

# Long Term Results of Arterial Revascularization with Omniflow II® Biosynthetic Grafts: A Single Center Experience

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## Abstract

**Aim:** The aim of this study is to analyze the long-term outcomes of above-knee femoro-popliteal bypass procedures with Omniflow® II biosynthetic grafts. Primary patency and graft related complications were the end points of the study.

**Methods:** Between January 2012 and January 2021, a total of 50 patients (42 males, 8 females) were revascularized using an in-situ Omniflow® II graft. Demographic, clinical, operative and postoperative characteristics of the patients were analyzed retrospectively.

**Results:** Mean age was  $63.8 \pm 10.1$  (range 40-82) years. Fifty above-knee femoropopliteal bypass procedures were performed. Four patients (8%) were operated on due to a previous vascular graft infection where 8 (16%) were operated on due to a previous occlusion. Primary patency rate was 88%. Early graft thrombosis occurred in 2 (4%) patients where late graft stenosis unrelated to the anastomotic sites was encountered in 1 (2%) patient. An endarterectomy on either the proximal or distal site of the anastomosis were performed in 12 (24%) patients. Mean follow-up was  $32.9 \pm 20.8$  (range 12-90) months. Three (6%) patients died due to a COVID-19 infection. No graft infection nor mortality related to arterial bypass procedures was encountered.

**Conclusion:** The Omniflow® II biosynthetic graft provides superior results in treatment of above-knee femoro-popliteal bypass procedures with high patency rates and low incidence of graft infection and aneurysm formation.

**Keywords:** Biosynthetic graft, vascular grafting, revascularization, peripheral arterial disease

## 1. Introduction

Patients with peripheral arterial disease (PAD) have a poor circulation due to decreased arterial perfusion. The arterial blood flow to the distal extremity is restricted most frequently by systemic atherosclerosis. Its prevalence is 3-10% between 40-59 years and 15-20% over 70 years<sup>1</sup>. The most significant risk factors for PAD are diabetes mellitus (DM), hypertension (HT), hyperlipidemia (HL), chronic kidney disease (CKD), and smoking<sup>2</sup>. In addition, there is an increased rate of myocardial infarction, ischemic stroke, and cardiovascular death in patients with PAD<sup>3</sup>.

There is a remarkable elevated risk of adverse limb events like ischemic ulceration and gangrene unless treated. Revascularization deemed mandatory, particularly in patients with more advanced symptoms and presentations. Duplex ultrasonography, computed tomography angiography (CTA), magnetic resonance angiography or conventional peripheral angiography should be performed to diagnose and define the anatomy before revascularization. Though endovascular approaches have extended the invasive treatment modalities in peripheral arterial occlusive disease, surgical interventions must be considered especially for long occlusive disease, aneurysm formation, vascular graft infection and failure of endovascular treatment.

Despite the fact that superiority of the autogenous grafts are well-known, prosthetic grafts should be the selected conduit type in a variety of patients especially when autogenous grafts are not accessible, available or suitable<sup>4</sup>. Since 1983, the Omniflow® vascular grafts have been in clinical practice and advances in technology throughout this time period led to the current Omniflow® II vascular graft (OVG)<sup>5-7</sup>. Omniflow® II (Bio Nova International, Victoria, Australia) is created by using cross linked ovine collagen and an endoskeleton made of polyester mesh which

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# Long Term Results Of Arterial Interventions

**Mauro Moscucci**



## **Long Term Results Of Arterial Interventions:**

Peripheral Arterial Interventions Nicolas W. Shammas, 2022-10-13 This book examines new technologies device and pharmacologic that have evolved over the past few years in treating peripheral arterial disease Chapters offer optimal strategies to treat PAD supported by peer reviewed data The pillars of this strategy will focus on a changing vessel compliance to allow better lumen expansion b less recoil and dissections and c less bailout stenting Chapters also review embolic protection devices and apply the adjunctive use of anti proliferative therapy to maintain good long term outcomes In addition the book reviews drug coated balloons and drug eluting stent technologies and other means of drug delivery into the vessel wall The goal of this book is to discuss all these emerging technologies under the strategy of treating patients with the focus on both acute and long term outcomes Featuring world renown experts this book offers a critical and comprehensive overview of the current data and future directions that would pave the way for optimal PAD management Peripheral Arterial Interventions is an essential resource for physicians residents fellows and medical students in cardiology radiology vascular surgery primary care and health promotion and disease prevention as well as internal and vascular medicine specialists

