**The patient is intubated and ventilated. The high peak inspiratory pressure suddenly alarms. What equipment issues may cause this, and how would you troubleshoot?**

There are several equipment issues that can cause a sudden high peak inspiratory pressure alarm to be triggered.

**Improperly adjusted Airway Pressure Limits**

ventilators have pressure limits that will alert when peak pressures are exceeded because of increased airway resistance in the circuit or in the patient (1).

**Airway resistance in the circuit could be due to:**

- A kink or occlusion in the breathing circuit

- A clogged filter

**Airway resistance in the patient could be due to:**

- decreases in lung or chest wall compliance from

lung: ARDS, pneumothorax.

chest wall: obesity, abdominal distension

The mechanical ventilator can be set to produce a brief pause at end inspiration, allowing the plateau pressure to be measured.

- external obstruction of the endotracheal tube (ETT) (e.g., from a patient biting on the tube or a kink in the tube).

- mucus plug from thick secretions in the ETT

-bronchospasm

- excess tidal volume and inspiratory flow rate (1, 2)

- incorrect ventilator mode or ventilator settings for the patient’s lung compliance

**Figure 1: decreased compliance in the lung or chest wall from bronchospasm on volume control (VC ) and pressure control (PC) modes of ventilation.**

A diagram of a pressure

Description automatically generated with medium confidence

In VC : the set tidal volume is attempted to be delivered with an increase in peak pressures due to decreased lung compliance

In PC: the peak pressure is at a set point on the ventilator so increase in airway resistance results in a decreased tidal volume without a change in the pressure (1)

Patient ventilator asynchrony: bucking the ventilator, breath stacking

**Malfunction of the machine**

**-** malfunction in the gas flow compartments

- leaks or pressure in the scavenging system causing back pressure (3)

**Troubleshooting Tips**

-Measure plateau pressure; if it is < 30 then there is a resistance problem but >30 is indicative of a compliance issue.

-calculate the difference between the peak and plateau pressures, a pressure greater than 5 cm/H20 is likely due to increased resistance.

-check for kinks or occlusion in the circuit or perform an unplanned circuit change

-change a clogged filter

-- ensure to use the most appropriate ventilator mode or ventilator settings for the patient’s lung compliance

-adjust trigger sensitivity

-perform recruitment manoeuvre

-reposition patient

-a patient who is biting on a ETT may need to be sedated, given analgesic, repositioned. Also reposition ETT

-check for kinks in the tube, especially for those patients with an anchorfast.

-suction the patient as needed and assess for any mucus plug

-administer bronchodilators as needed

-reduce tidal volume and modify inspiratory flow rates for that particular patient

-check the gas flow from the high to low pressure compartments to the path of the breathing circuit

-adjust vacuum control valve so that the reservoir bag remains properly inflated, neither overdistended nor completely deflated. Check to see if both valves are functioning.

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