

Ian D. Learmonth (Ed.)

# Interfaces in Total Hip Arthroplasty



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# Interfaces In Total Hip Arthroplasty

**Jianjun Gao**



## **Interfaces In Total Hip Arthroplasty:**

**Interfaces in Total Hip Arthroplasty** Ian D. Learmouth, 2000 Total hip arthroplasty is carried out to relieve pain and restore function and the implant should outlast the patient. However, failure at one of the interfaces represents the commonest cause of failure of total hip replacement. The durability of the fixation interfaces and the articular interface are therefore critical in determining the long term performance of the implant. This book accesses the opinions of a number of experts in their field on the important issues and factors influencing the component cement and bone cement interface that contribute to durability of fixation in these areas. In addition, they explore how this fixation can be influenced both by the design of the implant, the material properties and the cement. The various material combinations that are available at the articular interface are also presented and the wear properties of and generation of debris from the interfaces are revealed.

**Interfaces in Total Hip Arthroplasty** Ian D. Learmonth, 2011-11-08 This book incorporates the experience of numerous experts who explore contemporary opinion of how best to rationalise and optimise the interfaces at total hip replacement to provide the most favourable and durable results. The survival of a total hip replacement depends principally on the enduring integrity of the fixation interfaces and of the articular interface. The design of the stem and the material properties of cement largely determine the state of the component cement interface while the bone cement interface is significantly influenced by both mechanical and biological factors. The surface finish and shape of cementless implants are designed to preserve the integrity of biological fixation (osseointegration) at the bone component interface. Once again, both mechanical and biological factors have to be considered while bioactive coatings accelerate bone ongrowth. Metal on polyethylene is the most widely used articular interface. However, it has been suggested that wear of polyethylene is one of the major factors contributing to failure of total hip replacements. The increasing prevalence of total hip replacement in younger patients has stimulated the investigation of alternative more durable couples including ceramic/polyethylene, ceramic/ceramic and metal on metal. Modularity provides greater intra-operative flexibility but each new modular interface introduces new mechanisms of failure. These need to be anticipated and appropriate measures taken to avoid them. Hopefully, this book will provide a better understanding of the factors that contribute to stable interfaces and long term survival of total hip arthroplasty.

**Interfaces in Total Hip Arthroplasty** Ian D. Learmonth, 2012-12-06 This book incorporates the experience of numerous experts who explore contemporary opinion of how best to rationalise and optimise the interfaces at total hip replacement to provide the most favourable and durable results. The survival of a total hip replacement depends principally on the enduring integrity of the fixation interfaces and of the articular interface. The design of the stem and the material properties of cement largely determine the state of the component cement interface while the bone cement interface is significantly influenced by both mechanical and biological factors. The surface finish and shape of cementless implants are designed to preserve the integrity of biological fixation (osseointegration) at the bone component interface. Once again, both mechanical and biological

factors have to be considered while bioactive coatings accelerate bone ongrowth Metal on polyethylene is the most widely used articular interface However it has been suggested that wear of polyethylene is one of the major factors contributing to failure of total hip replacements The increasing prevalence of total hip replacement in younger patients has stimulated the investigation of alternative more durable couples including ceramic polyethylene ceramic ceramic and metal on metal Modularity provides greater intra operative flexibility but each new modular interface introduces new mechanisms of failure These need to be anticipated and appropriate measures taken to avoid them Hopefully this book will provide a better understanding of the factors that contribute to stable interfaces and long term survival of total hip arthroplasty The Well-Cemented Total Hip Arthroplasty Steffen Breusch, Henrik Malchau, 2006-02-08 Cemented Total Hip Arthroplasty THA remains one of the most successful procedures in Orthopaedic surgery It has become very clear that it is the surgical expertise in particular the quality of the cementing technique which will affect long term outcome and success It is the intention of this book to provide an up to date comprehensive assessment of the entire field of cemented THA Special emphasis has been given to practice relevant aspects well illustrated and detailed operative steps as a practical guideline a basic science chapter and long term outcome data are provided Minimally invasive surgery modern perioperative management and patient fast tracking are covered A number of highly respected experts have contributed to this in depth compilation of the state of the art in 2005 This book is written and intended for both trainees and established arthroplasty surgeons who are dedicated to perform a well cemented THA **Bone-Implant Interface in Orthopedic Surgery**

Theofilos Karachalios, 2013-11-19 Total joint arthroplasty is an effective surgical procedure for end stage osteoarthritis of major joints with satisfactory long term clinical outcome A large and growing number of arthroplasties are performed annually worldwide and a great number of orthopaedic surgeons are practicing arthroplasty surgery as their main surgical activity The biological behavior of the bone implant interface is crucial for the long term survival of the artificial joint All factors which have a positive or negative effect on the interface are of great interest for those practicing arthroplasty surgery Basic scientists and the industry are continuously searching for new implant fixation mechanisms and improved materials There is an accumulation of a great amount of basic science data both biological material and mechanical related to the incorporation or loosening of the bone implant interface However basic science data does not always translate to satisfactory clinical application and orthopaedic practitioners often wonder which piece of information is clinically useful A further problem is that basic scientists often speak their own scientific language and may not fully appreciate common clinical practice needs In this textbook the biological and mechanical mechanisms of implant incorporation and loosening will be presented All new data concerning materials and methods for incorporation enhancement will be critically analyzed Data useful for clinical application will be stressed Orthopaedic Surgeons will find information which will improve their clinical practice and basic scientists will be helped to understand and appreciate clinical needs **Journal of Rehabilitation**