**Long-Term Results of Arterial Interventions** Alain Branchereau, MD, Michael Jacobs, MD, 1997-10-07 This volume is particularly valuable as a current standard reference It covers all the major vascular operations carotid endarterectomy aortoiliac reconstructions and infrainguinal bypasses in situ and reversed vein Dacron and PTFE prosthetic thoracic and abdominal bypasses matching each to its competing endovascular procedure In addition it provides excellent long term data on such less common procedures as internal carotid bypass vertebral artery revascularization adjunctive procedures to enhance the patency of infrainguinal prosthetic bypass and percutaneous intentional extraluminal revascularization Finally this framework is reinforced by in depth chapters on current non interventional management surveillance programs to enhance long term patency and the ultimate challenge for all practicing vascular surgeons the management of infected aortic grafts Such clear comprehensive and current analysis should be of considerable and on going value both by helping vascular surgeons to make more effective decisions and to more knowledgeably discuss functional results complication risks life expectancy and surgical outcome issues with the patient and family      *Cardiovascular Interventions in Clinical Practice* Jürgen Haase, Hans-Joachim Schäfers, Horst Sievert, Ron Waksman, 2010-04-01 Until the publication of this exciting volume new treatment modalities in the rapidly growing field of interventional cardiology were described based on individual research findings Now a multidisciplinary team of international experts puts catheter based treatment techniques in context by exploring the pathobiology of specific diseases alongside a discussion of imaging tools and functional tests and a comparison to alternative treatment approaches provided by cardiovascular surgery This comprehensive overview of interventional cardiology represents a landmark in the field      *Peripheral Endovascular Interventions* Thomas J. Fogarty, Rodney A. White, 2010-06-25 This book offers a comprehensive review of the rapidly advancing field of endovascular

therapy written by internationally recognized authorities in the field many of whom are the innovators of the techniques and devices involved Broad in scope topics covered range from how to obtain training in approved endovascular techniques to promising new lines of investigational therapies

**Cardiovascular Catheterization and Intervention** Debabrata Mukherjee, Eric Bates, Marco Roffi, David Moliterno, 2010-08-24 The field of invasive and interventional cardiology is dynamic with frequent advances in both technique and technology An internationally renowned team of editors and over 100 contributors have shaped this textbook to provide clinicians with a thorough guide that covers the procedural and periprocedural aspects of coronary peripheral and structural heart disease diagnostics and interventions This comprehensive and highly illustrated textbook presents critical information for anyone active in the field of cardiovascular interventions including Practical suggestions on how to set up a cardiovascular catheterization laboratory choose the right equipment and minimize radiation exposure A careful analysis of the general principles of percutaneous coronary interventions the specific knowledge needed in different clinical scenarios as well as the patient selection criteria for each invasive procedure In depth coverage of non coronary interventions including 13 chapters on peripheral vascular interventions including carotid artery stenting as well as newer procedures for intracranial stenosis treatment septal defect repair and left atrial appendage closure An incorporation of emerging procedures in structural heart disease such as percutaneous aortic valve replacement and mitral valve repair that although not presently mainstream will likely become an important domain of interventional cardiologists Given the importance of appropriate training and credentialing for clinicians the textbook also includes current national guidelines and policies on the performance of the various procedures

**Image-Guided Interventions E-Book** Matthew A. Mauro, Kieran P.J. Murphy, Kenneth R. Thomson, Anthony C. Venbrux, Robert A. Morgan, 2013-09-09 2014 BMA Medical Book Awards Highly Commended in Radiology category Image Guided Interventions a title in the Expert Radiology Series brings you in depth and advanced guidance on all of today's imaging and procedural techniques Whether you are a seasoned interventionalist or trainee this single volume medical reference book offers the up to the minute therapeutic methods necessary to help you formulate the best treatment strategies for your patients The combined knowledge of radiology experts from around the globe provides a broad range of treatment options and perspectives equipping you to avoid complications and put today's best approaches to work in your practice the authors and editors have succeeded in providing a book that is both useful instructive and practical Reviewed by RAD Magazine March 2015 Formulate the best treatment plans for your patients with step by step instructions on important therapeutic radiology techniques as well as discussions on equipment contrast agents pharmacologic agents antiplatelet agents and protocols Make effective clinical decisions with the help of detailed protocols classic signs algorithms and SIR guidelines Make optimal use of the latest interventional radiology techniques with new chapters covering ablation involving microwave and irreversible electroporation aortic endografts with fenestrated grafts and branch fenestrations thoracic endografting TEVAR catheter

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**Guide to Peripheral and Cerebrovascular Intervention** Deepak L. Bhatt, 2004 Provides a highly illustrated technical overview of endovascular procedures Each chapter contains an overview of a specific area supplemented by tables line diagrams and angiograms

