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## SURVIVAL TRENDS IN PATIENTS WITH METASTATIC MALIGNANT MESOTHELIOMA IN THE UNITED STATES – A POPULATION-BASED STUDY

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*Background:* This study was conducted to evaluate survival trends of patients with metastatic malignant mesothelioma during 1992 to 2003. *Methods:* We selected adult patients (≥18 years) with metastatic malignant mesothelioma from the Surveillance, Epidemiology and End Results (SEER) 18 database. We excluded cases with diagnosed death certificates and autopsycases. Patients without follow up were also excluded. We calculated 1- and 5-year relative survival rates for the patients during different time periods -1992-2003, 1992-1997, 1998-2003. We also analyzed survival rates by age (18-64, 65-85+ years), marital status (married, single*), sex (Male, Female) and race (white, black, American Indian/Alaska**, Asian/Pacific Islander). We used SEER Stat software to calculate 1-and 5-year relative survival rates (RS) with accompanying standard errors. *Results:* The database comprised of 2,582 patients (922 in 1992-1997and 1660 in 1998-2003). The relative survival between 1992-2003 for 1 year and 5 years was 36.5±1.0% and 5.5 ±0.5%, respectively. There was no significant difference in survival rates of the patients at 1 year (34.9±1.6 *vs*. 37.5±1.7, Z=0.677) and 5 years (4.0±0.7 *vs*. 6.4±0.7, Z=1.736) between 1998-2003 and 1992-1997. On sub-group analysis, there was a significant improvement in the survival rates for younger patients (18-64 years) diagnosed during 1998-2003 compared to 1992-1997 (1 year: 52.2±2.3 *vs*. 43.8±3, Z=2.189; 5 years: 12±1.5 *vs*. 7.4±1.6, Z=2.853). There was no significant improvement in relative survival rate in other cohort groups. *Conclusion:* The 1- and 5-year relative survival rates in young adult patients (18-64 years) with metastatic mesothelioma have significantly improved in 1998-2003 in comparison to 1992-1997.

*Never married, separated, divorced and widowed.
**The cohort 'American Indian/Alaska native' was incomparable due to inadequate data.

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## SECOND PRIMARY MALIGNANCIES IN MANTLE CELL LYMPHOMA: A U.S. POPULATION-BASED STUDY

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*Background:* The risk of second primary malignancy (SPM), which is a serious long-term complication in cancer survivors, is not known for Mantle cell lymphoma. In this population-based study, we analyzed rates of SPM in an adult population with Mantle Cell Lymphoma (MCL). *Methods:* We selected adult (≥18 years) patients with MCL as first primary malignancy diagnosed within January 1992 to December 2011 from National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) 13 database. We calculated the risk of second primary malignancies of MCL using multiple standardized incidence ratio (MP-SIR) session of SEER* stat software. *Results:* Among 3,149 patients, 261 (8.29%) developed 287 second primary malignancies with an observed/ expected (O/E) ratio of 1.32 (95% confidence interval=1.17-1.48, $p<0.001$), and absolute excess risk (AER) of 54.32 per 10,000 population. The median time to SPM from the time of diagnosis was 47 months (range=6 months-17.91 years). The median age for SPM was 71.5 years (range=37.67 years-100.33 years) and median follow-up duration was 31 months (range=6 months- 16.25 years). The significant excess risks were observed for skin excluding basal and squamous cancer (N=22, O/E=2.24, CI=1.4-3.39, $p<0.001$), thyroid malignancy (N=6, O/E=3, CI=1.1-6.52, $p<0.01$), acute myeloid leukemia (N=15, O/E=7.74, CI=4.54-13.94, $p<0.001$), chronic lymphocytic leukemia (N=20, O/E=7.27, CI=4.44-11.23, $p<0.001$), and Non-Hodgkins' lymphoma (N=35, O/E=3.79, CI=2.64-5.27, $p<0.001$). The risk of cancer development in the brain, thyroid, rectum and anal canal was higher during the first two years following diagnosis of MCL, while skin cancer-excluding basal and squamous cancer- incidence was higher after two years of latency. *Conclusion:* There is a significantly higher risk of second primary malignancies in patients with MCL compared to the general population. Early diagnosis, effective treatment and regular follow-up will improve survival in patients with mantle cell lymphoma.

