Spontaneous pneumomediastinum, pneumothorax, pneumorrhachis, pneumoretroperitoneum, surgical emphysema

Sir,

Spontaneous pneumomediastinum, pneumothorax, pneumorrhachis, pneumoretroperitoneum, and surgical emphysema together are very rare and usually self-limiting. The most common cause can be esophageal and chest trauma.

A 16-year-old male patient with biopsy proven cerebral germinoma presented to the emergency department with altered sensorium, swelling, and stiffness of the neck and chest. He was continuously straining manually due to unknown cause. Chest radiograph and computed tomography (CT) revealed pneumomediastinum, pneumothorax, surgical emphysema, pneumorrhachis, and pneumoretroperitoneum. The patient was followed conservatively and completely recovered over the next 15 days. There was no definite cause of spontaneous pneumomediastinum, pneumothorax, surgical emphysema, pneumorrhachis, and pneumoretroperitoneum in this patient. Presumably air leakage was secondary to the excessive elevation of intrathoracic pressure due to manual straining which is an uncommon cause and remains largely underdiagnosed clinically, especially in young, healthy patients. On examination, subcutaneous crepitations were palpable across his neck and the superior part of his chest.

Chest radiograph [Figure 1] showed extensive surgical emphysema over the neck, anterior and lateral chest wall, mild to moderate left pneumothorax, and pneumomediastinum. On CT scan [Figure 2], without oral and with intravenous contrast, the radiographic findings were confirmed and in addition demonstrated bilateral pneumothorax, pneumorrhachis, and pneumoretroperitoneum. Bilateral lung parenchyma was normal except for small fibrotic strands in the upper lobes. There was mild thinning of the distal esophageal wall, and CT scan was repeated with oral contrast to demonstrate any leakage of contrast, however, there was no leak and the esophageal wall was intact. Magnetic resonance imaging (MRI) of the brain [Figure 3] showed residual germinoma.

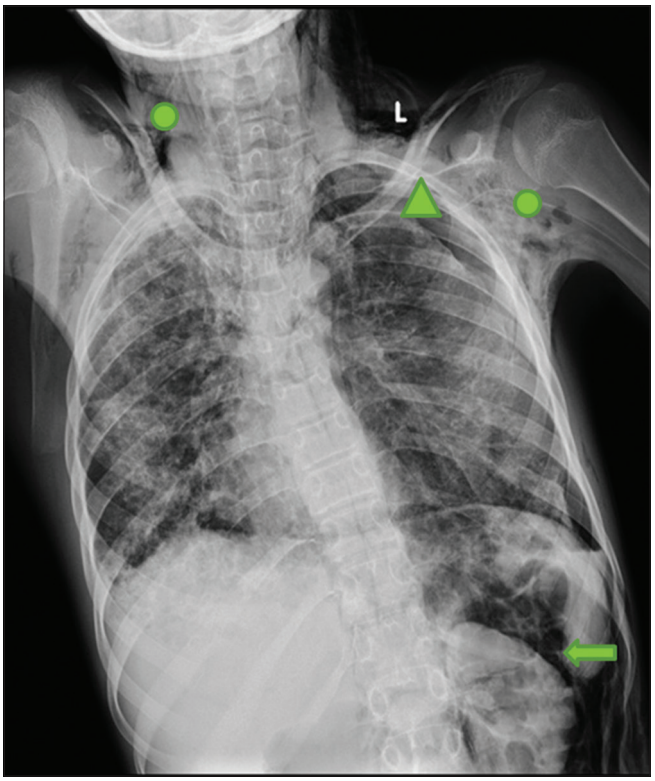

Figure 1: Chest radiograph taken in AP view demonstrating the surgical emphysema (circle) in the neck and chest bilaterally, left pneumothorax (triangle), signs of pneumomediatinum namely air outlining the descending aorta and the diaphragm giving a continuous diaphragm sign and pneumoretroperitoneum outlining the left renal shadow (arrow)

