Title: Veress Needle Interface for Tension Pneumothorax Decompression

Invention: Inventors at the University of Arizona have designed an interface for the modified Veress needle (mVN) to address the shortcomings of older devices used to treat tension pneumothorax such as traditional needle thoracostomy (NT). This interface serves as an attachment that adds additional functionality to the standard Veress needle. Equipped with a manual unlock and automatic locking mechanism, this enhancement is durable and includes both a one-way valve to prevent backflow and a flow indicator to monitor whether the device is working properly. In addition, it is compatible with standard Veress needle syringe assemblies and medical kits. Ultimately, it increases ease in using modified Veress needles, which are proven safer and more effective in tension pneumothorax decompression procedures.

Background: In 2013, the article “Modified Veress needle decompression of tension pneumothorax: a randomized crossover animal study”, authored in part by the inventors, was published and thus established the superiority of modified Veress needles over NT for treatment of tension pneumothorax in animals. Standard NTs were found to have inadequate length, small bore diameter, lack of tactile and visual feedback, and low durability relative to the inventors’ mVNs. This interface adds further improvements to the device since the 2013 publication, including identification of optimal needle length and diameter, spring strength, and creation of an airflow indicator.

Applications:

- Tension pneumothorax decompression
- Laparoscopic surgery

Advantages:

- Increases effectiveness in comparison to traditional NT
- Designed specifically to address shortcomings with traditional NT
- Mitigates unintended injuries
- Increases ease when using Veress needles to treat tension pneumothorax
- Secures the blunt canulla in the forward position, preventing damage to the viscera
- Reduces this mean procedure time to 70 seconds – over twice as fast as standard NT
- Includes locking mechanisms and one-way valves to prevent backflow and improve ergonomics
- Includes a flow indicator, which allows the user to know whether the procedure has been successful
Compatible with both liquids and gases, in high and low flow conditions, and interfaces with other Veress needle platforms and medical equipment.

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