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## SECOND PRIMARY MALIGNANCIES IN BURKITT'S LYMPHOMA

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*Background:* Second primary malignancy in Non Hodgkin's lymphoma is a well-known complication in treated cases. There is no data on second primary malignancies in Burkitt's lymphoma. This study was conducted to evaluate second primary malignancies in patients with Burkitt's lymphoma. *Methods:* We selected adult patients diagnosed with Burkitt's lymphoma from National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) 13 database. We calculated the risk of second primary malignancies in anal

cancer patients using multiple primary standardized incidence ratio (MP-SIR) session of SEER* stat software. *Results:* A total of 1,757 patients with a diagnosis of primary Burkitt's lymphoma were reported in the SEER 13 registry during January 1992 to December 2011. The median age at diagnosis of Burkitt's lymphoma was 59 years (13-95 years) and median follow up duration of patients was 16 months (0-147 months). A total of 80 patients (4.55%) developed 86 second primary malignancies, with an observed/expected (O/E) ratio of 2.02 (95% confidence interval=1.62-2.5, $p<0.05$), and an absolute excess risk of 45.82 per 10,000 populations. Malignancies of colorectum (O/E=2.32, $p=0.03$), larynx (O/E=8.09, $p=0.01$), thyroid (O/E=5.27, $p=0.02$), Kaposi sarcoma (O/E=61.77, $p<0.05$) and hematological tumors like non- Hodgkin's lymphoma (O/E=5.11, $p<0.05$), acute myeloid leukemia (O/E=22.59, p value=<0.05), non-lymphocytic leukemia (O/E=16.69, $p<0.05$) were the main second primary malignancies in Burkitt's lymphoma patients. *Conclusion:* The risk of second primary malignancies in adult patients with Burkitt's lymphoma is significantly increased compared to the general population.

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## MYELOMATOUS PLEURAL EFFUSION PRESENTING WITH EXTREME HYPERFERRITINEMIA AND SEVERE INFLAMMATORY RESPONSE: A CASE REPORT

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*Background:* Pleural effusions occur in 6% of Multiple Myeloma (MM) patients but primary myelomatous pleural effusion (MPE) accounts for less than 1% of these and only about 80 cases have been reported. MPE is a sign of advanced disease with a median survival of less than 4 months. Diagnosis is based on atypical plasmacytes in effusion cytology or pleural fluid immunoelectrophoresis. *Methods:* We analyzed an MPE case and conducted a review of the available literature in the English language. *Results:* A 40-year-old male was admitted for acute respiratory failure and fever. His history included Stage III IgA Lambda MM which responded to a modified regimen with bortezomid, bendamustine and dexamethasone. Pulmonary embolism and heart failure were ruled-out. Chest imaging showed bilateral ground-glass opacity with superimposed septal thickening and he received broad spectrum antibiotics but blood and bronchial cultures were negative. After 3 days, he developed multi-systemic organ failure and right pleural effusion. His serum ferritin level was 1,1598.5 ng/ml, but bone marrow biopsy showed no evidence of hemophagocytic lymphohistiocytosis (HLH). Thoracentesis revealed a culture-negative exudate with atypical plasma cell proliferation. He perished despite high-dose steroids and fluid drainage. *Conclusion:* Ferritin is used as a marker in MM and some studies show its value as a mortality predictor by correlating with disease activity and tumor load. Given the meticulous ruling-out of alternative etiologies, our case links MPE with extreme levels of hyperferritinemia, a characteristic of severe inflammatory states such as HLH and septic shock, where ferritin is thought to have a pathogenic role, leading to a cytokine storm and catastrophic clinical outcomes, known as the hyperferritinemic syndrome. Although ferritin and inflammatory markers have not been reported in previous MPE cases and confirmation is needed with further studies, this relationship can explain the poor clinical prognosis of this infrequent entity.

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## CASE PRESENTATION: AN UNUSUAL CAUSE OF PANCYTOPENIA IN A HIV PATIENT

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A 46-year-old African American female with recently diagnosed HIV presented with unquantified weight loss, subjective fevers, generalized weakness and worsening shortness of breath. She was previously diagnosed with a pulmonary embolism and was started on warfarin 5 mg PO daily. Her laboratory results revealed WBC 800/uL, hemoglobin 9.8g/dL and platelet count 32,000/uL. Absolute neutrophil count was 540/uL and INR was 1.9. HIV viral load was undetectable with CD4 count of 159/uL. A bone marrow aspiration and biopsy was performed. This showed a hypercellular marrow (nearly 100%) completely effaced by fibrosis and inflammatory infiltrate with large neoplastic lymphoid cells compatible with classical Hodgkins' lymphoma (HL). Staging studies using CT scan showed no evidence of nodal or extra-nodal disease detected. She was started on ABVD (adriamycin, bleomycin, vinblastine, dacarbazine) but after the first cycle she developed cough and shortness of breath so bleomycin was withheld for cycles 2 and 3. Follow-up PFT's (Pulmonary Function Testings) were normal and ABVD resumed for cycles 4 to 6. A bone marrow aspirate and biopsy performed after cycle 2 showed a hypercellular marrow with tri-lineage hematopoiesis and no evidence of HL. A PET/CT scan performed after cycle 3 and another after 6 cycles showed no evidence of systemic disease and only 1 reactive left iliac lymph node was observed, which was proven to be inflammatory. During her last assessment 26 months after her chemotherapy, she remained asymptomatic and without evidence of systemic disease. HIV-associated HL is usually

widespread at presentation and has an aggressive natural history. Isolated primary bone marrow Hodgkin lymphoma (PBMHL) is a rare entity described in case reports exclusively affecting males with B symptoms. To our knowledge this is the first reported case of a female patient with PBMHL successfully treated with ABVD. PBMHL should be considered as a differential diagnosis in HIV patients presenting with cytopenias.

