

Claims

- 1 A process for coiling a collagen carrier, the collagen carrier comprising (i) a collagen layer and (ii) a coating layer comprising fibrinogen and thrombin, said
5 process comprising the sequential steps of:
- *humidifying* at least part of said collagen carrier,
 - *coiling* said collagen carrier by gripping the collagen carrier between a pair of elongated members, and rotating the pair of elongated members about an axis being parallel to a longitudinal extension of the elongated members in order to
10 coil the collagen carrier on the members, while the collagen carrier is supported by a support device,
 - *drying* the coiled collagen carrier,
- thereby providing a form-stable coiled collagen carrier.
- 15 2. A process according to claim 1, wherein the coiling is performed by gripping the collagen carrier using at least one pair of tweezers or pincers.
3. A process according to claim 1 or 2, wherein at least the coating layer of said collagen carrier is humidified, and wherein the coating layer has been humidified
20 using a solvent.
4. A process according to claim 3, wherein the solvent comprises or consists of ethanol.
- 25 5. A process according to any of the preceding claims further comprising compressing the collagen carrier to reduce the thickness of the collagen carrier.
6. A process according to any of the preceding claims further comprising arranging the form-stable coiled collagen carrier in a container and subsequently
30 sealing the container.
7. A coiled collagen carrier obtainable by the process of claims 1-6.
8. A coiled collagen carrier obtained by the process of claims 1-7.

9. A coiled collagen carrier
- comprising a collagen layer and a coating layer on top of the collagen layer, the coating layer comprising thrombin and fibrinogen, and
 - having the shape of an elongate element with a number of windings of the collagen carrier about the longitudinal axis of the elongate element and at least the outer winding(s) being orientated so that the coating layer constitutes the outer surface of each of said outer winding(s),
- wherein
- the coiled collagen carrier is form-stable and defines a collagen carrier in a coiled configuration where said outer winding(s) proceed along a spiral in a cross section of the collagen carrier.
10. A coiled collagen carrier according to any one of claims 7-9, wherein the collagen carrier in an unrolled configuration is a rectangular sheet, preferably having a width, a length and a thickness of the most 4 mm, such as at the most 5 mm, preferably at the most 6 mm, such as at the most 7 mm.
11. A coiled collagen carrier according to any one of claims 7-10, comprising three, four or five windings.
12. A coiled collagen carrier according to any one of claims 7-11, wherein the coiled collagen carrier has a cylindrical shape with an outer diameter of less than 12 mm, such as less than 11 mm, such as less than 10 mm, such as less than 9 mm, such as less than 8 mm, such as less than 7 mm, such as less than 6 mm, such as less than 5 mm, such as less than 4 mm, such as less than 3 mm.
13. A coiled collagen carrier according to any one of claims 7-12, wherein the coating layer has no through-going cracks.
14. A packed coiled collagen carrier, comprising a coiled collagen carrier according to any of the claims 7-13 arranged in a container.
15. A method for delivering a coiled collagen carrier according to any one of claims 7-13 to a target location, comprising the step of passing said coiled collagen carrier through an orifice or access tube to the target location.

16. The coiled collagen carrier according to any one of claims 7-15 for use in therapy.
- 5 17. The coiled collagen carrier according to any one of claims 7-15 for use in surgery.
18. The coiled collagen carrier according to any one of claims 7-15 for use in the prevention or treatment of injury associated with performing minimally invasive
10 surgery.
19. The coiled collagen carrier according to any one of claims 7-15 for use in the prevention or treatment of injury associated with performing endoscopic surgery.
- 15 20. The coiled collagen carrier according to any one of claims 7-15 for use in the prevention or treatment of tissue or a tissue sample in need of sealing/glueing.
21. An apparatus for providing a coiled collagen carrier, the apparatus comprising
- a device for applying moisture to a collagen carrier prior to coiling of the
20 collagen carrier,
 - a coiling device comprising
 - rotatable gripping means for gripping the collagen carrier along an edge and coiling the collagen carrier, and
 - a support device supporting the collagen carrier while being coiled.
- 25
22. An apparatus according to claim 21, wherein the gripping device comprises a pair of elongated members, such as a pair of tweezers or pincers.
23. An apparatus according to claim 21 or 22, further comprising a compressing
30 device arranged to compress the moisturised collagen carrier prior to coiling of the moisturised collagen carrier.
24. An apparatus according to any of the claims 21-23, further comprising at least a drying means for drying one or more coiled collagen carriers subsequently to
35 the coiling.

