Inhalation Marijuana associated pneumothorax, pneumomediastinum and subcutaneous emphysema: A rarely reported clinical entity

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Introduction

Cannabinoid use is associated with cyclic vomiting syndrome. Association of pneumothorax, pneumomediastinum, and subcutaneous emphysema with cannabinoid use has been rarely reported in the medical literature. The infrequency with which it is encountered makes it a management challenge

Case History

- A 20-year-old male with a history of cyclic vomiting syndrome due to cannabinoid abuse presented with nausea ,vomiting and localized epigastric pain.
- An abdominal CT scan was negative for any acute Intra-abdominal pathology but showed right-sided pneumothorax. CT chest showed non-tension right-sided pneumothorax [Fig-1] with an extensive pneumomediastinum [Fig- 2,3]. X-ray chest showed subcutaneous emphysema in the neck. Esophagogram was negative for any leak [Fig-4]. A urine drug screen was positive for cannabinoids. Patient had elevated creatinine and lactic acidosis.
- No intervention was recommended by cardiothoracic surgery. The patient had conservative management with the resolution of symptoms and lab abnormalities with significant improvement in imaging studies.
- Patient was discharged home with a recommendation for outpatient chest imaging in 6 weeks and avoidance of cannabinoids use in the future.

Discussion

- Inhalational Marijuana associated lung injury including spontaneous pneumothorax, pneumomediastinum with subcutaneous emphysema is rarely reported clinical entity. There are several proposed mechanisms for this finding.
- Mostly commonly accepted is due to barotrauma during breathing maneuvers, which occurs due to relative pressure gradient between the alveoli and their vascular structures. An increase in alveolar pressure ultimately leads to rupture of alveoli and alveolar septa, collapse of the adjacent vascular structures and air dissection around the peri bronchial and perivascular sheaths. This phenomenon is called the 'Macklin effect.[1]

It can be due to inspiration against a closed airway (Muller's maneuver) after forced exhalation or exhalation against a closed glottis or airway (Valsalva maneuver). Both are common maneuvers in marijuana users. [2] A direct effect of inhalation marijuana with associated heat can lead to pulmonary damage and pneumothorax but has not been proven. [3] Decision to get esophagogram to rule out esophageal rupture should be individualized. [4]

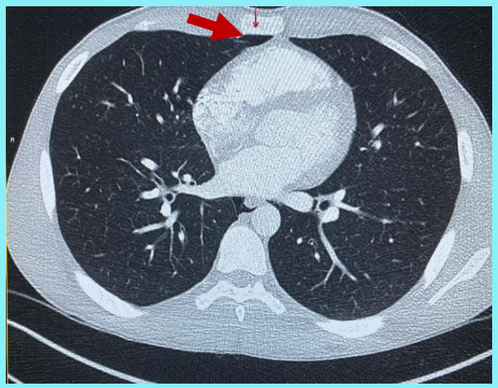

Fig-1 Pneumothorax (Red arrow)

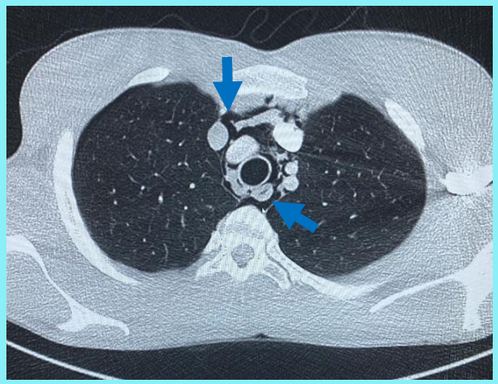

Fig-2 Pneumomediastinum (Blue arrows)

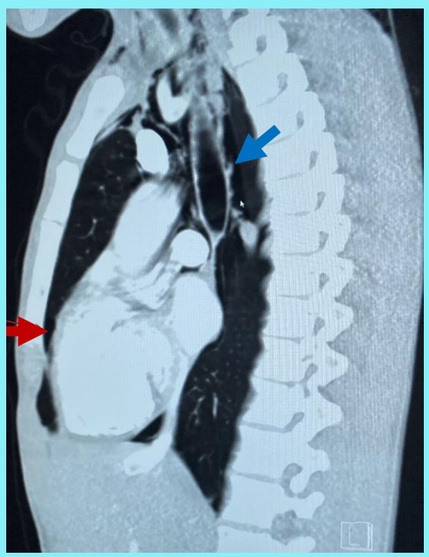

Fig-3 Pneumothorax (Red arrow)
Pneumomediastinum (Blue arrow)

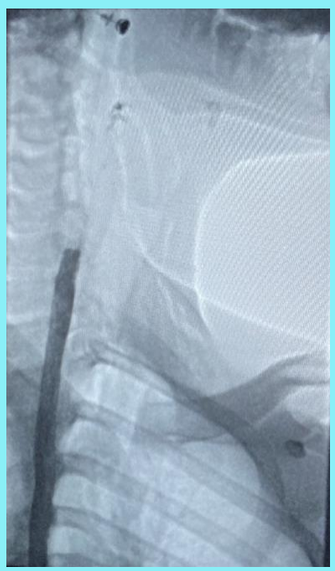

Fig-4 Esophagogram

Conclusion

Cyclic vomiting syndrome (CVS) from cannabinoid use can cause significant barotrauma resulting in pneumothorax and pneumomediastinum. Esophageal rupture is another life threatening complication. If patient is hemodynamically stable, can be observed and no specific treatment is needed. Physicians should be aware of this rare clinical presentation; it could be encountered more often due to approved legislation for medical marijuana use.

REFERENCES

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