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## VISMODEGIB AS NEOADJUVANT TREATMENT FOR ORBITAL RECURRENT BASAL CELL CARCINOMA FACILITATES EYE-SPARING TUMOR EXCISION

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Periocular basal cell carcinoma (BCC) may be associated with direct invasion of orbital structures. Surgical treatment with orbital exenteration or excision with or without radiation therapy are the recommended treatments resulting in loss of the involved eye. Vismodegib, a hedgehog pathway inhibitor has recently been approved for the treatment of locally advanced or metastatic BCC. Herein, we describe a 49 y/o man with a history of basal cell carcinoma, treated 7 years previously with Moh's surgery and upon 1st recurrence 3 years after the first intervention with resection and flap reconstruction. He developed right lower eyelid ectropion and diplopia with extreme vertical /horizontal gaze. MRI showed a mass with extension to the inferior aspect of right orbit. A biopsy on this right inferior anterior orbital mass showed infiltrating basal cell carcinoma with compromise of the inferior rectus muscle. Surgery and radiation were offered but refused by the patient given the possibility of losing his eye as a consequence of these treatment modalities. Vismodegib, a hedgehog pathway inhibitor, was started at 150 mg po daily. MRI scan at 5 months revealed significant shrinking and no longer invasion of the inferior rectus muscle. Expert panel decided to proceed with surgical excision, orbitotomy, sling and maxillectomy with flap reconstruction, which resulted in tumor removal with preservation of his right eye. Pathological analysis revealed tumor-free surgical margins. *Conclusion:* Vismodegib may be an option in the neoadjuvant setting in basal cell carcinomas involving ocular structures and may aid in eye-sparing surgical interventions.

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## A RARE CASE OF HEPATOCELLULAR CARCINOMA WITH TUMOR THROMBOSIS EXTENDING INTO THE RIGHT ATRIUM OF HEART

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*Case:* A 71-year-old male with no medical history presented with right-sided abdominal pain for two weeks and a weight loss of 20 pounds in 2 months. Vital signs at the time of presentation were within normal limits. Examination revealed tenderness in the right upper quadrant of abdomen and hepatomegaly. A CT scan of abdomen and pelvis showed cirrhosis of liver containing multiple low-attenuation masses including a dominant lesion about 10 cm in size occupying most of the right hepatic lobe. The mass continued to extend superiorly *via* the intrahepatic inferior vena cava (IVC) to the right atrium (RA). Transthoracic echocardiography confirmed an intra-cavitary friable mass in RA in continuation to IVC. Pertinent laboratory findings included alpha fetoprotein marker value of 18,700 IU/ml with normal viral hepatitis panel, cerulosplasmin, ferritin and alpha 1 antitrypsin levels. The patient did not have any history of alcoholism nor any prior liver disease. CT guided needle core biopsy of the right hepatic lobe showed cohesive tumor pattern with poorly differentiated carcinoma in a background of abundant necrosis - findings consistent with hepatocellular carcinoma. Within the next few days, the patient developed hypoxic respiratory failure resulting from venous congestion due to blockage of IVC, and was provided comfort care by his family. *Discussion:* Hepatocellular carcinoma with tumor thrombus extending continuously through IVC and high up into the right atrium is of rare occurrence (1-2). Though it is a terminal form of hepatocellular carcinoma, there have been few isolated case reports where it was successfully treated by extended right anterior segmentectomy and extraction of the TT in the RA under an extracorporeal circulation (3) or non-surgically by transcatheter arterial chemoembolization, radiotherapy and chemotherapy using low-dose thalidomide (1).

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2 Sung AD, Cheng S, Moslehi J, Scully EP, Prior JM and Loscalzo J: Hepatocellular carcinoma with intracavitary cardiac involvement: a case report and review of the literature. Am J Cardiol *102*: 643-645, 2008.
3 Miyazawa M, Torii T, Asano H, Yamada M, Toshimitsu Y, Shinozuka N *et al*: Does a surgery for hepatocellular carcinoma with tumor thrombus highly occupying in the right atrium have significance? A case report and review of the literature. Hepatogastroenterology *52*: 212-216, 2005.

