

Flagella Balloon Catheter and Wire

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Technology description

Unmet Need

Balloon catheters are commonly used in open vascular and emergency trauma surgery. Often times, placement of the balloon catheter into the artery or vein is done without imaging guidance because of the use of balloon catheters during emergency surgical procedures. However, successful placement of the balloon catheter is necessary because misplacement of the balloon catheter can cause severe damage to organs and complicate the surgery procedure by incorrectly augmenting the flow of blood. Difficulty is often encountered when the balloon catheter cannot successfully pass through the blood vessel due to minor clots along the walls of the vessel. For victims of torso trauma, when a tamponade is not amenable, a balloon catheter may be used in order to augment the flow of blood to more proximal organs. As a result, blood flow is temporarily blocked to the lower half of the body. During vascular surgery, balloon catheters are also commonly used. One of the most common emergency vascular surgeries, atrial fibrillation-mediated cardio emboli, involves cutting the artery to open the vessel and pass inflatable balloon embolectomy catheters proximally and distally to clear out an occlusion in the vessel. Currently there is need in art that aids in the successful blind maneuvering of balloon catheters during such vascular and torso trauma surgeries.

Technology Overview

Johns Hopkins researchers have designed a modified balloon catheter with an addition of a wire component that has a flexible and backwards bending tip so that light radial force is exerted on the blood vessel wall when placed inside the blood vessel. This wire component, dubbed the flagella, forks into three parts which ensures that the catheter is centered inside of the blood vessel that it is placed into by stabilizing itself against the radial walls of the vessel. This flagella also ensures the smooth, blind passage of the balloon across areas of irregularity within the blood vessel such as blood clots or build up along radial vessel walls to make sure that the catheter is successfully placed and does not pass into side branches of the blood vessel instead. Currently there are no balloon catheter wires on the market that specifically addressing the need for maneuvering catheters without imaging guidance past obstructions or deviations within blood vessels. The proposed balloon catheter design holds significant potential especially for use in emergency surgical procedures.

Institution

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