*Complications in Peripheral Vascular Interventions* Martin Schillinger, Erich Minar, 2007-05-31 Increasing evidence suggests that particularly in high risk patients endovascular solutions offer substantial advantages compared to vascular surgical procedures Nevertheless growing numbers of procedures are associated with an increased incidence of complications Knowledge of specific complications in different vessel areas will support the interventionist in preventing such adverse events and if necessary provide considerable reassurance if such complications need to be resolved In *Complications in Peripheral Vascular Interventions* typical and atypical complications are described for all peripheral vessel areas and methods for how to handle these events are outlined The book is divided in two parts Part 1 reviews general aspects on complications in peripheral interventions and Part II covers the specific vessel areas Each chapter on the specific vessel area includes Introduction to the frequency and kind of complications in this vessel area Factors identifying high risk patients for these complications Complications of specific interventional steps and tools Endovascular techniques to resolve these complications Methods to avoid complications Summary Checklist for emergency equipment Offering practical tips for the interventionist in the cath lab high volume interventionists share their experiences by reviewing complicated cases and outlining different strategies used in real life scenarios

**Manual of Peripheral Vascular Intervention** Ivan P. Casserly, Ravish Sachar, Jay S. Yadav, 2005 This manual is a practical how to guide to vascular interventional procedures for all arteries and veins outside the coronary vascular system The book provides the information needed to evaluate patients and perform procedures and describes the actual techniques used by experienced practitioners including anticoagulants antithrombotics wires guides angioplasty and stents More than 400 illustrations complement the text Chapters on each artery cover indications for interventional procedures vascular anatomy access diagnostic angiography and specific interventional techniques Complications and risks of restenosis are also discussed The book also includes a chapter on training and credentialing in peripheral vascular intervention

Cardio-Nephrology Janani Rangaswami, Edgar V. Lerma, Claudio Ronco, 2017-07-31 Extending from the outpatient management of cardiovascular and kidney disease to hospital based decision making in patients with cardio renal disease and complex interfaces such as hemodialysis in patients

with ventricular assist device support this book serves as a single reference point for cardiology and nephrology clinicians and researchers dealing with the significant overlap areas between these two specialties Chapters cover the physiology biomarkers therapeutic agents and full spectrum of these comorbidities and feature separate sections on cardiovascular and CKD evaluations stratification of kidney transplant patients lipid management in CKD interventional strategies and hypertension Leaders in cardiology nephrology hypertension and lipidology bring together the latest evidence with their collective clinical experience into this invaluable resource This textbook is an essential resource for physicians and allied professionals practicing cardiology nephrology students and physician trainees to deepen their understanding of this crucial field

**Cardiovascular Intervention E-Book** Deepak L. Bhatt, 2023-09-08 Selected for 2025 Doody's Core Titles in Cardiology Part of the renowned Braunwald family of references Cardiovascular Intervention A Companion to Braunwald's Heart Disease provides today's clinicians with clear authoritative guidance on every aspect of catheterization of the heart and vasculature and the latest imaging technologies This practical reference on interventional cardiology is organized from a procedural perspective with chapters focused exclusively on how to manage complex cardiovascular disease Now fully updated from cover to cover the 2nd Edition offers authoritative and current point of care coverage of this highly complex technology driven specialty an ideal resource for practitioners at all levels of experience Offers concise focused coverage of all aspects of managing interventional cardiology patients highlighting cautions procedural nuances and tips and outcomes Covers all the newest catheterization techniques and equipment including new generation stents mechanical support devices imaging technology and closure devices Offers complete coverage of structural heart disease and new developments in heart valve disease including TAVI and mitral valve procedures Provides updates on the latest procedures devices and clinical guidelines for evidence based practice Uses a clear easy to follow organization with separate sections on coronary artery interventions peripheral artery interventions cerebrovascular interventions venous interventions structural heart interventions and congenital heart disease Features more than 506 high quality illustrations and access to 176 procedural videos Any additional digital ancillary content may publish up to 6 weeks following the publication date

**Complications of Cardiovascular Procedures** Mauro Moscucci, 2012-03-28 This textbook provides interventional cardiologists endovascular interventionalists and physicians in training with a comprehensive resource on the prevention and management of complications in interventional cardiology The book focuses specifically on risk factors prevention and management with conventional and or with bailout techniques and devices It includes many images of common and rare complications and of devices The first section on general principles includes quality assurance training requirements legal considerations adjunctive pharmacotherapy and conscious sedation Subsequent sections cover general complications of invasive procedures and complications of specific coronary interventions noncoronary cardiac interventions peripheral vascular procedures pediatric interventions and electrophysiology procedures A companion website includes videos of over 30 complications and