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## SARCOMATOID HEPATOCELLULAR CARCINOMA IN A HIV- AND HCV-POSITIVE PATIENT WITHOUT HISTORY OF PRIOR ANTINEOPLASTIC TREATMENT

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A 54 year-old male patient M with PMH of HIV on HAART who presented to our hospital with complain of abdominal pain, nausea and vomiting. Patient was on HAART therapy for 1 year with an absolute CD4 count of 547. He underwent a CT abdomen which showed a 5.1×5.6×5.7 cm complex, ill-defined mass in segment 8 of the liver. He subsequently underwent an abdominal MRI with liver protocol which showed 4.8 cm lesion in the liver, without enhancement. Given that the radiological finding were more consistent with an abscess patient underwent an IR guided drainage. No drainable fluid was present and the mass was solid. The patient underwent a biopsy which showed sarcomatoid carcinoma. Immunohistochemistry was positive for CAM5.2, keratin AE1/AE3, and vimentin. Tumor cells are negative for desmin, SMA, LCA, CD34, arginase-1, Hep-Par1, glypican-3, HHV8, and CD117. Tumor makers-CA 19-9, CEA and alpha feto protein were negative. Patient tested postive for Hepatitis C antibody with very high RNA titers. The pathogenesis of sacrcomatoid change in HCC is unclear but is believed to be due to the degeneration and regeneration of carcinomas cells due to anticancer therapy and TAE. This causes HCC cells to become multi-potent immature stem cells. But in our patient this was not the case. We propose a different mechanism. HIV and HCV are RNA viruses. HIV and HCV have both shown to cause epithelial-mesenchymal transition (EMT) of cells *in vivo*. EMT is a biological process that allows a polarized epithelial cell, which normally interacts with basement membrane *via* its basal surface, to undergo multiple biochemical changes that enable it to assume a multi-potent mesenchymal cell phenotype. Therefore, we believe confections of HCV and HIV may have induced an EMT transition in HCC cells leading to sarcomatoid carcinoma.

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## AN UNUSUAL COLLISION "LYMPHOPLASMACYTIC LYMPHOMA, BONE MARROW ADENOCARCINOMA AND LUNG MASS. TREATMENT COMPLICATION OR CO-INCIDENCE?

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*Background:* Marrow metastases in non-hematologic tumors are reported in virtually all types of malignancies. Metastatic adenocarcinoma of unknown primary site is a common clinical problem. We present an unusual case of bone marrow lymphoplasmacytic lymphoma followed by metastatic bone marrow adenocarcinoma. *Methods:* We described a patient with bone marrow lymphoplasmacytic lymphoma followed by metastatic bone marrow adenocarcinoma and lung mass. *Results:* 82-year-old male with history of prostate cancer 13 years ago, presented with fatigue and weight loss, and was admitted with symptomatic anemia and bi-cytopenia. Peripheral blood smear showed blast cells. Bone marrow biopsy confirmed CD20, CD19, and CD5 positive B cell Lymphoma. PET-CT showed lymphoma involving bone marrow, spleen and lower right lung. He was started on chemotherapy rituximab and bendamustine, completed 5 cycles with very good tolerance and response. Eight months later he re-presented with fatigue and was found to be pancytopenic. CT chest, abdomen and pelvis showed new lower right lung mass, metastatic liver lesions and lytic bone metastasis. Bone marrow biopsy showed metastatic adenocarcinoma positive for CK-7 and CDX-2, negative for CK-20, TTF-1, PSA and PSAP. Lymphoma was not identified. Lung cancer was thought to be the primary; differentials include gastrointestinal cancers but tissue diagnosis could not be performed because of patient's demise. *Conclusion:* This case could be co-existence of two different malignancies. Treatment of lymphoma, likely made patient immunocompromised and promoted progression of the adenocarcinoma. This raises question: Should tissue diagnosis be done on every organ affected by lymphoma? There have also been case reports of solid tumors emerging post-treatment with rituximab; further studies need to be performed regarding this.

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## A RARE CASE OF SARCOMATOID SQUAMOUS CELL CANCER OF TONGUE AND EVENTUAL PARANEOPLASTIC SYNDROME

