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**Background:** Malignant pleural mesotheliomas (MPMs) is a fatal disease mainly caused by past exposure to asbestos. MPMs are classified into three main histological subtypes: epithelioid, sarcomatoid, and biphasic type. There have been known several immunopathological markers for diagnosing MPMs, but there are not enough reliable markers, which often makes it difficult to diagnose MPMs correctly. In the present study, we investigated whether Claudin15 serves as a diagnostic and therapeutic target for MPMs. Claudins are four-transmembrane proteins and form a protein family consisting 27 members in humans. Specific combination of claudins are differentially expressed in different organs and form tight junctions with different permeability. Expression of Claudin15 has been known to be increased at mRNA level in MPMs. **Method:** Since 2003 to 2018, 34 patients were diagnosed with MPMs in our hospital. We made a new anti-Claudin15 rat monoclonal antibody, and established a hybridoma clone suitable for IHC. We immunostained 34 tissues with newly established anti-Claudin15 antibody, and compared the staining intensity and occupation with those of Calretinin, a known marker for MPMs. We also immunostained poorly differentiated lung adenocarcinomas, which are sometimes hardly distinguishable with MPMs, with anti-Claudin15 antibody to examine whether Claudin15 staining can distinguish MPMs from adenocarcinomas. **Result:** Of the 34 cases, the epithelial type was 27 cases, the sarcomatoid type was 1 case, and the biphasic type was 6 cases. The overall expression rate was 53% for Claudin15 and 59% for Calretinin. In terms of histology type, Claudin15 was 50% and Calretinin was 65% in the epithelial type, while Claudin15 was 80% and Calretinin was 40% in the biphasic type. There was only one sarcomatoid type, neither was expressed. Poorly differentiated adenocarcinomas showed no or very low-level expression of Claudin15. **Conclusion:** Our results suggest that Claudin15 could be a novel diagnostic marker for MPMs, especially for biphasic type. Greater number of cases and further analyses would be required to establish Claudin15 as a diagnostic impact for MPMs in clinical use. **Keywords:** malignant pleural mesothelioma, Claudin, tight junctions

## P2.06-21

### Efficacy and Safety of Tumor Treating Fields Delivery to the Thorax by Computational Simulations



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**Background:** Tumor Treating Fields (TTFields), an anti-mitotic therapy low intensity, intermediate frequency, alternating electric fields, are approved for glioblastoma. The STELLAR phase 2 registration trial recently demonstrated a significant extension in overall survival in mesothelioma patients treated with TTFields and standard of care chemotherapy vs historical control data on chemotherapy alone. The results highlight the potential benefit of TTFields to treat cancer located in the thorax. Preclinical studies show that efficacy increases with the intensity of the electric field. Optimizing treatment requires a thorough understanding of how TTFields distribute within the body. Simulations can be used to evaluate the treatment safety by assessing tissue heating associated with absorption of the electric field. We present a simulation based study on field distribution and associated heating when delivering TTFields to the thorax. **Method:** We delivered TTFields to the thorax of realistic computational phantoms of a male, female, and obese male (ZMT, Zurich, Switzerland). The field was delivered to the computational phantoms using transducer arrays similar to those used to deliver TTFields to the thorax with the NovoTTF-100L. The field intensities within the lungs of the models were evaluated. Specific Absorption Rate (SAR), a metric for assessing heating due to electromagnetic absorption, was calculated. **Result:** The highest field intensities within the lungs were obtained when the arrays were axially-

aligned with the parenchyma as anatomically possible. Field intensities throughout the lungs exceeded the therapeutic threshold of 1 V/cm in all models. Within the internal organs, SAR values were below the allowed level of 10 W/kg set out in the ICNIRP guidelines for occupational exposure. Maximum SAR levels did not exceed 20 W/kg. Occupational exposure standards typically incorporate a safety factor of around 10 when setting basic restrictions, therefore this level of SAR is considered safe and unlikely to lead to heat-related tissue damage. **Conclusion:** TTFields can be delivered to the lungs at therapeutic levels that do not cause damage through tissue heating. **Keywords:** Tumor Treating Fields, Efficacy, Safety

## P2.06-22

### Is Laboratory Prognostic Index a Valuable Prognostic Index for Malignant Pleural Mesothelioma?



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**Background:** Prognostic significance of Laboratory Prognostic Index (LPI) was demonstrated in non-small cell lung cancer before. We aimed to assess the prognostic value of LPI in patients with malignant pleural mesothelioma (MPM). **Method:** Records of MPM patients were examined retrospectively for serum laboratory results at diagnosis along with demographical and clinicopathological features. LPI is consisted of white blood cell count ( $>10000/\text{mm}^3$ ), albumin ( $<3.5 \text{ g/dL}$ ), lactate dehydrogenase ( $>248 \text{ U/L}$ ), alkaline phosphatase ( $>120 \text{ U/L}$ ) and calcium ( $>10.5 \text{ mg/dL}$ ) levels; and it is graded according to the number of abnormal parameters: 0 (none), 1 (one) and 2 (two or more). Kaplan-Meier method and stratified log-rank test were used in univariate analysis and a Cox regression model was conducted to determine independent predictors of overall survival (OS). **Result:** Sixty-one patients were included in the study. Median age at diagnosis was 59 (51-66) years. 45 deaths (73.8%) have occurred at the time of final analysis and median OS was 19.5 months. One-year survival rates for patients with LPI 0, 1 and 2, were 82%, 61% and 59%; 2-year survival rates were 75%, 47% and 24%, respectively. Median OS of patients with LPI 0, 1 and 2 were 36.5, 21.7 and 15.6 months, respectively ( $p=0.007$ ). Age, ECOG performance status, histology, hemoglobin level and LPI were found to effect OS significantly or to have a trend ( $p<0.1$ ). In multivariate analysis, LPI ( $p=0.033$ ) and ECOG performance status ( $p<0.001$ ) were the independent prognostic factors. **Conclusion:** The LPI may be a valuable prognostic factor in mesothelioma as well. Larger studies are needed to confirm this result.

## P2.06-23

### The Accuracy of Video-Assisted Thoracic Surgery Pleural Biopsy in Patients with Suspected Malignant Pleural Mesothelioma: A Real-Life Study



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