

## Description

This invention is concerned with a device for pressure encapsulation and tamponading of damaged spleen or kidney.

US-A-3124 136 discloses a knitted surgical non-absorbable mesh for use as a prosthesis in restoration of living tissue.

In accordance with the present invention, a device for pressure encapsulation and tamponading of damaged spleen or kidney is provided, comprising a stretchable, non-heat set knitted absorbable surgical mesh comprising a plurality of filaments, each filament manufactured from a polymer having a glycolic acid ester linkage, said filaments bundled or twisted into a yarn greater than about 6.6 tex (60 denier) and containing up to 4 plies, each ply having greater than about 25 filaments, and said yarn knitted into a mesh.

Although the dimensions and weight of the mesh are only limited by the practical size for its intended use, dimensions of from 10 x 10 cm (4x4 inches) to 25 x 33 cm (10x13 inches) and weights of 21.2 to 184.2 g (0.75 x 6.5 ounces) per 0.836 m<sup>2</sup> (square yard) can be normally used. Openings in the mesh can range normally from zero to 6.35 mm (1/4 inch). The mesh can also be manufactured as a tubular prosthesis.

A drawing which describes the shape and/or geometrical configuration of the mesh or fabric is not necessary for an understanding of this invention. That is, any person skilled in the mesh or fabric art will know how to manufacture and how to use the invention by reading this specification, generally and the examples, specifically.

In order to further stabilize the fabric, that is to eliminate horizontal or vertical edge curling and regulate stretch, the fabric may be heat set by holding both length and width to a specified dimension within a pin or clip frame while exposing the material to temperatures of 90 to 175°C for periods of 30 seconds to 15 minutes, preferably in a vacuum. The fabric may also be heat set by holding both the length and width to a specified dimension on a heated cylinder while exposing the material to temperatures of 90 to 175°C for periods of up to 4 hours in a vacuum.

A knitted surgical mesh has been invented. The mesh comprises a plurality of filaments. Each filament is manufactured from a polymer having a glycolic acid ester linkage. The filaments are bundled or twisted into a yarn, and the yarn is knitted into a mesh.

In one embodiment, the polymer is a homopolymer. In another embodiment, the polymer is a copolymer. In a more specific embodiment, the copolymer is manufactured from glycolide and from trimethylene carbonate.

The yarn manufactured from the homopolymer is greater than about 6.6 tex (60 denier) and contains up to 4 plies. Each ply has greater than about 25 filaments. In a more specific embodiment, the yarn is up to about 16.5 tex (150 denier), and the total number of filaments per yarn is up to about 75.

In another embodiment, the yarn manufactured from the glycolide and trimethylene carbonate copolymer is about 7.215 to 9.44 tex (65 to 85 denier). The yarn contains about 5 to 25 filaments.

## DETAILED DESCRIPTION

The mesh of the invention can be manufactured on a 14 gauge tricot machine, or alternatively on a 28 gauge Raschel warp knit machine using a 2-bar construction. On either of these machines, the mesh is not heat set.

The yarn used in knitting the mesh can be between about 16.6 to 66.6 tex (150 to 600) denier with between 1 and 5 turns per 2.54 cm (inch) of twist. Preferably, the mesh has a lock stitch construction for nonravelling.

The usefulness of this fabric is in the area of soft organ repair, e.g., the spleen, liver or kidney.

An Example of a typical fabric or mesh as contemplated by this invention is given below:

### Example 1

#### 14 Gauge Tricot (14 needles/inch)

This example is a knitted mesh which has been neither stretched nor heat set.

#### A) Stitch design:

Front bar: (2/0 2/4) x 2, (4/6 4/2) x 2

Back Bar: (4/6 4/2) x 2, (2/0 2/4) x 2

#### B) Yarn description:

3 ply 110 den./50 fil. of polyglycolic acid (homopolymer)

#### C) Fabric Weight:

5.0 to 7.5 oz./sq. yd.

#### D) Fabric quality:

16 inches (per 480 courses).

## Claims

1. A device for pressure encapsulation and tamponading of damaged spleen or kidney comprising a stretchable, non-heat set knitted absorbable surgical mesh comprising a plurality of filaments, each filament manufactured from a polymer having a glycolic acid ester linkage, said filaments bundled or twisted into a yarn greater than about 6.6 tex (60 denier) and containing up to 4 plies, each ply having greater than about 25 filaments, and said yarn knit-

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ted into a mesh.

2. A knitted mesh of Claim 1 wherein said polymer is manufactured from glycolide and from trimethylene carbonate.
3. A knitted mesh of Claim 2, wherein said yarn is about 7.215 to 9.4 tex (65 to 85 denier).
4. A knitted mesh of Claim 1 wherein said yarn is up to about 16.5 tex (150 denier), and the total number of filaments per yarn is up to about 75.

#### Patentansprüche

1. Ein Mittel zur Druckeinkapselung und zum Tamponieren beschädigter Milz oder Niere, umfassend eine dehnbare, nicht wärmegehärtete, gewirkte, absorbierbare chirurgische Maschenware, umfassend eine Vielzahl von Fäden, wobei jeder Faden hergestellt ist aus einem Polymer mit einer Glykolsäureester-Bindung, die genannten Fäden zu einem Garn mit mehr als etwa 6,6 Tex (60 Denier) gebündelt oder gezwirnt sind und das Garn bis zu 4 Strähnen enthält, wobei jede Strähne mehr als etwa 25 Fäden aufweist und das Garn zu einer Maschenware gewirkt ist.
2. Eine gewirkte Maschenware nach Anspruch 1, worin das Polymer hergestellt ist aus Glykolid und Trimethylencarbonat.
3. Eine gewirkte Maschenware nach Anspruch 2, worin das genannte Garn etwa 7,215 bis 9,4 Tex (65 bis 85 Denier) hat.
4. Eine gewirkte Maschenware nach Anspruch 1, worin das genannte Garn bis zu etwa 16,5 Tex (150 Denier) hat und die Gesamtzahl der Fäden pro Garn bis zu etwa 75 beträgt.

#### Revendications

1. Dispositif d'encapsulation et de tamponnade sous pression d'une rate ou d'un rein endommagés, comprenant un tricot chirurgical absorbable non thermodurci, étirable, comprenant plusieurs filaments, chaque filament étant fabriqué à partir d'un polymère possédant une liaison ester d'acide glycolique, lesdits filaments étant réunis ou tordus en un fil de plus d'environ 6,6 tex (60 deniers) et contenant jusqu'à 4 brins; chaque brin possédant plus d'environ 25 filaments, et ledit fil étant tricoté en un tricot.
2. Tricot selon la revendication 1, dans lequel ledit polymère est fabriqué à partir de glycolide

de et de carbonate de triméthylène.

3. Tricot selon la revendication 2, dans lequel ledit fil fait d'environ 7,215 à 9,4 tex (65 à 85 deniers).
4. Tricot selon la revendication 1, dans lequel ledit fil fait jusqu'à environ 16,5 tex (150 deniers) et le nombre total de filaments par fil se monte jusqu'à environ 75.