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*Background:* Sarcomatoid squamous cell carcinoma (SCC) of the tongue is an unusual and aggressive variant of squamous cell carcinoma, which frequently recurs and metastasizes. Occurrence of paraneoplastic hypercalcemia has rarely been reported with tongue cancer. *Methods:* We describe a patient with metastatic SCC of the tongue, then hypercalcemia with parathyroid hormone-related peptide (PTHrP). *Results:* 73-year-old male with history of anemia presented for evaluation of odynophagia and left tongue mass. Tongue biopsy, confirmed diagnosis of sarcomatoid SCC of tongue, positive for AE1/AE3, p63 and vimentin, negative for S100. Staged T3N2M0 at the time of diagnosis. PET CT showed increased fluorodeoxyglucose uptake in the tongue and 2 neck lymph nodes. He subsequently had hemi-glossectomy and staged neck node dissection. He completed chemo-radiation with cisplatin. Follow-up biopsy was negative for malignancy. The patient however developed first recurrence 5 months later, and chemoradiation was continued. He continued to respond poorly to treatment and was switched to palliative chemotherapy with Paclitaxel and Erbitux. Patient re-presented with anterior neck mass, had total thyroidectomy with pathology confirming metastatic squamous cell cancer from the tongue. Four weeks later, he was re-admitted for altered mental status, found to have hypercalcemia with calcium of 15.5 (normal: 8.8-10.5), albumin 3.6 (normal: 3.5-4.7), Intact PTH 10.4 (normal: 15-65) and PTHrP was also elevated to 31(normal: 14-27). No bone metastasis or hyper-vitaminosis D was found at the time. A diagnosis of paraneoplastic hypercalcemia was made. Hypercalcemia was corrected and the patient was subsequently transferred to hospice care. *Conclusion:* Humoral hypercalcemia of malignancy is a rare and likely unde-recognized complication.

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## GRANULAR CELL TUMOR OF THE BRONCHUS

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*Background:* Granular cell tumors (GCT) are mesenchymal neoplasms, that originate from Schwann cells and are almost always benign. They are known to predominantly involve skin, breast, tongue, or subcutaneous tissue. Pulmonary GCT are rare and roughly half present with obstructive symptoms. Herein we report a case of GCT of the bronchus, which caused partial atelectasis of the lingula. *Case Presentation/Results:* A 56-year-old female presented with two weeks of progressive shortness of breath and wheezing. Chest CT revealed a 1.2 cm × 2.3 cm low density filling defect within the left main stem bronchus extending into the left upper lobe bronchus with resultant lingular atelectasis. There was also a 3 mm polypoid-like lesion seen arising from the anterior wall of the left mainstem bronchus. To rule-out mucus plugging *versus* endobronchial mass a bronchoscopy was performed. During the study a polypoid mass in the distal left mainstem bronchus was seen that was partially occluding the lumen. This was biopsied and sent for pathology. Pathology confirmed the presence of a granular cell tumor, which was positive for S-100 and negative for SMA, CD 34, desmin and CAM 5.2. The patient was transferred to an outside facility where she had endobronchial removal of the lesion. *Conclusion:* Although rare, pulmonary GCT compromise 6-10 % of all granular cell tumors. Thus, it is an important differential when patients present with similar bronchial lesions. The etiology of the bronchial GCT is still not clear, but is believed to be of Schwann cell origin. It is usually benign, but very rarely may be malignant. The question remains if lobectomy, partial pneumonectomy, or endobronchial removal is the best therapeutic option. In this case, the most appropriate treatment was endobronchial removal of the GCT with serial post-surgical follow-up to monitor for signs of recurrence.

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## PRIMARY PULMONARY PLASMACYTOMA IN A PATIENT WITH SJOGREN'S SYNDROME

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*Background:* Plasmacytomas are tumors of plasma cell origin. Solitary plasmacytomas most frequently occur in bone, but can also be extraosseous. Primary pulmonary plasmacytomas are exceptionally rare. Sjogren's syndrome (SS) is a chronic inflammatory autoimmune disease characterized pathologically by lymphocytic infiltration of the exocrine glands. We present a rare case of primary pulmonary plasmacytoma in a patient with SS. *Case Presentation/Results:* A 66-year-old female with a history of SS underwent a chest CT in 2010 showing multiple small lung nodules thought to be secondary to Sjogren's. She underwent a surveillance CT chest in 2012 but in 2015 a CT chest indicated enlargement of a nodule in the right lower lobe. A PET-CT showed a mildly FDG avid 11-mm nodule in the RLL. CT-guided biopsy revealed a plasmacytoma with amyloid deposition. Immunohistochemical stains showed numerous plasma cells highlighted by the CD138 immunostains, which were lambda-restricted. The Congo red stain's apple green birefringence under polarized light presence confirmed the presence of amyloid. The finding of a mass lesion comprised of clonal plasma cells with amyloid deposition was consistent with plasmacytoma. A left iliac bone marrow biopsy showed normocellular marrow (40% cellularity) with maturing trilineage hematopoiesis. Flow cytometry revealed no abnormal

cell populations and no lytic lesions were seen on skeletal survey. Gamma globulins were elevated with an apparent polyclonal pattern on serum protein electrophoresis. Free kappa/lambda light chains were slightly elevated at 2.38. Serum and urine immunofixation were both normal patterns. Further work-up revealed no evidence of metastasis. *Conclusion:* SS has a well-documented association with B-cell lymphoma and a few case reports associated this entity with Multiple Myeloma. Various forms of pulmonary involvement are seen in SS but to best of our knowledge, this is the first reported case of primary pulmonary plasmacytoma in a patient with SS.

