CLAIMS

What is claimed is:

1. A system for use with a subject, comprising:

a catheter device, comprising:

a tube that has:

a distal opening that is configured to be transluminally advanced into the subject, and

a proximal end that defines a proximal opening, and

an extracorporeal unit that is coupled to the proximal end of the tube; and

a series of anchors;

a series of cartridges arranged along the extracorporeal unit, each of the cartridges:

having an initial position in which the cartridge holds a respective anchor of the series of anchors,

while remaining coupled to the extracorporeal unit, being moveable from the initial position to a deployment position; and

an anchor driver that is configured to, for each of the anchors, sequentially:

engage the anchor, and

while the respective cartridge is in the deployment position, move the anchor out of the respective cartridge, through the proximal opening, and through the tube toward the distal opening.

2. The system according to claim 1, wherein:

the proximal end of the tube defines a tube axis, and

the series of cartridges is arranged in a row that defines a cartridge axis, the cartridge axis being parallel with the tube axis.

3. The system according to claim 1, wherein, for each of the anchors:

the respective cartridge is configured to restrain the anchor therein,

the anchor driver is configured to, while engaged with the anchor, apply a proximal pulling force to the anchor, and

the respective cartridge is configured to, upon the proximal pulling force exceeding a threshold magnitude, responsively undergo a conformational change that allows the anchor driver to move the anchor out of the respective cartridge.

4. The system according to claim 1, wherein, for each of the anchors:

the respective cartridge comprises a first piece and a second piece,

the anchor driver is configured to, while engaged with the anchor, apply a proximal pulling force to the anchor, and

the respective cartridge is configured such that, upon the proximal pulling force exceeding a threshold magnitude, the second piece responsively slides with respect to the first piece in a manner that allows the anchor driver to move the anchor out of the respective cartridge.

5. The system according to claim 1, wherein:

the catheter device further comprises a port at the proximal opening of the tube, and

the system further comprises a flushing adapter:

comprising a fluid fitting, a nozzle, and a channel therebetween, and

reversibly lockable to the extracorporeal unit in a flushing position in which:

the fluid fitting is accessible from outside of the catheter device, and

the nozzle in fluid communication with the port such that fluid driven into the flushing adapter via the fluid fitting is directed distally through the tube.

6. The system according to claim 5, wherein the fluid fitting is a Luer fitting.

7. The system according to claim 5, wherein the port comprises a sealing membrane, the anchor driver configured, for each of the anchors, to advance the anchor distally through the membrane and into the tube.

8. The system according to claim 7, wherein, in the flushing position, the nozzle seals with the port proximally from the membrane.

9. The system according to claim 8, wherein, the port has a tapered inner wall that defines a lumen proximal from the membrane, a lumen of the port tapering distally toward the membrane.

10. The system according to claim 1, wherein each of the cartridges is removable from the extracorporeal unit.

11. The system according to claim 1, wherein the anchor driver is configured to, for each of the anchors, move the anchor out of the respective cartridge, through the proximal opening, and through the tube toward the distal opening while the respective cartridge remains in the deployment position.

12. The system according to claim 1, wherein:

each of the anchors comprises a tissue-engaging element, and a head that comprises an eyelet, and

the system further comprises a tether:

threaded through the eyelet of each of the anchors,

having a proximal portion that includes a proximal end of the tether, and

having a distal portion that includes a distal end of the tether, the distal end of the tether being advanceable distally through the tube into the subject while the proximal end of the tether remains outside of the subject.

13. The system according to claim 12, wherein, for each of the anchors:

the tissue-engaging element defines a central longitudinal axis of the anchor, has a sharpened distal tip, and is configured to be driven into tissue of the subject,

the head is coupled to a proximal end of the tissue-engaging element, and further comprises an interface, configured to be reversibly engaged by the anchor driver, and

the eyelet is mounted so as to be revolvable, with respect to the interface, about the central longitudinal axis of the anchor.

14. The system according to claim 13, wherein the eyelet is mounted so as to be pivotable with respect to the longitudinal axis of the anchor.

15. The system according to claim 14, wherein the eyelet is mounted so as to be pivotable over the interface.

16. The system according to claim 13, wherein the interface is disposed on the central longitudinal axis of the anchor.

17. The system according to claim 13, wherein the tissue-engaging element defines the central longitudinal axis by extending in a helix around and along the central longitudinal axis, and is configured to be screwed into the tissue of the subject.

18. The system according to claim 17, wherein the tissue-engaging element is configured to be screwed into the tissue such that a distal portion of the helix enters the tissue prior to a proximal portion of the helix, the distal portion having a greater pitch than the proximal portion.

19. The system according to claim 13, wherein:

the head comprises a collar that circumscribes the central longitudinal axis, and is rotatably coupled to the interface, and

the eyelet is mounted on the collar and is revolvable around the central longitudinal axis by rotation of the collar about the central longitudinal axis.

20. The system according to claim 12, further comprising a series of tubular spacers, threaded on the tether alternatingly with the anchors.

21. The system according to claim 20, wherein each of the spacers is elastically flexible in deflection.

22. The system according to claim 20, wherein each of the spacers resists axial compression.

23. The system according to claim 20, wherein each of the spacers is defined by a helical wire shaped as a coil.

24. The system according to claim 12, wherein the anchor driver, for each of the anchors, is configured to move the anchor out of the respective cartridge, through the proximal opening, and through the tube toward the distal opening, while the eyelet of the anchor remains threaded on the tether.

25. The system according to claim 12, wherein the catheter device further comprises a tensioner that comprises a spring-loaded winch, coupled to the proximal portion of the tether, and configured to maintain tension on the tether.