Claims

I claim:

1. An apparatus for anastomosing a cut vessel, the apparatus comprising:

a first ring having an inner surface defining an inner lumen configured to selectively receive a first vessel end of the cut vessel;

a second ring having an inner surface that defines an inner lumen configured to selectively receive a second vessel end of the cut vessel; and

a closure mechanism having a first engagement portion joined to the first ring and a second engagement portion joined to the second ring, a biasing member of the closure mechanism being configured to urge the first and second rings toward one another to anastomose the cut vessel after the first and second vessel ends have been received in the first and second rings.

2. The apparatus of claim 1, wherein the closure mechanism has a closed condition in which the first and second rings are adjacent one another, and an opened condition in which the first and second rings are spaced from one another against the urging of the biasing member.

3. The apparatus of claim 2, wherein the closure mechanism has a first actuating portion connected to the first engagement portion and a second actuating portion connected to the second engagement portion, wherein selective manipulation of at least one of the first and second actuating portions moves the closure mechanism selectively between the closed and opened conditions.

4. A system for anastomosing a cut vessel, the system comprising:

the apparatus of claim 3;

an applicator for selectively engaging the first and second actuating portions of the closure mechanism and selectively manipulating the first and second actuating portions to move the closure mechanism between the opened and closed conditions.

5. The system of claim 4 wherein the applicator has a locking mechanism for selectively locking the applicator in a position in which the closure mechanism is retained in the opened condition.

6. The system of claim 4 or claim 5, wherein the applicator includes

a first handle, a first arm extending from the first handle, and a first jaw at an end of the first handle for selectively engaging the first actuating portion, and

a second handle, a second arm extending from the second handle, and a second jaw at an end of the second handle for selectively engaging the second actuating portion, the first and second handles being selectively manipulable to move the closure mechanism between the opened and closed conditions.

7. The system of claim 6, wherein

the first arm has a first bend adjacent the first handle and a second bend adjacent the first jaw, and

the second arm has a first bend adjacent the second handle and a second bend adjacent the second jaw.

8. The apparatus of any one of the preceding claims, wherein the closure mechanism includes

a first wing having a first base plate, the first engagement portion connected to a first longitudinal end of the first base plate, and a first actuating portion connected to a second longitudinal end of the first base plate,

a second wing having a second base plate, the second engagement portion connected to a first longitudinal end of the second base plate, and a second actuating portion connected to a second longitudinal end of the second base plate, selective manipulation of at least one of the first and second actuating portions moving the closure mechanism selectively between closed and opened conditions.

9. The apparatus of claim 8, wherein

the first engagement portion includes first and second arcuate engagement arms that form a first split ring for selectively receiving the first ring, and

the second engagement portion includes first and second arcuate engagement arms that form a second split ring for selectively receiving the second ring.

10. The apparatus of claim 8 or claim 9, wherein

the first actuating portion includes a substantially flat first gripping surface connected to the second longitudinal end of the first base plate via a first bent portion of the first actuating portion, and

the second actuating portion includes a substantially flat second gripping surface connected to the second longitudinal end of the second base plate via a second bent portion of the second actuating portion.

11. The apparatus of any one or claims 8 to 10, wherein

the first wing includes first and second connection projections extending from a transverse surface of the first base plate, each of the first and second connection projections of the first wing including an opening extending laterally therethrough, and

the second wing includes first and second connection projections extending from a transverse surface of the second base plate, each of the first and second connection projections of the second wing including an opening extending laterally therethrough, and

the closure mechanism includes a fastener that extends through each of the openings to pivotably join the first and second wings together.

12. The apparatus of any one of the preceding claims, wherein the closure mechanism includes

a first wing having the first engagement portion and a first actuating portion, and

a second wing pivotably connected to the first wing, the second wing having the second engagement portion and a second actuating portion, selective manipulation of at least one of the first and second actuating portions pivoting at

least one of the first and second wings relative to the other of the first and second wings.

13. The apparatus of any one of the preceding claims, wherein

the inner surface of the first ring has at least one spike extending away from the inner surface into the inner lumen, the at least one spike of the first ring being configured to extend into a vessel wall of the first vessel end and thereby secure the first ring to the first vessel end, and

the inner surface of the second ring has at least one spike extending away from the inner surface into the inner lumen, the at least one spike of the second ring being configured to extend into a vessel wall of the second vessel end and secure the second ring to the second vessel end.

14. The apparatus of claim 13, wherein the at least one spike of the first ring extends at about a forty-five (45) to about a sixty (60) degree angle with respect to the inner surface of the first ring, and the at least one spike of the second ring extends at about a forty-five (45) to about a sixty (60) degree angle with respect to the inner surface of the second ring.

15. The apparatus of any one of the preceding claims, wherein the first ring surface of the first ring includes at least one post configured to be received in a corresponding receiver depression on the first ring surface of the second ring when the first and second rings are joined together.

16. The apparatus of claim 15, wherein a portion of the at least one post is configured to engage a portion of the corresponding receiver depression to at least partially prevent the at least one post from egressing the corresponding receiver depression.

17. The apparatus of any one of the preceding claims, wherein the biasing member is a spring.