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## HIGH-DOSE INTERLEUKIN-2 IMMUNOTHERAPY FOR METASTATIC RENAL CELL CARCINOMA AND MELANOMA: A CONTEMPORARY LOUISIANA EXPERIENCE

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*Background:* Interleukin-2 (IL-2) was approved by the FDA in the 1990s as first-line immunotherapy for metastatic renal cell carcinoma (mRCC) and melanoma (mM). Treatment outcomes have typically been reported as an "objective response rate" (ORR). In 2014, Hughes *et al*. reported that the clinical benefit of IL-2 may be underestimated by ORR and instead suggested that "disease control rate" (DCR) may provide a more meaningful prognostic indicator. *Methods:* A total of 78 patient charts in Baton Rouge, Louisiana from 2011 to 2015 were reviewed. Fifty-eight patients had complete survival and response data. Patients received IL-2 600,000 IU/kg intravenous boluses every 8 hours for up to 14 doses (one cycle), up to 4 cycles. Treatment response was assessed using the Response Evaluation Criteria in Solid Tumors v1.1 after cycle 2, cycle 4, and at each follow-up. Survival analysis was conducted using the Kaplan-Meier method, and differences were compared by the log-rank test using Stata 12.0. *Results:* Patients (n=58) were on average 59.0 years old (range=37-86), 41 males (70.7%), 55 Caucasians (94.8%), and 40 mRCC (18 mM) patients. 6.9% had complete response (CR), 1.7% had partial response (PR), 55.2% had stable disease (SD), and 36.2% had progressive disease (PD). Objective responders (ORR=CR+PR) did not experience death or reach median survival time, while non-responders (SD+PD) had a median 22.7-month survival ($p$=0.0280). SD had a median 25.0 month survival compared to PD with a median 6.2 month survival ($p$=0.0000). Progression-free survivors (DCR=CR+PR+SD) did not reach a median survival time compared to PD ($p$=0.0000). *Conclusion:* In this analyzed cohort, stable disease is significantly associated with longer overall survival compared to progressive disease. These findings support Hughes *et al*. and suggest that defining objective response as the sole meaningful outcome may underestimate the clinical benefit of IL-2 therapy.

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## POEMS SYNDROME PRESENTING AS BILATERAL FOOT DROP AND WEIGHT LOSS: A CASE REPORT

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*Background:* POEMS syndrome is a rare paraneoplastic syndrome associated with an underlying plasma cell disorder. POEMS consists of a complex constellation of manifestations including polyneuropathy, organomegaly, endocrinopathies, monoclonal plasma cell disorder, and skin changes, resulting in the acronym. Other findings in POEMS include sclerotic bone lesions, papilledema, significantly elevated serum vascular endothelial growth factor, and extravascular volume overload. *Methods:* A 66-year-old gentleman presented with a 6-month history of progressive bilateral lower extremity weakness, neuropathic pain in his bilateral feet, and a 60-pound unintentional weight loss. The patient recently underwent electromyography testing at an outside facility which showed moderate peripheral neuropathy with demyelinating features. He was treated at the outside facility with a 5-day course of intravenous immunoglobulin for presumed chronic inflammatory demyelinating polyneuropathy without any significant improvement. On further history and physical examination, he was found to have mild hepatomegaly, splenomegaly, inguinal lymphadenopathy, hypothyroidism, hypoandrogenism, IgG lambda monoclonal gammopathy, and whitening of his fingernails. Due to concern for POEMS syndrome, a positron emission tomography scan was obtained and showed numerous diffuse sclerotic bone lesions, though none with an increased uptake. Bone marrow biopsy revealed plasma cell proliferative disorder with 5-10% lambda light chain restricted plasma cells. Serum vascular endothelial growth factor returned five times the normal limit at 430 pg/ml. *Results:* With his extensive clinical manifestations and serological as well as pathological evidence, the patient was diagnosed with POEMS syndrome and initiated on lenalidomide and dexamethasone therapy. *Conclusion:* POEMS syndrome should be considered in

patients with an underlying plasma cell disorder and other complex clinical manifestations such as polyneuropathy, endocrinopathy, or skin changes.