bailout techniques      **Grossman & Baim's Cardiac Catheterization, Angiography, and Intervention** Mauro Moscucci, 2020-09-10 The leading comprehensive reference on cardiac catheterization through eight outstanding editions Grossman Baim's Cardiac Catheterization Angiography and Intervention Ninth Edition continues to keep you up to date with every facet of this fast changing field Designed for quick access and easy reference this text offers expert overviews of the theoretical and practical aspects of clinical issues with emphasis given to hemodynamic data and tracings and interventional procedures An impressive multimedia library with new videos and cases make this reference even more valuable for cardiologists and interventional cardiologists at all levels of experience      *Strategic Approaches in Coronary Intervention* Stephen Geoffrey Ellis, David R. Holmes, 2006 Updated to include the newest devices and procedures this practical reference is a clinically oriented guide to interventional cardiology Chapters by the foremost experts present step by step approaches to specific clinical problems and offer guidelines for selecting the most appropriate device and technique The authors recommendations are backed by their extensive experience and by evidence based clinical trials This Third Edition describes the latest stents and stenting procedures including local drug delivery with coated stents and provides state of the art information on local myocyte injection distal protection devices peripheral vascular intervention and new adjunctive therapies The concluding chapter previews future developments in the field      **Advanced Therapy in Hypertension and Vascular Disease** Emile R. Mohler (III.), 2006 Provides a resource for health care professionals who evaluate and manage patients with hypertension Topics include hypertension in adolescents treatment of hypertension in athletes hypertension and weight loss salt and dietary change to control blood pressure and more      **Index Medicus**, 2004 Vols for 1963 include as pt 2 of the Jan issue Medical subject headings      **Textbook of Interventional Cardiology E-Book** Eric J. Topol, Paul S. Teirstein, 2015-08-21 Ideal for cardiologists surgeons and referring physicians who need a clinical guide to interventional procedures Textbook of Interventional Cardiology focuses on the latest treatment protocols for managing heart disorders at every level of complexity In this updated edition Dr Topol continues to bring together experts in the field who present the current state of knowledge and clinical practice in interventional cardiology including cutting edge theories trends and applications of diagnostic and interventional cardiology as well as peripheral vascular techniques and practices Offers an in depth understanding of cardiology making it well suited for cardiology and interventional cardiology exam preparation Expert guidance from leading authorities ensures a fresh and balanced perspective on every aspect of interventional cardiology Presents the most recent genetic information and clinical trials related to interventional cardiology Highlights the latest treatment advances procedures devices and techniques including transcatheter aortic valve implantation TAVI Brand new chapters include Radiation Safety Renal Denervation for Resistant Hypertension Post PCI Hospitalization Length of Stay and Discharge Planning and Interventional Heart Failure Offers balanced coverage of the entire scope of technologies available without favoring one particular device over another Integrates the latest trial data into discussions on clinical

practice and recommendations Multiple images of devices and intra procedural imaging enhance your visual understanding of the material Key Points boxes at the beginning of each chapter summarize the most important facts

**Textbook of Interventional Cardiology** Eric J. Topol, MD, Paul S. Teirstein, MD, 2015-09-30 Ideal for cardiologists surgeons and referring physicians who need a clinical guide to interventional procedures Textbook of Interventional Cardiology focuses on the latest treatment protocols for managing heart disorders at every level of complexity In this updated edition Dr Topol continues to bring together experts in the field who present the current state of knowledge and clinical practice in interventional cardiology including cutting edge theories trends and applications of diagnostic and interventional cardiology as well as peripheral vascular techniques and practices Offers an in depth understanding of cardiology making it well suited for cardiology and interventional cardiology exam preparation Expert guidance from leading authorities ensures a fresh and balanced perspective on every aspect of interventional cardiology Presents the most recent genetic information and clinical trials related to interventional cardiology Highlights the latest treatment advances procedures devices and techniques including transcatheter aortic valve implantation TAVI Brand new chapters include Radiation Safety Renal Denervation for Resistant Hypertension Post PCI Hospitalization Length of Stay and Discharge Planning and Interventional Heart Failure Offers balanced coverage of the entire scope of technologies available without favoring one particular device over another Integrates the latest trial data into discussions on clinical practice and recommendations Multiple images of devices and intra procedural imaging enhance your visual understanding of the material Key Points boxes at the beginning of each chapter summarize the most important facts Features 45 videos easily accessible via Expert Consult Expert Consult eBook version included with purchase This enhanced eBook experience offers access to all of the text figures videos and references from the book on a variety of devices

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*Vascular Interventional Radiology* Mark G. Cowling, 2006-12-26 This volume focusses on the current evidence surrounding the use of endovascular therapy It updates and complements the earlier Medical Radiology volume on the Radiology of Peripheral Vascular Diseases Some background information is provided on vascular biology and the facilities



required for safe endovascular practice along with guidance on consent issues Further chapters deal with endovascular treatment in particular arterial territories and include the evidence in favour of or against the use of specific treatments The most up to date evidence surrounding endovascular aneurysm repair is discussed There are also chapters on venous interventions including the endovascular management of varicose veins This book will be of value both to interventional radiologists and to vascular surgeons with an interest in endovascular techniques

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