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Misplaced Chest Drain: A Narrow Escape

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Abstract
Chest drain is commonly performed lifesaving procedure. Chances of cardiac injury after chest drain placement are more if there is cardiomegaly, dense pleural adhesions, kyphoscoliosis, or post lung injury or surgery. Proper technique, thinner drains and use of image guidance like ultrasound, fluoroscopy or computed tomography can reduce the catastrophic complications. Only 18 cases of cardiac injury following chest drain placement are reported, we present a case of polytrauma who had a near miss cardiac catastrophic event following chest drain placement for pneumothorax.
Keywords: *Misplaced drain, cardiac injury, intercostal drain (ICD), complication.*

Background

Chest drain is commonly performed lifesaving procedure in emergency for management of pneumothorax, pleural effusion or empyema.[1] During world war II this procedure gained popularity for treatment of polytrauma patient with chest injury, although it was initially described in 1876 by Hewitt.[2] There have been many modifications later in the technique to decrease the complications. The major complication like laceration of the lung, heart, diaphragm, and other organs can be reduced if the procedure is carried out properly. Only 18 cases of cardiac injury following chest drain placement are reported, we present a case of polytrauma who had a near miss cardiac catastrophic event following chest drain placement for pneumothorax.[3]

Case Report

A 65-year-old male patient presented at the emergency department with alleged history of fall from height few hours ago and sustained polytrauma. He had history of loss of consciousness, and left ear bleed. And also history injury to left side chest wall. No history of seizure and vomiting. On examination general condition was poor, irritable, intermittently following commands, pupils normal reacting, moving all limbs equally. HR was 80 per minute regular, blood pressure 126/78 mm Hg, and saturation 97 percent on room air. Tenderness was present over left chest region. He was treated as per hospital protocol of polytrauma care in emergency. Computed tomography of brain right frontal and temporal contusion with thin subdural haemorrhage without mass effect and left

temporal fracture. Cervical spine imaging was normal. And was managed with medications and neuromonitoring conservatively. Chest compression test was positive. His X-ray chest showed left side pneumothorax and fracture of left 8th to 11th ribs. eFAST (extended focused assessment with sonography in trauma) was negative. In view of pneumothorax, intercostal drain was inserted by junior doctor on duty under supervision. Triangle of safety was identified and under all aseptic precautions, 32 French gauge drain (Romo Drain, DB-5052, India) was inserted in left 5th intercostal space in midaxillary line and attached to underwater seal. Patients vital remained stable post procedure. Post procedure X-ray showed doubtful malposition of tube so computed tomography of chest done which showed chest tube near to left ventricle of heart. [Fig 1] It was immediately removed and fresh chest drain was inserted. Drain was removed after 3 days after confirming no hemopneumothorax. Fortunately patient did not have any complications, his neurological status also improved was conscious, alter, ambulant and was discharged in stable condition after 5 days.

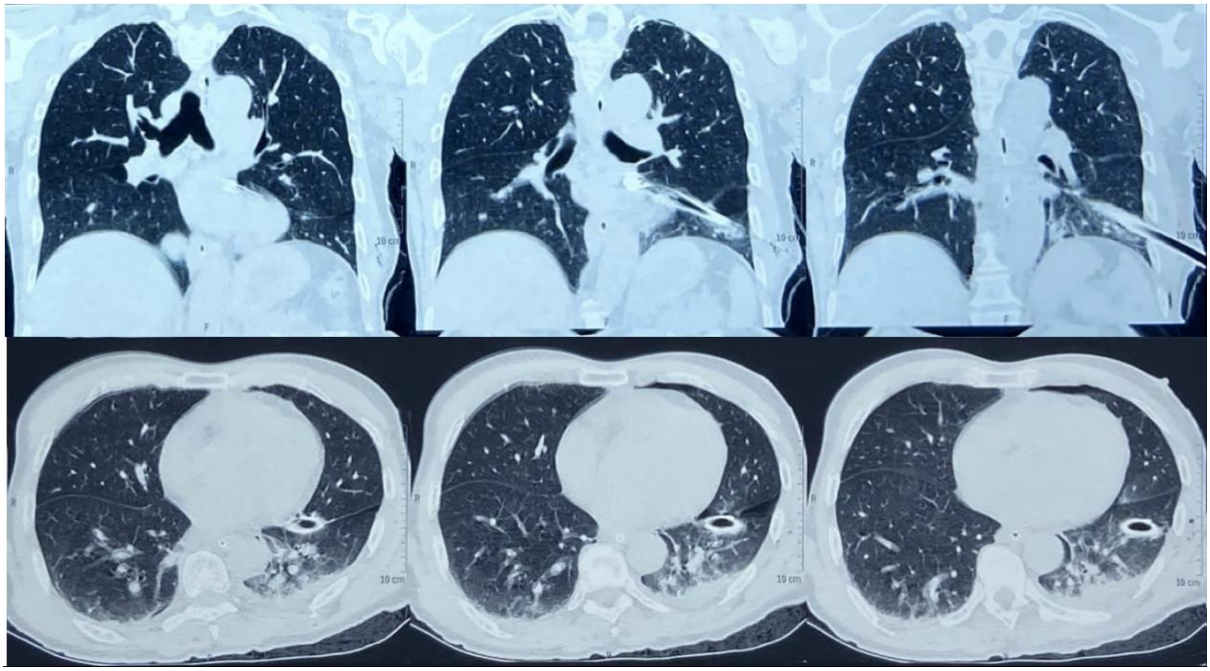

Fig: CT Chest showing the chest tube near to left ventricle of heart.

Discussion

Chest drain related complication are reported to be 30 %, although major complications are rare. Injury to heart can be a worst nightmare for emergency team.[4] Chances of cardiac injury are more if there is cardiomegaly, dense pleural adhesions, kyphoscoliosis, or post lung injury or surgery.[5] About 18 cases with cardiac injury are reported in literature, our case is near miss without any cardiac injury. Out of the 18 cases, 13 (72.2%) cases survived. The present case also made a significant recovery.[3]

The malposition of chest tube may lead to retention of pneumothorax or hemothorax, which may require additional chest tube insertion or surgery.[6] Guidelines for safe chest drain placement are given by British Thoracic Society (BTS).[1] Safe triangle should be used for drain insertion which is bound bounded anteromedially by the lateral border of pectoralis major, inferiorly by a horizontal line at the level of the nipples, and posteriorly by the anterior border of latissimus dorsi. In case of insertion of smaller chest drain ultrasound guidance followed by Seldinger's technique is described. 24 to 32 Fg drains should

be inserted after blunt dissection and digital palpation. Thinner drains are recommended as these chest tubes proven to be as efficient as large bore drain.[7] If initial aspiration fails that image guidance – ultrasound or fluoroscope is recommended if the effusion is very small. Thoracotomy may be required in some cases who had cardiac injury despite all precautions.[8]

Conclusion

To err is human, but to learn from the complication and its further avoidance is progress. Complications should be avoided by presumption and vigilance. Chest drain placement is a safe and lifesaving procedure, cardiac injury complications are very rare. Thinner drains are preferable and image guidance should be used wherever warranted.

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