ECT would support the theory that ECT represents ME. Three cases possessing the histological and clinical features of ECT were evaluated for genetic rearrangements of EWSR1 and FUS. Cases negative for EWSR1 and FUS were further evaluated for Pleomorphic Adenoma Gene 1 (PLAG1) and High Mobility Group AT-Hook 2 (HMGA2) gene rearrangements, which have been consistently identified in pleomorphic adenoma (PA). **Materials:** Approval was obtained from the Hofstra NS-LIJ School of Medicine IRB. A total of three cases from the NS-LIJ Pathology (2) and the NYUCD Pathology (1) archives were identified and retrieved. Formalin-fixed paraffin-embedded specimens were stained with hematoxylin and eosin and selective immunohistochemical panels, and evaluated using fluorescence in-situ hybridization (FISH) for EWSR1. Negative specimens were then consecutively tested for FUS, PLAG1 and HMGA2 by FISH. **Results:** Case 1 was positive for the EWSR1 rearrangement. Case 2 was negative for EWSR1 and FUS rearrangements, but positive for PLAG1 rearrangement. Case 3 was negative for EWSR1, FUS, PLAG1 and HMGA2 rearrangements. Case 1 was re-classified as ME, case 2 was reclassified as PA and case 3 is indeterminate. **Conclusion:** Molecular analysis results may warrant nomenclature reappraisal.

**#80**

**ODONTOGENIC MYXOMA WITH DIFFUSE CALCIFICATIONS: A RARE HISTOLOGICAL FEATURE AND A DIAGNOSTIC PITFALL**

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Objective: Odontogenic myxoma is a rare benign tumor of the jaws. It shows a locally invasive behavior and tendency for recurrence after surgical removal. We describe a rarely reported finding of odontogenic myxoma with calcification. Clinical Presentation: A 45-year-old female patient presented with a gingival swelling around a mobile mandibular left second molar. Radiographic investigation revealed a large multilocular radiolucent lesion of the posterior mandible. Clinically, no bone expansion was noticed, and aspiration was negative. Microscopic examination revealed an odontogenic myxoma with the unusual finding of numerous newly formed trabeculae of bone or cementum-like material present throughout the specimen; reminiscent of those seen in fibro-osseous lesions of the jaws. Intervention and outcome: A total excision with safety margins was performed with preservation and relocation of the inferior alveolar nerve. The patient is under regular follow up and the surgical defect is healing gradually, and has no symptoms of paresthesia. Conclusion: To our Knowledge, only 3 documented cases of odontogenic myxoma with calcifications have been reported in the literature. This histopathological finding is rare but should not lead to the misdiagnosis of a central odontogenic fibroma, cemento-ossifying fibroma or fibro-osseous lesion.

**#82**

**ORAL MANIFESTATIONS OF CROHN'S DISEASE IN PEDIATRIC PATIENTS**

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Crohns disease (CD) is an inflammatory bowel disease that can affect any area of the gastrointestinal (GI) tract including the oral cavity. Oral manifestations include mucosal tag-like lesions, cobblestone appearance of the mucosa and deep linear ulcers. Microscopically, oral lesions are described as non-caseating granulomas. However, in our experience, lesions typically contain ill defined clusters of multinucleated giant cells (MNGCs), epithelioid histiocytes and eosinophils. The prevalence of oral lesions ranges from 20% to 50% and may present prior to GI symptoms. The highest prevalence for oral lesions is seen in the pediatric age group. In younger patients symptoms of CD are frequently atypical. Therefore, early identification of the oral manifestations in this group is significant. We report 4 cases of children with oral manifestations of CD and describe in detail the microscopic and clinical appearance of these lesions. All 4 patients demonstrated hyperplastic mucosa as one of their findings. Two of the 4 patients received a diagnosis of CD as a result of their oral biopsies. Oral biopsies done for all patients exhibited clusters of epithelioid histiocytes, MNGCs and eosinophils. Oral lesions in pediatric CD may continue to manifest even when the GI symptoms seem well controlled. The presence of extra-intestinal manifestations (EIM) indicates a more severe clinical course and typically indicates active disease even in the absence of GI symptoms. The combination of intestinal and EIM in these patients is associated with compromised nutrition and delayed growth. Since oral lesions may precede GI symptoms in children, it is important that dentists be aware of the various presentations as early diagnosis will ensure optimal management and improved prognosis.

