

Ujuzi (Practical Pearl/Perle Pratique)

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REGULAR FEATURE

Ujuzi (Practical Pearl/*Perle Pratique*)



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Ujuzi means skills in Swahili and is intended to be a regular feature for colleagues to share practical interventions, innovations and novelties that have proved useful in the management of patients in the prehospital environment or Emergency Centre. You can let Ujuzi know about your practical ideas by emailing practicalpearl@afjem.com.

Improvised endotracheal tube (ETT) cuff manometer for limited resource settings

A manometer is a device that is connected to the pilot cuff of an endotracheal tube (ETT), to measure, inflate or deflate the cuff. It consists of a pressure gauge, a connecting port and mechanisms to inflate or deflate the cuff.¹

The cuff pressure of an adult endotracheal tube should be ideally maintained between 18 and 25 mm Hg to minimise the risk of low pressures in the cuff which cause complications such as aspiration, ventilator associated pneumonia and or high pressure complication mainly pressure necrosis at the tracheal mucosa.²

Inflating an endotracheal tube cuff to the correct pressure using only estimation techniques is not adequate. Using manometry would provide an accurate measurement of safe pressure in an inflated endotracheal tube cuff.^{3,4}

An improvised device, built from consumable medical equipment and components of an aneroid manometer, could be used as an addition to traditional estimation techniques (palpation, pre-determined volume and checking for any cuff leaks) to determine endotracheal tube cuff pressure, if a commercial manometer is not available in limited resource settings.

Description

Components to build the device include an aneroid manometer (from a sphygmomanometer), a small piece of rubber tubing (from the sphygmomanometer), a three-way stopcock and a syringe (10 ml) (Fig. 1).

Attach the rubber tubing to the aneroid manometer and proximal/female port of the three-way stopcock; ensure that the system is free of any leaks between the connecting parts.

Attach the distal/male port of the three-way-stop-cock to the pilot cuff, with all the other ports open. Inflate the pilot cuff with the desired volume of air in the syringe, until the required pressure is reached in the cuff. Close the three-way-stop-cock connection that is attached to the pilot cuff off from the system and remove the device.

Similarly the device can be connected to an already inflated ETT cuff to measure cuff pressure or to inflate or deflate the cuff (Figs. 2 and 3).

It is important to consider that most commercial manometers are calibrated in cmH₂O and aneroid manometers in mm Hg, therefore the numeric value of the safe range pressure would be different as 1 cmH₂O = 0.7 mm Hg.⁵

Pitfalls

The aneroid manometer should be in a good physical condition and calibrated to provide accurate readings. Any leaks in the system (especially between connecting parts) would not allow proper inflation of the cuff and subsequently provide a possible reading.

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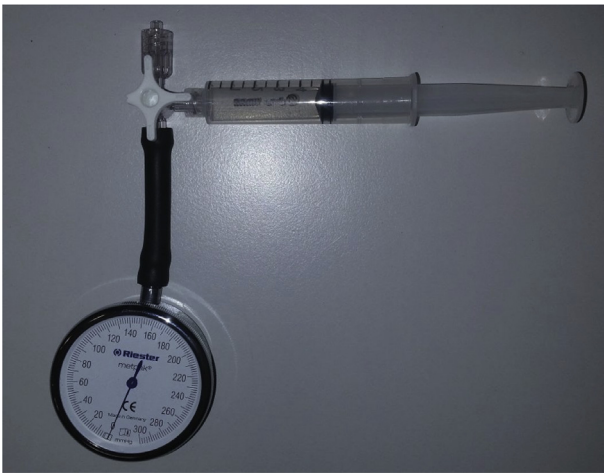


Figure 1 Improved manometer device.

Advantages

The device is neither expensive nor difficult to construct. The consumable components (syringe and stopcock) could be replaced to prevent cross contamination.



Figure 2 Test with ETT: improved device.



Figure 3 Test with ETT: manometer.

Conflict of interest

The author declares no conflict of interest.

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