

**SMALL CLOSED PNEUMOTHORAX CONJUGATED MECHANICAL- FLUID ANALYSIS USING FAST MODELLING MES 3D METHOD.**

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**Background:**

Posttraumatic pneumothorax still remains to be a serious clinical problem and requires comprehensive diagnostics and monitoring during treatment. The aim of this paper is developing a method of small closed pneumothorax fast computer modelling.

**Material and Methods:**

Radiological images of 34 patients of both sexes with small closed pneumothorax were taken into consideration. The control group consisted of x-rays of 22 patients treated because of tension pneumothorax. In every single case the model was correlated with the clinic.

Using computer tomography, a MES model of small closed pneumothorax was created. In order to run MES modelling, a CT2FEM 1.0 program and MES ANSYS Workbench analysis system were used. A CT2FEM enabled an automatic conversion of CT images into MES 3D model. This program assigns shades of grey of bitmaps images to the material features of MES model. It also segmentises it into 16 groups, what enables other boolean operations. After importing the APDL standard of MES model into ANSYS system, a model distribution into structural and fluid part was made. It enabled the performance of conjugated mechanical-fluid analysis for investigated object. Results:

Achieved model was compatible with the clinic. It simplified diagnostics and prognosis of the treatment in the case of small closed pneumothorax.

**Conclusions:**

The created MES model seems to be representative of the course and assessment of parameters in the case of small closed pneumothorax.

Researches are initial and need to be continued in the future.