An unusual case of subcutaneous emphysema without pneumothorax following brachial plexus block

Sir,

Brachial plexus block is the anesthetic technique of choice for surgeries of upper limb. The most common complication of brachial plexus block using supraclavicular approach is pneumothorax with incidence of 0.5-6%.[1] The presence of subcutaneous emphysema in the postoperative period suggests the presence of a pneumothorax or it may be secondary to thoracic trauma.[2] Subcutaneous emphysema in the absence of either of these is a rare phenomenon.

A 42-year-old male patient presented to our hospital 4 days after crush injury to the left hand. There was no history of head injury, chest, or abdominal trauma. He was afebrile, and all preoperative laboratory parameters were within normal limits. He was operated for fixation of fracture of head of second metacarpal bone with K-wire under supraclavicular brachial plexus block. An electrically driven drill was used to pass the K-wire. The intraoperative hemodynamics were stable, and surgery was uneventful. In the postoperative ward, 8 h after surgery, patient developed diffuse subcutaneous emphysema over the left hemithorax and left upper limb extending up to the elbow joint without any signs or symptoms of respiratory distress. Chest X-ray revealed changes of chronic obstructive pulmonary disease (COPD) without any evidence of pneumothorax. As the patient was hemodynamically stable, he was closely monitored and treated conservatively with high flow oxygen, which hastened the reabsorption of air by denitrification of the blood.[2] Injection diclofenac 75 mg was given twice daily for pain relief and the emphysema was drained by multiple skin punctures with a sterile needle. Consequently on the 4th postoperative day, subcutaneous emphysema resolved completely without any sequel and the patient was discharged home.

Subcutaneous emphysema develops frequently following blunt or penetrating chest injury involving larynx, trachea or bronchi. In the present case, it may be a symptom of a serious underlying cause like pneumothorax due to puncture of pleura.[2] If the size of puncture on the lung surface is small it may be sealed off before symptomatic pneumothorax develops.[1] Patients with a small pneumothorax (<15% of the hemithorax) often have normal physical findings on examination. The physical findings may be masked by the underlying lung disease, particularly in patients with COPD as was seen in our case. Chronic lung conditions give rise to adhesions between the parietal and visceral pleura restricting lung collapse. In such situations, a pneumothorax may be loculated and localized rather than spreading throughout the pleural space.[3] The air so trapped escapes into the path of least resistance that is, the subcutaneous plane. Thus, pneumothoraces occurring in patients with COPD are at a greater risk of being complicated by subcutaneous emphysema.[4] Lack of systemic illness and normal inflammatory indices rule out gas gangrene in our case. Pneumatic drills have been implicated as causative factors for the development of benign subcutaneous emphysema.[5] However, the K-wire was electrically driven in our case. Although subcutaneous emphysema is usually benign, it will require prompt intervention to allay patient

anxiety and to prevent complications such as dysphagia, visual disturbance, respiratory failure, airway compromise, systemic air embolism, cardiac compromise, pacemaker dysfunction, and sudden death.[4]

Supraclavicular brachial plexus blocks are frequently used in settings like day care surgeries. Awareness of the possibility of occurrence of this condition as seen in our case can go a long way in preventing serious morbidity and mortality.

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