(***Refer to page 171***)

Answer: Misplacement of the chest tube

The contrast axial CT scan (**Panel**) revealed that the tip of the chest tube was lying just anterior to the descending thoracic aorta, abutting it and lateral to the oesophagus in the midline. This was correct with tube withdrawal and adjustment.

Chest tube insertion is a common procedure. It is used to drain fluid (pleural effusion, blood, chyle, pus) and air from the pleural cavity. It is usually performed in most cases during emergency situations for trauma involving the thoracic cavity by a variety of medical personnel, though commonly by the residents. The rate of successful insertion and the magnitude of the complication that may arise are largely operator-dependent. Tube placements outside trauma bay and by the non-surgical residents were independently predictive of complications. [1]

Occlusion of the tube by thrombus is one of the commonest complications, which fortunately is not operator dependent. Modification to the material used, such as phosphatydylcholine-coated tube, can minimise the risk of thrombus formation in the tube, thus reducing post-procedure morbidity. [2] The usage of appropriate size of tube also plays a role in avoiding tube blockage; large caliber chest tubes such as 28 to 32 French sizes are used to drain fluid of thicker consistency such pus or blood while small caliber chest drain with sizes ranging from 20-24 French are more commonly inserted for pneumothorax. Complications, which are operator-related can be divided into insertional, positional and infective. [1]

Closed method technique in unskilled hands are more likely to cause more complications as it may be forcefully inserted into vital structures such as lung parenchyma or cardiac chambers, which is avoided when performed through open insertion technique. Inserting chest drain too low along the chest wall may predispose to iatrogenic intra-abdominal organ injury, most commonly reported are liver and spleen. [3] Apart from this, massive bleeding and nerve injury can also occur if the chest tube is inserted just below the adjacent ribs. Foreknowledge of these avoidable complications is of paramount importance in order to reduce patients' morbidity.

These examples highlight the importance of correct technique of chest tube insertion. Over-forceful advancement of the chest tube can lead to catastrophic and fatal events such as aortic or cardiac complications. Nerve injuries to the sympathetic chain, phrenic, ulnar and long thoracic nerves have also been reported. [4] Adherence to the triangle of safety can limit the error. Complications, once encountered, must be addressed promptly with proper corrective measures.

REFERENCES

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