Claims

1. A one-way limiting expandable artificial heart valve, comprising a valve seat, a valve leaflet stent and three valve leaflets attached to the valve leaflet stent, characterized in that,

the valve seat comprises a one-way limiting expandable annular metal seat, the annular metal seat is composed of three sections of seat body units connected in a staggered overlapping manner from a head end to a tail end of each seat body unit, the head end of each seat body unit is sequentially provided with a first rivet, a limiting protrusion and a first long circular groove, the tail end of each seat body unit is sequentially provided with a second long circular groove matched with the first rivet at the head end of an adjacent seat body unit, a second limiting hole and a first limiting hole matched with the limiting protrusion respectively, and a second rivet matched with the first long circular groove,

the first long circular groove of each seat body unit is matched with the second rivet of the adjacent seat body unit and can move in one direction, the second long circular groove of each seat body unit is matched with the first rivet of the adjacent seat body unit and can move in one direction, the limiting protrusion of each seat body unit is matched with the second limiting hole and the first limiting hole of the adjacent seat body unit respectively and can move in one direction,

the one-way limiting expandable artificial heart valve has an original state of normal use and a one-way limiting expansion state, and each seat body unit forms the one-way limiting expansion state after synchronous one-way rotation and external expansion,

the limiting protrusion is a semicircular protrusion inclined upward along the expansion direction, each of the first limiting hole and the second limiting hole has a shape matched with the limiting protrusion, and the length of the first long circular groove, the length of the second long circular groove and the distance between the two limiting holes are consistent,

the head end of each seat body unit is disposed inside the tail end of the adjacent seat body unit, and the valve seat is made of Elgiloy alloy, cobalt-chromium alloy, nickel-titanium alloy, or implantable stainless steel.

2. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, the seat body unit is formed by two or four or more pieces.

3. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, each seat body unit is configured to be expanded by a balloon having a pressure of no less than 5 atmospheric-pressures to enable the valve seat to synchronously rotate in one direction and expand outwards to form the one-way limiting expansion state, and the original state is an original state of the full-circumference valve annulus structure.

4. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, the specifications of the three valve leaflets are matched with the original state.

5. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, the valve seat further comprises a supporting belt composed of a polymeric material, the supporting belt covers an outer side of the annular metal seat, and the supporting belt is matched with the original state.

6. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, the valve leaflet is modified bovine pericardium, porcine pericardium, porcine aortic valve, flaky animal tissue or non-biosynthetic valve leaflet material.

7. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, a valve portion composed of the three valve leaflets allows one-way blood flow through the valve portion when the valve portion is in the original state.

8. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, after the one-way limiting expandable artificial heart valve is in the one-way limiting expansion state, the one-way limiting expandable artificial heart valve fails in its function in the original state, and an expanded valve seat structure of

the one-way limiting expansion state stably accommodates a new valve that can be intervened through a catheter during an interventional valve-in-valve procedure.

9. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, the valve is an aortic valve, a mitral valve or a tricuspid valve.

10. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, when the valve is an aortic valve, a middle portion of each seat body unit has a wavy protrusion.

11. The one-way limiting expandable artificial heart valve according to claim 1, characterized in that, when the valve is a mitral valve or a tricuspid valve, a middle portion of an upper side of each seat body unit has a protrusion, and a lower side of each seat body unit is flush.