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## GLIOBLASTOMA MULTIFORMI IN ELDERLY POPULATION: SURVIVAL BENEFIT OF RADIOTHERAPY AND FACTORS ASSOCIATED WITH RECEIPT OF RADIOTHERAPY

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*Background:* Radiotherapy (RT) in elderly patients with glioblastoma multiformi (GBM) after surgery with or without chemotherapy has been shown to have a significant survival benefit in randomized controlled trials but the receipt of radiation therapy as well as the survival benefit of radiation therapy in the general population setting is not known. *Methods:* Surveillance, Epidemiology and End result (SEER) 18 database 2014 was used to identify elderly patient (age ≥70 years) with GBM diagnosed from 1988 to 2010, who had undergone surgery. The population was divided into sub-groups based on age (71 to 80 years and >80 years), sex (male and female), marital status (single, married and separated/ divorced/widowed) and surgery (partial and total resection). The factors associated with receipt of radiotherapy were analyzed using logistic regression. Kaplan-Meier curve, log rank test and Cox-Proportional Hazard Model were used to compute overall survival (OS) and compare OS. *Results:* A total of 4,016 patients were identified out which 67.4% received radiation therapy. Median age at diagnosis was 76 years. OS was significantly better in the RT group (median OS 8±0.151 *vs*. 3±0.079 months, $p<0.001$). Married patients were more likely to receive RT compared to their counterparts but receipt of radiotherapy was comparable among other study groups. Receipt of RT was found to be an independent predictor of better survival (HR of 0.368, 95% CI of 0.343 and 0.396) in multivariate analysis. *Conclusion:* In elderly patients with GBM, RT after surgical resection was associated with significant improvement in OS. Married status was an independent predictor for receipt of RT.

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## SECOND PRIMARY MALIGNANCIES IN GASTROINTESTINAL STROMAL TUMOR: AN ANALYSIS OF THE SEER DATABASE

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*Background:* The occurrence of second primary malignancies (SPM) in patients with gastrointestinal stromal tumors (GIST) has not been well-studied. In this population-based study, we investigated the risk of SPM in patients with GIST. *Methods:* Patients aged >18 years who had GIST diagnosed as the first primary malignancy between January 1992 and December 2011 were selected from the National Cancer Institute's Surveillance, Epidemiology, and End Results Program (SEER) 13 database. SEER*Stat software's Multiple Primary Standardized Incidence Ratio (MP-SIR) session was utilized to find the risk of SPM six months after the index case of GIST. *Results:* Among 2,550 GIST patients, 175 patients (6.86%) developed SPM with observed/expected ratio (O/E ratio) of 1.11, (95% CI=0.95-1.29, $p=0.17$), excess risk of 14.97 per 10,000 population. There was a significantly increased risk of soft tissue tumor including heart [O/E ratio 4.74 (CI=1.29-12.13, $p=0.02$)], excess risk of 2.65 per 10,000 population. The patient's median age at SPM diagnosis was 71.75 years (range=24.33-99 years) and the median latency period was 38 months (range=6 months - 14.75 years). Among 175 SPM patients, 64 cases were detected within the latency period of 6-23 months with O/E ratio of 1.43, (95% CI=1.1-1.83, $p=0.007$). There was significantly increased risk of all solid tumors [O/E ratio 1.45 (CI=1.1-1.88, $p=0.008$)], skin cancers [O/E ratio 3.11 (CI=1.01-7.26, $p=0.04$)] and prostate cancers [O/E ratio 1.96 (CI=1.14-3.13, $p=0.01$)] during the latency period of 6-23 months. There was significantly increased risk of cancers of the stomach [O/E ratio 2.90 (CI=1.17-5.98, $p=0.02$)] and soft tissues including heart [O/E ratio 4.92 (CI=1.01-14.37, $p=0.04$)] in the latency period >24 months. *Conclusion:* Among GIST patients, there is a significantly increased risk of skin and prostate cancer within the first two years of latency and stomach cancer and malignancies of soft tissues including heart after two years of latency.

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## RHABDOMYOLYSIS OBSERVED IN A PATIENT TREATED WITH INTERFERON ALPHA: CASE REPORT

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Rhabdomyolysis is a condition that can cause renal failure, and subsequently multi-organ failure; for that reason, it is important to recognize the early signs and symptoms and consider it as an uncommon but potentially serious side effect of alpha interferon therapy used to treat melanoma. A 39-year-old Hispanic woman with a past history of melanoma

involving the posterior neck was started on high-dose alpha-interferon (20 million IU/m$^2$ intravenously 5 days a week) on February 3, 2014. On March 3, 2014 she complained of muscle aches in both thighs and calves; Laboratory tests showed elevated serum CPK 231 (normal <230 U/L) myoglobin serum 45 mcg/L (normal range <30 mcg/L), BUN 18 mg/dL creatinine 0.80 mg/dL LDH 614 U/L. Oral hydration was started. On March 25, 2014 the laboratory tests showed CPK 188 U/L, serum myoglobin 38 mcg/L BUN 10 mg/dL creatinine 0,80mg/dL, and LDH 568 U/L. IV fluids were given to the patient. On April 1, 2014 the pain had only mildly improved. The CPK was 157 U/L, and serum myoglobin was 34 mcg/L. She was started on prednisone 20 mg bid. High doses of alpha interferon can cause flu-like symptoms that can cover the diagnosis of rhabdomyolysis in these patients; this is why the early assessment for the signs, symptoms and laboratory abnormalities including serum CPK, myoglobin and LDH for rhabdomyolysis should be considered in patients who develop acute myalgia with interferon.

