Device for Treating Bleeding Esophageal Varices

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Technology description

Stabilizes Emergency Patients with Inflating and Deflating Balloon Tamponade

This inflating and deflating balloon tamponade is used to stabilize bleeding esophageal varices in critical patients. Esophageal varices are abnormal, enlarged veins in the esophagus that can leak blood and possibly rupture. They occur most often in people with serious liver diseases and conditions like hepatitis and chronic alcoholism. Twelve million Americans have been infected with Hepatitis B alone and thousands will die from Hepatitis B and its complications, which include bleeding esophageal varices. Variceal bleeding is a medical emergency in which the mortality rate is as high as 20 percent due to failed bleeding management or as a result of early rebleeding. The primary modality for controlling variceal bleeding is endoscopic therapy where variceal band ligation is performed by a gastroenterologist. In situations where band ligation fails to control the variceal bleeding the treating physician will resort to the placement of a tamponade balloon to control the bleeding. Placement of the currently available tamponade balloons can be problematic; these available technologies, must be positioned blindly, making accurate placement challenging. The available balloons have the potential to cause tissue necrosis, esophageal rupture or erosion and airway occlusion if left in place for prolonged periods of time. University of Florida researchers have developed a balloon tamponade that is placed with the endoscope, ensuring proper placement of the balloon and eliminating complications from blind placement. Moreover, University of Florida researchers have developed a cycling balloon feature to their tamponade balloon that reduces the likelihood of tissue necrosis and other complications. This cycling balloon tamponade temporarily stabilizes an active esophageal variceal bleed, yielding additional time to transfer the patient to a tertiary hospital or for the necessary resources to arrive at such a facility. The placement of this easy to use cycling balloon tamponade will limit risk of complications and will increase survival of patients with uncontrolled variceal bleeding.

Technology

The cycling balloon tamponade treats bleeding esophageal varices and stabilizes an otherwise unstable patient either en-route to a tertiary care center or at a time when limited resources are available. The device comprises a bite plate, proximal rubber tube, a distal flexible tube, and inflatable mid-chamber and skirt-chamber balloons. Each balloon chamber connects to adjacent pressure sensors that are

linked to a pressure regulator for proper cycling between balloon inflation and deflation. An endoscope can conveniently pass through the device, and a nasogastric tube can suction gastric contents. Once deflated, the balloon tamponade is easy to remove.

Application area

Cycling balloon tamponade to stabilize bleeding esophageal varices

Advantages

Reduces the risk of pressure necrosis and other complications associated with continuous application of balloon tamponades, allowing for longer periods of use and improved treatment
Connects to a bite plate instead of an uncomfortable helmet and face shield, allowing for proper positioning and longitudinal pressure
Can be inserted with the assistance of an endoscope or nasogastric tube, allowing for easy placement
Allows for direct visualization during insertion, minimizing any potential for complications such as esophageal rupture from inappropriate placement

Institution

University of Florida

Inventors

Shailendra Chauhan
Associate Professor
Giuseppe Morelli
Associate Professor
MEDICINE
Haseeb Jabbar
Alumni

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com