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ECG Changes in Pneumothorax Patients Presenting to the Emergency Department

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Objectives: Pneumothorax, which is one of the significant disorders included in the differential diagnosis of patients presenting to emergency departments with complaints like shortness of breath and chest pain, can lead to life-threatening consequences. Various ECG findings can be seen in patients with pneumothorax and it has been reported that ECG findings may mimic anterior myocardial ischemia. A retrospective analysis of patients with pneumothorax admitted to our emergency department was performed and ECG changes in patients with pneumothorax were investigated. It was aimed to help physicians with diagnosis, treatment, observation and prediction of prognosis in daily emergency department practice.

Methods: Totally 147 pneumothorax cases, admitted to our emergency Department and evaluated by the same Thoracic surgeon between April 1st, 2014 and April 1st, 2017 were recruited into the study. The study was designed as a retrospective cross-sectional study. The patients' physical examination findings, medical history, ECGs, the results of routine blood tests, direct X-ray and tomographic findings, treatments given, duration of hospitalization and out-patient follow-up were examined using the hospital data-processing system, patient files and archive data. Significance of the acquired data was evaluated by various statistical tests.

Results: Among 147 participants 84.4% (n=130) were male; 32.7% (n=48) were traffic accident cases; 25.9% (n=38) were spontaneous pneumothorax; 23.1% (n=34) were formed by cases of fall, and 18.4% were admitted to the emergency department due to another urgent condition. PA chest X-Ray was evaluated to be normal in 16.3% (n=24) of the patients; it showed right-sided pneumothorax in 32.0% (n=47), and left-sided pneumothorax in 16.3% (n=24). Thoracic CT showed right-sided pneumothorax in 48.2% (n=71), left-sided pneumothorax in 42.8% (n=63) and bilateral pneumothorax in 8.8% (n=13) of the patients. Patients with spontaneous pneumothorax were more likely to have a pneumothorax filling more than 20% of the hemithorax ($p<0.001$). Besides, those patients had abnormal findings more frequently on the ECG taken on admission ($p=0.004$).

Conclusion: Pneumothorax is another important diagnosis that may lead to ST segment elevation in patients' ECGs, as in myocardial infarction, which is the most important diagnosis that should be considered in patients presenting to the emergency department with chest pain and dyspnea. Especially in patients with pneumothorax diagnosed more than 20%, there were significant ECG changes in terms of pneumothorax.

Keywords: Pneumothorax, Size, ECG