**#84**

#### ORAL SQUAMOUS CELL CARCINOMA IN PATIENTS UNDER THE AGE OF 25

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Squamous cell carcinoma (SCC) is the most common malignant tumor of the oral cavity. It has a predilection for men over the age of 50 and a proclivity for the lateral tongue and floor of mouth. The pathogenesis is often related to environmental factors such as alcohol and tobacco use. We report a series of 7 cases of SCC in young adults under the age of 25 diagnosed in the 2 year period from 2013 to 2014. During that 2 year period we saw a total of 260 cases of SCC. The 7 cases represent 2.7% of all SCC diagnosed in our laboratory. All 7 cases were seen in males with an age range of 16-25. The primary tumor sites included the dorsal tongue, lateral tongue, ventral tongue, and the buccal mucosa. One patient had a history of Keratitis-Ichthyosis-Deafness (KID) Syndrome. Clinically, the lesions were described as erythematous and ulcerated. Three were described as exophytic. Histologic examination of the 7 cases showed: 3 well-differentiated SCCs, 1 moderately differentiated SCC, and 3 poorly differentiated SCCs with sarcomatoid /spindle cell features. Immunohistochemical staining for AE1/AE3, CK5/6, and P63 were performed on the 3 poorly differentiated SCC to confirm the diagnosis. Since there is growing evidence to suggest an etiologic role for human papillomavirus (HPV) infection in the development of SCCs, p16 staining was performed on all 7 cases. Four of the 7 cases were positive. Diagnosis of SCC in a young patient is rare and can have significant clinical implications. Additionally, the pathogenesis of SCC may differ from tumors seen in older individuals. HPV infection and molecular changes are likely to play a role. This study highlights the trend towards a younger age of onset for intraoral SCC that has been noticed in the past decade.

**#86**

#### PERINEURAL INVASION IN MUCOEPIDERMOID CARCINOMA

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Objectives: To retrospectively study the prevalence of perineural invasion in cases of mucoepidermoid carcinoma (MEC). The study will determine if previously assessed perineural invasion by original pathology reports would be increased by re-review of the originally hematoxylin-eosin-stained (H&E) slides as well as review of slides reacted immunohistochemically with S100 to enhance visualization of nerves. The study will also assess whether perineural invasion or its absence in MEC is associated with clinical outcome. Methods: Thirty-one cases of major and minor salivary gland MEC were reviewed for perineural invasion and compared to the perineural invasion status of the original pathology report when available (12/31). All H&E-stained slides were reviewed as well as S100-reacted sections of each case's tissue blocks that contained tumor. Patient demographics and clinical outcome were collected from electronic medical records. Results: Perineural invasion was identified in 25% (3/12) of tumors in the original reports, 13% (4/31) of the authors' re-review of the same slides, and 29% (9/31) when cases were reacted with S100. A positive relationship was seen between the discovery of perineural invasion on H&E and a greater number of foci of perineural invasion. Perineural invasion and larger-diameter nerve involvement was significantly associated with death at 5-year follow-up. Conclusions: Immunohistochemical enhancement improves the accuracy and speed of perineural invasion determination. Perineural invasion is a significant factor in the survival outcome of cases of MEC. These findings support the continued inclusion of perineural invasion as a grading parameter in MEC.

