CRYODESTRUCTION AND DRUG PENETRATION IN CANCER TISSUE – A PRELIMINARY ANALYSIS.

Adam Rzechonek[1], Piotr Błasiak[1], Piotr Cierpikowski[1], Beata Muszczyńska[3], Grzegorz Pniewski[3], Olga Michel[4], Jolanta Saczko[4], Julita Kulbacka[4], Jędrzej Grzegrzółka[5], Patrick le Pivert[2]

[1] Department of Thoracic Surgery, Wroclaw Medicla University, Grabiszynska 105, 53-439 Wroclaw, Poland

[2] Interventional Drug Delivery Systems and Strategies, 6698 Lakeland Court, Jupiter, FL 33458, USA

[3] Department of Pathology, Lower Silesian Centre of Lung Diseases, Grabiszynska 105, 53-439 Wroclaw, Poland

[4] Department of Medical Biochemistry, Chałubińskiego 10, 50-368 Wroclaw, Poland

[5] Department of Histology and Embryology, Wroclaw Medical University, Chalubinskiego 6A, 50-368 Wroclaw, Poland

Aim:

The aim of the study was the evaluation of MB (methylene blue) penetration into the cryodestructed part of the lung cancer.

Materials and Methods:

Macroscopic evaluation of 28 lung tumors (various histological forms, mostly adenocarcinomas -14 squamous-5, other-9) was performed.

The tumors were treated with 2 freezing cycles, using a nitrous oxide cryoprobe. The induced iceball was 18-20mm. The MB was injected beside of the cryoprobe. The tumor section photographs were evaluated using a four grade scale.

Results:

The iceball produced some limitation of MB distribution, but the picture was different in various histopathological types. In majority of cases (64%) cases the MB marker did not penetrate more than 50% of the diameter of the iceball, but in the 10 cases (34%) the penetration exceeded 50% of diameter. In 7 cases the penetration reached more than 75% of tumor diameter, especially in large cell carcinomas 3/28(11%) and in some adenocarcinomas (11%).

Conclusions:

The iceball in the tumor is not a strong distribution barrier. It seems that in the large cell cancer, the MB penetration was better than in other histopathological types. These observations shall be practically useful in the local application of hydrophobic cytostatics.