Claims

1. A process for coiling a collagen carrier, the collagen carrier comprising (i) a collagen layer and (ii) a coating layer comprising fibrinogen and thrombin, said process comprising the sequential steps of:
 - humidifying at least part of said collagen carrier,
 - coiling said collagen carrier by gripping the collagen carrier between a pair of elongated members, and rotating the pair of elongated members about an axis being parallel to a longitudinal extension of the elongated members in order to coil the collagen carrier on the members, while the collagen carrier is supported by a support device,
 - drying the coiled collagen carrier,thereby providing a form-stable coiled collagen carrier.
2. A process according to claim 1, wherein the coiling is performed by gripping the collagen carrier using at least one pair of tweezers or pincers.
3. A process according to claim 1 or 2, wherein at least the coating layer of said collagen carrier is humidified; and wherein the coating layer has been humidified using a solvent.
4. A process according to claim 3, wherein the solvent comprises or consists of ethanol.
5. A process according to any of the preceding claims further comprising compressing the collagen carrier to reduce the thickness of the collagen carrier.
6. A process according to any of the preceding claims further comprising arranging the form-stable coiled collagen carrier in a container and subsequently sealing the container.
7. A coiled collagen carrier obtainable by the process of any one of claims 1-6.
8. A coiled collagen carrier obtained by the process of any one of claims 1-7.
9. A coiled collagen carrier
 - comprising a collagen layer and a coating layer on top of the collagen layer, the coating layer comprising thrombin and fibrinogen, and
 - having the shape of an elongate element with a number of windings of the collagen carrier about the longitudinal axis of the elongate element and at least the outer

winding(s) being orientated so that the coating layer constitutes the outer surface of each of said outer winding(s),

wherein

- the coiled collagen carrier is form-stable and defines a collagen carrier in a coiled configuration where said outer winding(s) proceed along a spiral in a cross section of the collagen carrier.
10. A coiled collagen carrier according to any one of claims 7-9, wherein the collagen carrier in an unrolled configuration is a rectangular sheet, preferably having a width, a length and a thickness of the most 4 mm, such as at the most 5 mm, preferably at the most 6 mm, such as at the most 7 mm.
 11. A coiled collagen carrier according to any one of claims 7-10, comprising three, four or five windings.
 12. A coiled collagen carrier according to any one of claims 7-11, wherein the coiled collagen carrier has a cylindrical shape with an outer diameter of less than 12 mm, such as less than 11 mm, such as less than 10 mm, such as less than 9 mm, such as less than 8 mm, such as less than 7 mm, such as less than 6 mm, such as less than 5 mm, such as less than 4 mm, such as less than 3 mm.
 13. A coiled collagen carrier according to any one of claims 7-12, wherein the coating layer has no through-going cracks.
 14. A packed coiled collagen carrier, comprising a coiled collagen carrier according to any of the claims 7-13 arranged in a container.
 15. A method for delivering a coiled collagen carrier according to any one of claims 7-13 to a target location, comprising the step of passing said coiled collagen carrier through an orifice or access tube to the target location.
 16. The coiled collagen carrier according to any one of claims 7-15 for use in therapy.
 17. The coiled collagen carrier according to any one of claims 7-15 for use in surgery.
 18. The coiled collagen carrier according to any one of claims 7-15 for use in the prevention or treatment of injury associated with performing minimally invasive surgery.
 19. The coiled collagen carrier according to any one of claims 7-15 for use in the prevention or treatment of injury associated with performing endoscopic surgery.

20. The coiled collagen carrier according to any one of claims 7-15 for use in the prevention or treatment of tissue or a tissue sample in need of sealing/glueing.
21. An apparatus for providing a coiled collagen carrier, the apparatus comprising
- a device for applying moisture to a collagen carrier prior to coiling of the collagen carrier,
 - a coiling device comprising
 - rotatable gripping means for gripping the collagen carrier along an edge and coiling the collagen carrier, and
 - a support device supporting the collagen carrier while being coiled.
22. An apparatus according to claim 21, wherein the gripping device comprises a pair of elongated members, such as a pair of tweezers or pincers.
23. An apparatus according to claims 21 or 22, further comprising a compressing device arranged to compress the moisturised collagen carrier prior to coiling of the moisturised collagen carrier.
24. An apparatus according to any of the claims 21-23, further comprising at least a drying means for drying one or more coiled collagen carriers subsequently to the coiling.