IMPLANT DELIVERY APPARATUS AND METHODS WITH ELECTROLYTIC RELEASE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention. The application relates to endoluminal delivery systems and more particularly to electrolytic implant release apparatus.

[0002] Implants such as stents and occlusive coils have been used in patients to treat wide variety of abnormalities and/or diseases such as cardiovascular or neurovascular abnormalities. One of the most common "stenting" procedures is carried out in connection with the treatment of atherosclerosis, a disease which results in a narrowing and stenosis of body lumens, such as the coronary arteries. At the site of the narrowing (i.e., the site of a lesion) a balloon is typically dilated in an angioplasty procedure to open the vessel. A stent is placed within the lumen in order to help maintain an open passageway. The stents typically are bare stent or drug eluting stents.

[0003] There remain challenges in endoluminal stent delivery through tortuous and/or small vasculature and a need to improve stent delivery apparatus and/or systems.

BRIEF SUMMARY OF THE INVENTION

[0004] In one embodiment ~~according to the invention~~, an implant delivery system comprises an elongated delivery guide having a distal end and a proximal end; a self-expanding implant mounted on the elongated delivery guide, the implant having a distal end and a proximal end; a first restraint releasably coupling one of the implant ends to the delivery guide; a second restraint releasably coupling the other of the implant ends to the delivery guide; an electrical conductor adapted to be coupled to a power supply and having an erodible section; and an electrically nonconductive member connecting the first restraint and the electrical conductor. In this manner, the first restraint and first conductor erodible section can be electrically isolated from one another to prevent undesirable shorting between the restraint and stent without using an insulation tube therebetween and advantageously reduce delivery profile.

[0005] In another embodiment ~~according to the invention~~, an implant delivery system comprises an elongated delivery guide having a distal end and a proximal end; a self-expanding implant mounted on the elongated delivery guide, the implant having a distal end and a proximal end; a first restraint releasably coupling one of the implant ends to the delivery guide; a second restraint releasably coupling the other of the implant ends to the delivery guide; an electrical conductor adapted to be coupled to a power supply and having an erodible section; and a member comprising epoxy connecting the first restraint and the electrical conductor.

[0006] In another embodiment ~~according to the invention~~, an implant delivery system comprises an elongated delivery guide having a distal end and a proximal end; a self-expanding implant mounted on the elongated delivery guide, the implant having a distal end and a proximal end; a first restraint releasably coupling one of the implant ends to the delivery guide; a second restraint releasably coupling the other of the implant ends to the delivery guide; an electrical conductor adapted to be coupled to a power supply and having an erodible section; and a connector connecting the first restraint and the electrical conductor wherein the first restraint and the electrical conductor comprise or are formed from different materials.

[0006a] According to an aspect, there is provided an implant delivery system comprising: an elongated delivery guide having a distal end and a proximal end; a self-expanding implant mounted on said elongated delivery guide, said implant having a distal end and a proximal end; a first restraint releasably coupling one of the implant ends to said delivery guide; a second restraint releasably coupling the other of said implant ends to the delivery guide; an electrical conductor adapted to be coupled to a power supply and having an erodible section; and an electrically nonconductive member connecting said first restraint and said electrical conductor wherein said first restraint includes a wrap portion and a coil portion, said wrap portion being wrapped around a portion of said self-expanding implant and said coil portion being coupled to said wrap portion and said electrically nonconductive member, said coil portion having a memory set unexpanded relaxed configuration and an expanded configuration, said coil portion being in said expanded configuration, and wherein when said erodible joint is eroded said coil portion moves toward said unexpanded relaxed configuration coil portion and pulls said wrapped portion to an unwrapped configuration.

[0007] The above is a brief description of some deficiencies in the prior art and advantages of the present invention. Other features, advantages, and embodiments of the invention will be apparent to those skilled in the art from the following description and accompanying drawings, wherein, for purposes of illustration only, specific forms of the invention are set forth in detail.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1A is a perspective view of an implant delivery system according to the invention.

[0009] FIG. 1B is a perspective view of a portion of the system of FIG. 1A.

[0010] FIG. 1C is a schematic view depicting an exemplary embodiment of the electrical hardware of FIG. 3A.

[0011] FIG. 2 diagrammatically illustrates one embodiment of a distal end portion of the delivery guide of FIG. 1A a stent loaded thereon in a radially compressed and twisted configuration.