

Is a Postoperative Chest Radiograph Necessary After Open Reduction and Internal Fixation of a Clavicle Fracture in a Trauma Population?

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Purpose: Controversy remains over the usefulness of a postoperative chest radiograph (CXR) after open reduction and internal fixation (ORIF) of the clavicle when associated with concomitant thoracic injury. This study was performed to determine if certain subsets of patients are at increased risk for postoperative pathology on CXR after ORIF of the clavicle.

Methods: A consecutive series of patients at our Level I trauma center were retrospectively reviewed after ORIF of the clavicle. All patients included were treated surgically with superior plating technique and had a postoperative CXR. Each postoperative CXR was evaluated for new or worsened pulmonary contusion, pneumothorax (PTX), and pleural effusion. Risk factors were evaluated as predictors of a pathologic postoperative CXR and included preoperative pulmonary injury, preoperatively placed chest tube, and concomitant rib fractures.

Results: 76 patients were included in the series, including 57 men and 19 women, with an average age of 41.6 years. All patients had postoperative CXRs performed. All were treated with ORIF with superior clavicle plating. According to the OTA classification there were two 15A, forty 15B1, twenty-five 15B2, four 15B3, and five 15C clavicle fractures. 13 patients had a preoperative PTX on CXR and 13 patients had a preoperative PTX on chest CT only. There were 45 patients with rib fractures, 11 patients with chest tubes placed before orthopaedic intervention, and 30 orthopaedic polytrauma patients. Postoperative CXR diagnosed 0/23 (0%) PTX in patients with neither preoperative pulmonary injury nor rib fractures. The postoperative CXR showed presence of a PTX in 1/31 (3.2%) of patients without concomitant rib fractures and in 6/45 (13.3%) of patients with rib fractures. Postoperative CXR showed increased sized of PTX postoperatively in 2/13 (15.4%) patients with PTX visible on preoperative chest CT only and not treated with preoperative chest tube; both patients required postoperative chest tube placement. Seven of 76 patients had PTX visible on postoperative CXR; 2 were new PTX, 3 were stable, and 2 increased in size but did not require intervention. Two of 76 (2.6%) had postoperative pleural effusions seen on CXR, which were treated with chest tube placement in 1/2 (50%) of these patients. The patients with chest tube placement preoperatively had visible PTX on postoperative CXR in 4/11 (36.4%) patients, but the PTX increased in size in only 1/11 (9.1%).

Conclusion: No postoperative CXR is recommended after ORIF of isolated clavicle fractures. However, clavicle fracture patients with concomitant preoperative chest trauma should have postoperative chest radiographs due to the risk of pulmonary complications. These risks are most likely due traumatic injury to the lungs and chest wall, and must be considered in a trauma population.