#88

POLYMORPHOUS LOW GRADE ADENOCARCINOMA WITH HISTOLOGICAL FEATURES MIMICKING BASAL CELL  
ADENOCARCINOMA: A CASE REPORT

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Polymorphous low grade adenocarcinoma (PLGA) is a low-grade malignant tumor arising mainly in the minor salivary glands. The most frequent site is the palate, but it can also arise in the buccal mucosa, upper lip, retromolar region, and the base of the tongue. Microscopically, it has a polymorphous growth pattern, including four main histological architectures: solid, tubular, fascicular, and cribriform. In contradistinction, basal cell adenocarcinoma (BCAC) is a rare tumor that more commonly arises in the parotid gland. Only a few case reports document occurrence in minor salivary glands. Microscopically, it shows four growth patterns: solid, trabecular, tubular, and membranous. The peripheral cells of the tumor nests show a palisade-like arrangement. We report a case of a PLGA, solid variant, with histological features similar to BCAC, arising in the upper lip of a 55-year old female. She presented with a 1.0 x 0.8 cm submucosal swelling of more than 2 years duration that was slightly painful and was increasing in size. Histologically, the tumor was unencapsulated and showed a predominant solid growth pattern. A trabecular-tubular growth pattern was also seen at the tumor peripheries. There was striking perineural invasion. The tumor cells manifested two configurations: uniform cells with round-to-oval nuclei and columnar cells with a palisade-like arrangement. Minimal pleomorphism and scarce mitotic activity was noted. Based on the histological features, the tumor was initially diagnosed as BCAC. Additional immunohistochemical stains (S100, LEF1, p40, p63) were performed, which supported a diagnosis of PLGA. We hereby illustrate this case to help others avoid possible pitfalls of diagnosing BCAC based solely on histological features.

#90

PREVALENCE OF HUMAN PAPILOMAVIRUS16 IN TONGUE CANCER - A MEDICAL CENTER BASED PRELIMINARY SURVEY IN  
TAIWAN

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Oral cancer is the 4th most prevalent cancer in Taiwanese males, and the 15th in females, estimating 6000 new cases a year. Betel quids chewing and smoking are known risk factors with a male to female ratio of 15:1. About 80% of oral cancer in male occurs at lateral border of tongue and buccal mucosa, while half of the female cases occurred at lateral border of tongue. Lacking known risk factors in female cancer patients raised the suspicion of human papillomavirus(HPV) infection, due to the high prevalence of HPV in cervix. It was hypothesized that HPV 16 overexpression was more prevalent in female oral cancer patients. Materials and Methods: Thirty-eight paraffin-embedded blocks of tongue cancer were retrieved from Chung Shan Medical University Hospital Department of Pathology including 20 males and 18 females. Clinical data showed that all males were habitual betel quids chewers and smokers but none of the females had both risk factors. Sections were obtained from each tissue block and immunohistochemical staining was performed using HPV16 antibody. The staining was recorded as negative (-) and positive (+~+++). Results: The staining of the male cases showed 10/20 (50%) positive. A total of 18 cases of female were reviewed and showed 9/18 (50%) positive. There was no difference between HPV staining positivity and gender. Conclusion: While betel quids chewing and smoking were known risk factors, the prevalence of HPV16 protein overexpression was 50% (19/38) indicating that HPV infection may also play a role in oral carcinogenesis regardless of gender. However, not all tumor cells were stain positively for HPV16 in those positive cases suggesting that HPV may not play an initiative role in carcinogenesis. Further study is needed for confirmation.

**#92**

**SALIVARY DUCT CYST OF MINOR SALIVARY GLANDS: 192 CASES AND RELATIONSHIP TO PAPILLARY CYSTADENOMA AND ORAL WARTHIN TUMOR**