**Research & Development** ,1983 *Journal of Rehabilitation Research and Development* ,1986 **Implant Special** Beate Fruhstorfer,Fritz Schnitger,1997 *Applied Mechanics Reviews* ,1998 **Mechanical Testing of Bone and the Bone-Implant Interface** Yuehuei H. An,Robert A. Draughn,1999-11-29 The mechanical properties of whole bones bone tissue and the bone implant interfaces are as important as their morphological and structural aspects Mechanical Testing of Bone and the Bone Implant Interface helps you assess these properties by explaining how to do mechanical testing of bone and the bone implant interface for bone related research **Cumulated Index Medicus** ,1983 **Implant Bone Interface** John Older,2012-12-06 An update on current knowledge is given for surgeons and researchers involved in implant surgery and the development of implant arthroplasty The contributions come from a distinguished international faculty of orthopaedic surgeons biologists and engineers They examine the junctional tissues between an implant and the bone in joint replacement surgery The factors that influence junctional tissues and so affect the life span of the implant are thoroughly discussed These include detailed data on the microscopy of the junctional tissues the mechanical properties of cement and the architecture of bone and implant design The discussions following each contribution give meaningful insight into background information and the controversial aspects of surgical implants Particulate Debris from Medical Implants Kenneth R. St. John,1992 The proceedings of an October 1990 symposium in San Antonio held to address the problem of the release of particulate material debris from medical implants because of wear physical deterioration or the harsh chemical environment Examines tissue responses to such debris in order to identify factors that might moderate it such as implant material or design or postoperative drugs Member price 53 Annotation copyrighted by Book News Inc Portland OR *Tissue Engineering And Novel Delivery Systems* Michael J. Yaszemski,Debra J. Trantolo,Kai-Uwe Lewandrowski,Vasif Hasirci,David E. Altobelli,Donald L. Wise,2003-11-04 Essential to anyone working in the field this reference focuses on latest advancements in tissue construction repair and regeneration focusing on developments in gene and drug therapy the evolution of tissue engineered products and new technologies for the design of functional tissues and organ systems Veterinary Surgery: Small Animal Expert Consult - E-BOOK Spencer A. Johnston,Karen M. Tobias,2017-06-14 Selected for Doody's Core Titles 2024 with Essential Purchase designation in Veterinary Medicine Focus on the how and why of medical surgical conditions the critical issues that lead to successful outcomes for your patients with Veterinary Surgery Small Animal Second Edition This two volume full color resource offers an authoritative comprehensive review of disease processes a thorough evaluation of basic clinical science information and in depth discussion of advanced surgeries With an updated Expert Consult website you can access anytime and detailed coverage of surgical procedures it is the definitive reference for surgical specialists practicing veterinarians and residents Expert Consult website offers access to the entire text online plus references linked to original abstracts on PubMed Comprehensive coverage includes surgical biology surgical methods and perioperative care neurosurgery and orthopedics in Volume One and all soft tissue surgery organized by body system in Volume Two Extensive

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**Advances in Total Hip Arthroplasty** Yasuharu Nakashima, 2024-11-27 This book provides comprehensive evidence based surgical principles and techniques for total hip arthroplasty (THA) covering all aspects of this procedure including the history, biomaterials, biomechanics, surgical techniques and other important issues. Beginning with an overview of the hip joint and its anatomy, the authors detail the biomechanics of the hip joint in its various states and further discuss the properties of biomaterials in arthroplasty. The book describes the principles of surgical technique, preoperative planning, surgical procedures, rehabilitation and management of complications and thoroughly illustrates surgical procedures to enhance the reader's understanding. The book also introduces the technical aspects of the procedure including how to deal with difficult cases such as severely deformed cases and how to increase the safe range of motion. **Advances in Total Hip Arthroplasty** is written by a pioneering team of authors in cooperation with the Japanese Society for Replacement Arthroplasty (JSRA). The book is informative and provides practical tips for THA and academic insights for orthopedic surgeons and residents specializing in arthroplasty. The translation was done with the help of an artificial intelligence machine translation tool. A subsequent human revision was done primarily in terms of content.

**Computational Bioengineering: Current Trends And Applications** Miguel Cerrolaza, Manuel Doblare, Gabriela Martinez, Begona Calvo, 2004-07-06 This book is a significant contribution to the state of the art in the field of computational bioengineering from the need for a living human database to meshless methods in biomechanics from computational mechanobiology to the evaluation of stresses in hip prosthesis replacement from lattice Boltzmann methods for analyzing blood flow to the analysis of fluid movement in long

bones among other interesting topics treated herein Well known international experts in bioengineering have contributed to the book giving it a unique style and cutting edge material for graduate students academic researchers and design bioengineers as well as those interested in getting a better understanding of such complex and fascinating human and living processes     Biomaterials in Orthopedics Michael J. Yaszemski,2003-10-17 Written by respected experts in the field Biomaterials in Orthopedics discusses bioabsorbable biomaterials for bone repair nondegradable materials in orthopaedics and delivery systems Topics in this text include biocompatibility and the biomaterial tissue interface self reinforced bioabsorbable devices and guided regeneration bone substitutes     *Journal of Rehabilitation R & D* ,1986     **Encyclopedic Handbook of Biomaterials and Bioengineering: v. 1-2. Applications** Donald Lee Wise,1995

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