41934 - Suction Forces Generated by Passive Bile Bag Drainage on a Model of Post-Subdural Hematoma Evacuation

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Disclosures

No relevant disclosures of any author
Introduction

Passive drainage systems are commonly used after subdural hematoma evacuation but there is a dearth of published data regarding the suction forces created. We set out to quantify the suction forces generated by a passive drainage system.
Methods

We created a model of passive drainage after subdural hematoma evacuation. We measured the maximum suction force generated with a bile bag drain for both empty drain tubing and fluid-filled drain tube causing a siphoning effect. We took measurements at varying heights of the bile bag to analyze if bile bag height changed suction forces generated.
A bile bag connected to a rigid, fluid-filled model creates minimal suction force of 0.9 mm Hg (95% CI 0.64 - 1.16 mm Hg). When fluid fills the drain tubing a siphoning effect is created and can generate suction forces ranging from 17.8 to 31.6 mm Hg depending on the relative position of the bile bag and filled amount of the bile bag. The suction forces generated are statistically different if the bile bag is 50 cm below, level with or 50 cm above the experimental model.
Results

Average maximum pressure after 80 cm fall
Results

Average Maximum Suction for Bile Bags of Differing Fill Volumes at Different Heights

- Low
- Mid
- High

Fill Volumes:
- 0 mL
- 50 mL
- 100 mL
- All Volumes

Average Maximum Suction (mm Hg)
Discussion

Passive bile bag drainage does not generate significant suction on a fluid-filled rigid model if the drain tubing is empty. If fluid fills the drain tubing then siphoning occurs and can increase the suction force of a passive bile bag drainage system to levels comparable to partially filled Jackson-Pratt bulb drainage.
Summary Points

• Bile bags used after subdural evacuation can create suction forces

• Suction forces are created from siphoning

• Suction forces from bile bags can be similar to partially filled Jackson-Pratt bulb suction