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**OBJECTIVE:** The salivary duct cyst (SDC) is a reactive ductal ectasia frequently seen in minor salivary glands, likely caused by obstruction. The aim of this study is to define the clinical and histopathologic features of minor salivary gland SDCs and compare it to papillary cystadenoma and oral Warthin tumor (WT). **METHODS:** Cases were retrieved from the archives of Harvard School of Dental Medicine from January 2012-August 2014. **RESULTS:** There were 192 cases of which 110 (57.3%) occurred in females. The median age was 56 (range 2-95). Sites commonly involved were floor of mouth (20.8%), buccal mucosa (17.2%), and lower lip mucosa (15.6%). Eighty percent of cysts were lined, at least focally, by 1-2 layers of cuboidal/columnar epithelium. Varying degrees of oncocytic (49.5%), squamous (30.0%) and mucous cell (37.5%) metaplasia were noted. The lining had an undulating morphology in 39.1% of cysts. Chronic obstructive sialadenitis was seen in 91.1% of cases and a sialolith was present in 23 cases (12.0%). No cysts showed encapsulation or adenomatous proliferation of ducts, and true papillary structures with fibrovascular cores were not seen. Fourteen cysts (7.3%) were “WT-like”, characterized by oncocytic metaplasia, undulating cyst lining, and lymphoplasmacytic infiltrate, often with similar changes identified within adjacent glands. **CONCLUSION:** Minor salivary gland SDCs occur commonly in the floor of mouth and buccal and lower lip mucosa. Oncocytic metaplasia with an undulating cyst lining is not unusual and should not be mistaken for oncocytic papillary cystadenoma. Likewise, oncocytic SDCs with prominent lymphoplasmacytic inflammation should not be diagnosed as WT, which has well-formed papillae with fibrovascular cores and lymphoid stroma.

**#94**

**SALIVARY EXOSOMES FROM ORAL CANCER PATIENTS DIFFER IN SIZE BUT NOT IN THEIR NUMBERS FROM THOSE OF HEALTHY INDIVIDUALS**

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**Objectives:** Exosomes are abundantly present in body fluids, including saliva. They play a key role in remodeling of the tumor microenvironment and preparing the pre-metastatic niche. We analyzed the number and size of salivary nanoparticles in whole saliva of oral cancer (OC) patients and healthy individuals (HI). Next we isolated exosomes from saliva of both groups and determined if they differ in numbers and morphology. **Materials and Methods:** Whole pooled saliva from OC patients (n=28) and HI (n=10) was initially assessed by nanoparticle tracking analysis (NTA). Following ultracentrifugation (UC) or ExoQuick-TC" (EQ, Systems Biosciences, CA, USA) precipitation, exosomal pellets from OC patients and HI were morphologically examined by atomic force microscopy (AFM) and transmission electron microscopy (TEM). Western blotting (WB) was used to confirm expression of exosomal markers. **Results:** NTA showed a significantly higher modal nanoparticle size in OC compared to HI (97.9±39.2 nm and 42±26.7 nm, respectively; p=0.0004) but no significant differences were observed in the average number of nanoparticles. The morphological differences between OC- and HI-exosomes were highlighted when pellets isolated by UC or EQ were submitted to 3-dimensional AFM analysis. TEM provided evidence on the vesicular structure of the exosomes and WB analysis confirmed expression of exosomal markers in pellets isolated by both methods. **Conclusions:** Exosomes isolated from saliva of OC patients differed in size but not in their numbers from exosomes presented in normal saliva, probably reflecting modifications related to their role in intercellular interactions throughout the cancerous process.

**#96**

**THE EVOLVING ANOMALY OF MULTIPLE CALCIFYING HYPERPLASTIC DENTAL FOLLICLES**

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Multiple Calcifying Hyperplastic Dental Follicles (MCHDF) is a rare but documented entity with few cases reported in the literature. First described by Sandler et.al in 1988 as, “multiple dental follicles with odontogenic fibroma-like changes (WHO type)”, this was good descriptor of what was seen clinically and histologically. The current terminology, MCHDF, was coined by Gardner and Radden in 1995, bringing the total number of cases to 4. Over time similar cases have been published. Due to the rarity of the anomaly, no major reviews have been documented, nor has the entity prompted further investigation. Our aim is to add an additional documented case. A 15 YOM, presented with a complex medical history to include; mixed developmental disorder, autistic disorder, and unspecified quadriplegia. Clinical-radiographic exam revealed multiple impacted teeth, as well as supernumerary teeth. 4 well defined RL without significant expansion were found in all 4 posterior quadrants of the jaws. All of the RL were pericoronal and associated with more than 1 unerupted tooth. Operatively the surgeon encountered no cystic component but instead a solid mass of soft tissue. Histologically the biopsy showed dense fibrous connective tissue with abundant odontogenic rests, similar to the WHO odontogenic fibroma. Only occasional calcifications were noted. Based on the radiographic and histologic features we believe our case falls within the spectrum of MCHDF. However, CBCT demonstrated no calcifications within any of the 4 lesions and only focal calcifications were observed histologically. We believe that Odontogenic Follicular Dysplasia is a more descriptive name for this evolving anomaly.

