

Water Pressure (Psi)	Leak Rate (ml/min)	
	Non-coated PTFE Tube	Coated PTFE Tube
2 psi	11.04	3.44
4 psi	19.96	8.3

By way of comparison, normal blood pressures within the human body typically range from 1.8 to 2.3 psi. Thus, the formation of the polyurethane coating upon the PTFE tube significantly reduces the suture hole leakage rate.

The aforementioned laboratory simulation was also used to compare suture retention strength of such non-porous coated PTFE vascular grafts to conventional uncoated PTFE vascular grafts. Both axial suture retention strength and radial suture retention strength were tested. Axial suture retention strength was tested by sewing a 6-0 polypropylene suture through the wall of the graft two millimeters from the end and applying a load to the suture along the longitudinal axis of the tubular graft. Peak loads at failure of the graft or breaking of the suture itself were noted. Radial suture retention strength was tested by first slitting the tubular test segment, opening the test segment to form a relatively flat sheet, sewing 6-0 polypropylene suture into the test segment, and applying a load to the suture in a direction perpendicular to what would have been the longitudinal axis of the tubular graft before it was slit open. Again, peak loads at failure of the graft or breaking of the suture itself were noted. The results of this comparison are set forth below:

	Axial and Radial Suture Retention Strength	
	Non-coated PTFE Tube	Coated PTFE Tube
Axial suture retention strength (grams)	321.4 ± 63.4	747.1 ± 169.3
Radial suture retention strength (grams)	782.2 ± 74.3	743.9 ± 80.3

Thus, the polyurethane coating significantly increases axial suture retention strength without adversely impacting upon radial suture retention strength.

The aforementioned laboratory simulation also included a comparative investigation of the respective water entry pressures for the uncoated and coated PTFE test segments described above. Water entry pressure is a test of the pressure at which water applied to the inner passageway of the graft leaks through the outer porous wall of the PTFE tube, and thereby serves as a measure of the tendency for such a vascular graft to exhibit serous weepage when implanted in the body. The respective water entry pressures noted for the test segments described above are as follows.

	Water Entry Pressure	
	Non-coated PTFE Tube	Coated PTFE Tube
Water entry pressure (psi)	7.4 ± 0.76	>15 psi

Thus, the polyurethane coating significantly increases water entry pressure and lessens the tendency of a graft to exhibit serous weepage.

Those skilled in the art will now appreciate that an improved PTFE vascular graft has been described which has a cylindrical outer wall that is non-porous over at least a portion of its length and which may be

used wherever prosthetic vascular grafts are currently used today, including various applications in both peripheral vascular and vascular access uses. The above-described graft may be implanted in the same manner as is currently used to implant porous PTFE vascular grafts. Moreover, the elastomeric coating minimizes suture hole bleeding at the time of implantation, increases suture retention strength, reduces serous weepage, and selectively precludes tissue ingrowth at the coated sections. While the invention has been described with reference to preferred embodiments thereof, the description is for illustrative purposes only and is not to be construed as limiting the scope of the invention. Various modifications and changes may be made by those skilled in the art without departing from the true spirit and scope of the invention as defined by the appended claims.

We claim:

1. An implantable vascular graft comprising:
 - a. an expanded, porous PTFE tube having inner and outer cylindrical walls; and
 - b. a non-porous coating of a non-porous elastomer applied over at least a portion of the outer cylindrical wall of said PTFE tube, said coating having a substantially uniform thickness.
2. The implantable vascular graft recited by claim 1 wherein said non-porous elastomer coating is a coating of non-porous polyurethane.
3. The implantable vascular graft recited by claim 1 wherein said elastomer is selected from the group of elastomers consisting of medical-grade silicone rubber elastomers, segmented polyurethanes, polyurethane-ureas, and silicone-polyurethane copolymers.
4. An implantable vascular graft comprising:
 - a. an expanded, porous PTFE tube having inner and outer cylindrical walls, and having first and second opposing end portions and a central portion lying between said first and second opposing end portions; and
 - b. a non-porous coating of a non-porous elastomer applied over the outer cylindrical wall of said PTFE tube along said first and second opposing end portions but not along the central portion of said PTFE tube.
5. The implantable vascular graft recited by claim 4 wherein said non-porous elastomer coating is a coating of non-porous polyurethane.
6. The implantable vascular graft recited by claim 4 wherein said elastomer is selected from the group of elastomers consisting of medical-grade silicone rubber elastomers, segmented polyurethanes, polyurethane-ureas, and silicone-polyurethane copolymers.
7. An implantable vascular graft comprising:
 - a. an expanded, porous PTFE tube having inner and outer cylindrical walls;
 - b. a non-porous coating of a non-porous elastomer applied over at least a portion of the outer cylindrical wall of said PTFE tube but not to the inner cylindrical wall of said PTFE tube, said coating having a substantially uniform thickness; and
 - c. the inner cylindrical wall of said PTFE tube being uncoated and porous.
8. The implantable vascular graft recited by claim 7 wherein said non-porous elastomer coating is a coating of non-porous polyurethane.
9. The implantable vascular graft recited by claim 7 wherein said elastomer is selected from the group of elastomers consisting of medical-grade silicone rubber elastomers, segmented polyurethanes, polyurethane-ureas, and silicone-polyurethane copolymers.

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