Clot-Buster Aspiration Catheter for Complex Vascular Navigation and High Volume Clot Removal

Technology #7305

Thrombosis is the formation of a blood clot inside a blood vessel, obstructing the flow of blood through the circulatory system. The formation of a thrombus can occur within the heart or any artery or vein in the body, leading to a myriad of medical problems such as myocardial infarction, stroke, pulmonary embolism and deep venous thrombosis among many others. Although pharmacological “clot-busting” agents are commonly used to dissolve thrombi, surgically performed thrombectomies are required in cases necessitating rapid intervention to protect sensitive organs (e.g. heart or brain), for larger fibrinolytic resistant clots and when systemic delivery of drugs is too risky. Available, thrombectomy devices are based on aspiration catheters or stents/balloons to remove clots. Although these devices have shown to be of value, they have significant limitations such as an inability to navigate complex vascular geometry, difficulty removing large or numerous thrombi and suffer from frequent clogging of the catheter device. To date, a stand-alone device that can rapidly, safely and un-interruptedly remove a large amount of clots effectively in large, medium and small vessels in the same procedure with minimal risk of clot fragmentation and distal embolization, is still missing.

A “clot-busting” aspiration thrombectomy catheter designed for maximum vascular navigation and high volume clot removal

This technology is a clot-busting aspiration catheter device that allows for maximal navigability into small tortuous vessels while maintaining high un-interrupted thrombectomy power to clean up a large clot burden. This device overcomes limitations associated with conventional aspiration catheters by mechanically destroying (‘busting’) clot fragments to prevent catheter clogging and minimize emboli formation. This device includes specifications for optimum power and safety for different types and ages of blood clots and is compatible with the co-delivery of medications, such as fibrinolytic drugs. The compliance and small profile of this catheter enables navigation through complex vascular geometry (e.g. transition from large to small vessels and distal vasculature) making it suitable to remove thrombi from a broad array of intraluminal locations and applicable across a variety of disease situations.

Applications

- Clot-buster aspirator catheter to perform thrombectomies in any arterial or venous territory with intraluminal thrombi
- Deep vein thrombosis
- Pulmonary emboli
- Coronary thrombi
- Thrombosis or atherothrombosis of internal carotid artery, vertebral arteries and cerebral arteries
- Thrombosis or atherothrombosis in below-the-knee peripheral arteries
- The removal of thrombi in other luminal structure (e.g. gastrointestinal or urogenital tract) or in a closed tissue space (e.g. abdominal or thoracic cavity, cerebral ventricles)
Advantages

- Resistance to catheter clogging
- Compatibility with both small and large vessels
- Ability to navigate complex and tapering vascular geometry (i.e. tortuous large/small vessels and transitions from large to small vessels)
- Minimized risk of emboli formation

Inventors

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