**#98**

**UNUSUAL RADIOGRAPHIC PRESENTATION OF AN OSTEOSARCOMA IN AN 8 YEAR OLD MALE**

T. Gibson, U of Missouri, Kansas City, J. Whitt, U of Missouri, Kansas City B. Barker, U of Missouri, Kansas City N. Prater, U of Missouri, Kansas City Gnathic osteosarcomas are relatively rare; they account for 0.2% of all malignancies and 6-8% of osteosarcomas at all sites. Osteosarcomas have an equal frequency of distribution in the maxilla and mandible, although some sources report a slightly higher occurrence in the mandible. There is also a slight male predominance. The average age at the time of diagnosis for gnathic osteosarcomas is 33 years old, which is 10-15 years older than the mean age of diagnosis of osteosarcomas of the long bones. The radiographic presentation of a gnathic osteosarcoma can range from an ill-defined radiolucency to an ill-defined densely sclerotic lesion. Localized widening of the periodontal ligament and the classic sunburst appearance may also be observed. Commonly presenting clinical signs and symptoms includes pain, swelling and paresthesia. We are presenting a case of an 8 year old male with an asymptomatic well defined homogenous radiopaque lesion of the left maxilla. The lesion was observed on routine panoramic radiograph and the patient was lost to follow up. Five (5) years later, the patient presented with an asymptomatic mixed density lesion that had nearly doubled in size. The trephine biopsy specimen revealed decalcified sections of dense bone with fibrovascular marrow exhibiting extensive remodeling of thick, dense trabeculae as well as areas of “lattice like” bone. These dense bony trabeculae were highly cellular with enlarged atypical osteocyte nuclei arranged in a disorganized pattern. There was osteoid being deposited in the marrow space and permeating the adjacent host trabecular bone and periosteum. A diagnosis of low grade sclerosing osteosarcoma was rendered. The patient was treated with a partial maxillectomy and currently has an obturator.

**VERRUCOUS CARCINOMA ARISING IN AN ODONTOGENIC CYST**

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Background: Verrucous carcinoma (VC) is a variant of squamous cell carcinoma and presents as an exophytic lesion in the oral soft tissues. Cases of intrabony VC arising in an odontogenic cyst and of odontogenic cyst with verrucous proliferation have both been reported. Distinction between verrucous proliferation and VC in oral soft tissues and in similar intrabony lesions represents a diagnostic dilemma for pathologists. Case Report: An asymptomatic, 50-year old female with an unremarkable medical history was identified with a well-defined apical radiolucency in the right maxillary canine and first premolar area. The lesion was enucleated with curettage of the surrounding bone. Microscopic evaluation of fragmented specimen revealed a cystic epithelial process consistent with an orthokeratinized odontogenic cyst, with focal areas exhibiting a papillary configuration. Progressive radiographic changes two months later led to a second enucleation. Microscopic evaluation again revealed a cystic epithelial process displaying papillary projections. Concern for carcinoma cuniculatum was raised. Five months after initial presentation, segmental tooth mobility and progressive radiographic changes led to partial maxillectomy. A diagnosis of VC arising a cyst was rendered. Conclusion: This case exhibited the characteristic histologic features that define VC, specifically broad bulbous acanthotic rete ridges, parakeratin plugging and a papillary surface. The cellular morphology was bland, lacking atypia, pleomorphism and mitotic activity. Histologic overlap between VC and verrucous proliferation, especially arising in an intrabony process is recognized. However, the recurrent and aggressive nature of this lesion warranted the diagnosis of VC.