damaging the baroreceptor structure and function thereof can decrease the pulmonary artery pressure, which can provide more successful treatments of pulmonary hypertension.

[0004a] In one aspect, there is provided a device for ablating a target tissue of a patient, the device comprising:

a catheter body comprising a proximal end and a terminal distal end;

an elliptical ring coupled to the terminal distal end of the catheter body, the elliptical ring having a major axis and a minor axis, wherein the minor axis divides the elliptical ring into a first portion and a second portion, the first portion encompassing an apex of the major axis; and

a plurality of electrodes supported by the elliptical ring,

wherein the plurality of electrodes comprises a first electrode of a first length, a second electrode of a second length different than the first length, and a third electrode of a third length different than the first length and different than the second length;

wherein a number of electrodes supported by the first portion of the elliptical ring exceeds a number of electrodes supported by the second portion of the elliptical ring.

[0005] Some embodiments disclosed herein provide a multi-pole synchronous pulmonary artery radiofrequency ablation catheter for treatment of pulmonary hypertension in the pulmonary artery by a de-sympathetic method. In some embodiments, the catheter only heats the adherent tissue rather than the blood. Additionally, in some embodiments, the catheter can be configured to provide cold saline perfusion at or near the ablation site to protect the vascular intima. Some embodiments can also provide advantages of simple operation, short operation time and controllable, precise ablation.

[0006] In some embodiments, a multi-pole synchronous pulmonary artery radiofrequency ablation catheter can comprise a control handle, a catheter body and an annular ring. The control handle can be provided with an adjustment apparatus. The catheter body can be hollow and can include a cavity. One or a plurality of lead wires, one or more temperature sensing wires and one or more pull wires can be arranged in the cavity. One end of the catheter body can be flexible. The flexible end can be connected to an annular ring and the other end of the catheter body can be connected to the control handle. One end of the pull wire can be connected to the flexible end and the other end of the pull wire can be connected to the adjustment apparatus. Tension in the pull wire can be adjusted through the adjustment apparatus to achieve shape control, such as curvature control, of the flexible end. A shape memory wire can be arranged in the annular ring. One end of the shape memory wire can

WHAT IS CLAIMED IS:

1. A device for ablating a target tissue of a patient, the device comprising:

a catheter body comprising a proximal end and a terminal distal end;

an elliptical ring coupled to the terminal distal end of the catheter body, the elliptical ring having a major axis and a minor axis, wherein the minor axis divides the elliptical ring into a first portion and a second portion, the first portion encompassing an apex of the major axis; and

a plurality of electrodes supported by the elliptical ring,

wherein the plurality of electrodes comprises a first electrode of a first length, a second electrode of a second length different than the first length, and a third electrode of a third length different than the first length and different than the second length;

wherein a number of electrodes supported by the first portion of the elliptical ring exceeds a number of electrodes supported by the second portion of the elliptical ring.

2. The device according to claim 1, wherein the major axis comprises a first diameter and the minor axis comprises a second diameter, and wherein the first diameter is 5 mm longer than the second diameter.

3. The device according to claim 1, wherein at least one electrode of the plurality of electrodes is disposed over the apex of the major axis.

4. The device according to claim 1, wherein the plurality of electrodes straddle both sides of the apex of the major axis.

5. The device according to claim 1, wherein the distal end of the catheter body is flexible, and wherein the elliptical ring is orthogonal to the distal end.

6. The device according to claim 1, wherein the elliptical ring is planar.

7. The device according to claim 1, wherein the first, second, and third electrodes are substantially coplanar.

8. The device according to claim 1, wherein the elliptical ring comprises a curve of less than 360 degrees and greater than 270 degrees.

9. The device according to claim 1, wherein the first length is about 4 mm, and optionally wherein the second length is at least 3 mm and is less than the first length, and further optionally wherein the third length is at least 2 mm and is less than the second length.

10. The device according to claim 1, wherein the first electrode is separated from the second electrode and the third electrode by an equal distance.

11. The device according to claim 1, wherein the major axis comprises a first diameter having a length from about 25 mm to about 50 mm, and wherein the minor axis comprises a second diameter shorter than the first diameter and having a length of about 20 mm to about 45 mm.

12. The device according to claim 11, wherein the length of the second diameter is about 10% to about 20% shorter than the length of the first diameter.