

WHAT IS CLAIMED IS:

1. A system for securing a prosthesis at a native valve of a patient's heart, the system comprising:

a delivery catheter, comprising:

a flexible tube comprising a proximal portion having first end, a distal portion having a second end, and a bore extending between the first end and the second end, wherein the distal portion comprises a first flexing section and a second flexing section;

a first pull wire at least partially disposed in the flexible tube;

a second pull wire at least partially disposed in the flexible tube;

wherein actuation of the first pull wire and the second pull wire causes the flexible tube to move from a first configuration to a second configuration;

wherein, when the flexible tube is in the second configuration, the first flexing section forms a first curved portion and the second flexing section forms a curved planar portion; and

an anchoring device and a low-friction sleeve configured to be delivered through the bore and out of the second end of the flexible tube;

wherein the low-friction sleeve includes a lumen through which the anchoring device fits such that the low-friction sleeve fits around all or a portion of the anchoring device;

wherein the anchoring device is configured to secure the prosthesis at the native valve, and wherein the low-friction sleeve is configured to be removable after the anchoring device is in position at the native valve.

2. The system according to claim 1, further comprising a first ring and a second ring, wherein the first ring is disposed at a first actuation point and the first pull wire is attached to the first ring, and wherein the second ring is disposed at a second actuation point and the second pull wire is attached to the second ring.

3. The system according to claim 2, further comprising a third ring, a first spine disposed between the first ring and the second ring, and a second spine disposed between the second ring and the third ring.
4. The system of claim 3, wherein the first spine is configured to restrict compressive movement between the first ring and the second ring when the flexible tube is moved to the second configuration.
5. The system of claim 3, wherein the second spine is configured to restrict bending by the first pull wire between the second ring and the third ring when the flexible tube is moved to the second configuration.
6. The system according to any of claims 3-5, wherein the first flexing section extends between the first ring and the second ring, and wherein the second flexing section extends between the second ring and the third ring.
7. The system according to any of claims 3-6, wherein a ratio of Shore D hardness of the first spine to the Shore D hardness of the second spine is between 1.5:1 and 6: 1.
8. The system according to any of the preceding claims, wherein the flexible tube comprises nitinol.
9. The system according to of claims 2-8, wherein the flexible tube comprises plastic.
10. The system according to any of claims 3 through 7, wherein the first spine and the second spine comprises stainless steel.
11. The system according to any of claims 3 through 7, wherein the first spine and the second spine comprises plastic.

12. The system according to any of the preceding claims, wherein the flexible tube is a solid tube.
13. The system according to any of the preceding claims, wherein when the flexible tube is in the second configuration, the generally curved planar portion of the flexible tube comprises a main portion and a flexible end portion, wherein the flexible end portion is configured to flex to aid in positioning the anchoring device for deployment.
14. The system according to claim 13, wherein the flexible end portion is configured to be angled relative to the main portion of the curved planar portion.
15. The system according to claim 14, wherein a vertical displacement between the flexible end portion and the main portion is between 2 mm and 10 mm.
16. The system according to any of the preceding claims, further comprising a first coiled sleeve that extends around at least a portion of the first pull wire and a second coiled sleeve that extend around at least a portion of the second pull wire.
17. The system according to any of claims 2 through 16, wherein the first actuation point is offset in a circumferential direction from the second actuation point by between 65 degrees and 115 degrees.
18. The system according to any of claims 2 through 17, wherein the first actuation point is offset in a circumferential direction from the second actuation point by about 90 degrees.