Spontaneous pneumomediastinum, pneumothorax, pneumoretroperitoneum, pneumorrhachis, and surgical emphysema also occur spontaneously in the setting of elevated intrathoracic pressure as a result of mechanical ventilation, excessive coughing, vomiting, Valsalva manoeuvre, childbirth, and forceful straining during exercise.[1] These have a good prognosis with very rare recurrence and complications.[2] The air travels through the least resistant zones. There exists an anatomical continuity of the fascial planes of the neck, chest, abdomen,

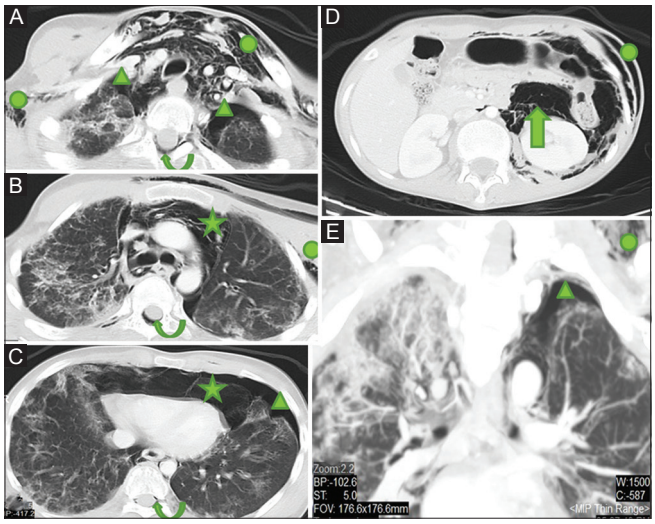

Figure 2 (A-E): CT axial sections of chest with (A) pneumothorax (triangle), surgical emphysema (circle), pneumorrhachis (curved arrow), and fibrotic changes in the lung parenchyma; (B) pneumomediastinum (star), surgical emphysema (circle), and pneumorrhachis (curved arrow); (C) pneumothorax (triangle), pneumomediastinum (star), and pneumorrhachis (curved arrow); (D) surgical emphysema (circle), pneumoretroperitoneum (straight arrow); (E) CT coronal section of apical region showing pneumothorax

retroperitoneum, and epidural space.[3] This explained the extraneous air in this patient.

Clinical and radiological evaluation is done to evaluate the condition, and most often the clinical findings are nonspecific. Radiological assessment is necessary to evaluate the extraluminal air and asses the possible etiology. At present, CT appears to be the imaging modality of choice to see even a minimal volume of extraluminal air in the body.[4] Diagnosis is made most commonly by chest X-ray, which reveals air in subcutaneous tissues, mediastinum, and thorax. Small pneumomediastinum may not be seen on chest X-ray but can be detected on chest CT. Abdomen CT scan plays an important role in identifying an occult perforation of hollow viscous, and whole body CT allows us to evaluate the extension of escaped gas to different body parts.

Hence, in cases of suspected extraneous air, we recommend performing a CT, which is the most preferable diagnostic tool for the detection of air in soft tissues[5] and helps to assess the cause, location, and amount of air for early management. Radiological imaging also plays an important role in allowing a proper therapeutic planning and follow-up.

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Conflicts of interest
There are no conflicts of interest.

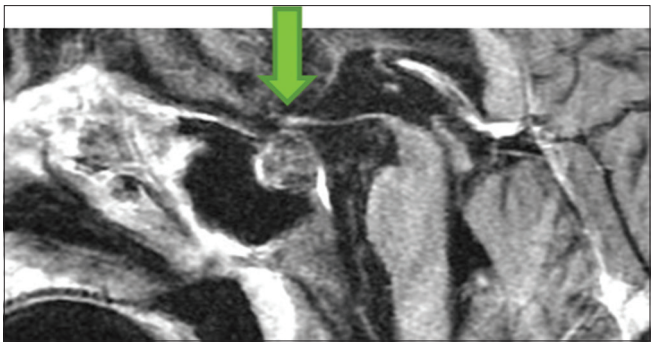

Figure 3: Sagittal section of contrast enhanced MRI showing a heterogeneously enhancing sellar and supra sellar mass suggesting residual germinoma (arrow)

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