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## ETHNIC DIFFERENCES IN SURVIVAL OF CHRONIC LYMPHOCYTIC LEUKEMIA PATIENTS IN THE UNITED STATES IN LAST TWO DECADES

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*Background:* We conducted this study because there is no current population-based study that assesses the survival pattern of chronic lymphocytic leukemia (CLL) by ethnicity in the United States. *Methods:* We selected CLL patients (≥20 years) from the Surveillance, Epidemiology, and End Results (SEER-13) database. Various cohorts were categorized by race (Caucasian and African Americans), sex (male and female) and age (≥20, 20-65 years and ≥65 years) to measure the 5-year relative survival (RS) rates during two different time frames: 1991-2000 and 2001-2010. We used Z-test to compare survival rates. *Results:* The database comprised of 53,999 patients. 31,586 were males and 22,413 were females. Likewise, 47,797 were Caucasians and 3,825 were African Americans. The RS of CLL patients has improved in the period 2001-2010 compared to 1991-2000 (79.4±0.3 *vs*. 73.3 ±0.5, Z-score=11.799). Survival rates of Caucasians have improved (overall: 79.8± 0.3 *vs*. 74.2± 0.5, Z-score=10.293) in both sexes (male: 78.8±0.4 *vs*. 72.9±0.6, Z-score=7.995; female: 81.2±0.5 Vs76.0±0.7, Z-score=6.458) and all the age groups (20-65 years: 88.7±0.4 *vs*. 83.6±0.6, Z-score=7.620; ≥65 years: 74.4±0.5 *vs*. 68.9±0.7, Z-score=7.541). Quite interestingly, there was a substantial improvement in survival for the African Americans (AA) in the period 2001-2010: 69.2±1.2 *vs*. 59.7±1.8, Z-score=4.544. This improvement is seen in both sexes (male: 66.3±1.6 *vs*. 55.9±2.4, Z-score=3.408; female: 73.0±1.8 *vs*. 64.7±2.7, Z-score=2.886) and all the age groups (20-65 years: 75.3±1.5 *vs*. 66.5±2.3, Z-score=3.328; ≥65 years: 63.7±1.9 *vs*. 53.8±2.7, Z-score=3.228). And lastly, Caucasians have better survival benefit compared to AA in all time frames under consideration. *Conclusion:* Survival rates of CLL patients have significantly improved in recent decade. The improvement in 5-year relative survival rate was seen in all ethnic groups.

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## PRIMARY SQUAMOUS CELL CARCINOMA OF THE TOE MASQUERADING AS OSTEOMYELITIS: A CASE REPORT

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*Case Presentation:* A 56-year-old male with PMH of hypertension presented to our hospital with left great toe pain. Patient had noticed increased redness, swelling and pain in his left great toe for the last 3 weeks. He also complained of a pin-point wound on his toe with increased discharge. Given concern for osteomyelitis, an MRI of the left foot was obtained which revealed mixture of edematous soft tissue and fluid loculations along the lateral aspect of the great toe measuring 17×10×16 mm with erosion of the adjacent cortex of the distal first phalanx, most likely reflecting phlegmonous soft tissue and osteomyelitis. Patient was started on IV antibiotics. He underwent a bone biopsy for tissue culture which revealed a well-differentiated squamous cell carcinoma. Subsequently he underwent an amputation of the great toe. The pathology showed a well-differentiated squamous cell carcinoma of the skin invading bone. There was no evidence of osteomyelitis in the pathology sample. CT of the chest and abdomen, that were performed to rule-out any other primary focus for squamous carcinoma were negative. *Discussion:* Primary squamous cell carcinoma of the foot is a rare occurrence with an unreported incidence in literature. It can arise from pre-existing lesions like lichen planus, deep mycosis, lichen simplex chronicus, plantar verruca, area of prior trauma or burn injury. It can present as a nodule, ulcerative lesion or an exophytic mass. Our case is unique in 2 ways. First, it did not arise from any pre-existing lesion. Second, the presentation of the carcinoma as a soft tissue swelling with erosion into the bone and discharge, mimicked osteomyelitis. If the disease is localized to one phalanx as in our patient, amputation can be curative.