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Editors

Platelet Rich Plasma in Orthopaedics and Sports Medicine

Springer

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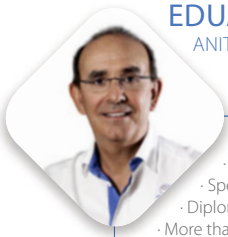

EDUARDO ANITUA

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· Degree in General Medicine and Surgery from the University of Salamanca (1979).
· PhD in Medicine from the University of Valencia.
· Specialist in Stomatology from the University of Basque Country (UPV/EHU) (1982).
· Diploma in Prosthodontics and Occlusion from the Pankey Institute (Florida, USA).
· More than 300 papers published in national and international journals.
· Author of 14 books and co-author of 7 books and chapters, being translated languages.
· 46 international patents in the fields of regenerative therapy and implant dentistry.
· Director of the programme "Continuing Education on Oral Implantology and Rehabilitation" given in Spain and various other countries for the last 25 years.
· More than 600 courses and conferences around the world on Tissue Regeneration, Implantology, Prosthodontics and Aesthetic Dentistry.

MIKEL SÁNCHEZ

Medical and Scientific Director of the Arthroscopic Surgery Unit (UCA), Hospital Vithas San José.

· Degree in Medicine and Surgery from the University of Bordeaux, France (1978).
· Specialized in Traumatology and Orthopedics at the University of the Basque Country, Spain. (1984).
· Head of the Arthroscopic Surgery Unit (UCA), Vitoria-Gasteiz, Spain (1995)
· Ph.D. in Medicine by the University of the Basque Country,, Spain (2017).
· Mikel Sánchez has been one of the pioneers in the advance of Arthroscopic Surgery in Spain.
· Part of Leeds-Keio teamwork (1986-1997), an Anglo-Japanese collaboration in order to boost developed prototypes of surgical equipment for the anterior and posterior cruciate ligament reconstruction and for the treatment of shoulder chronic instability.
· In 2000, he understood the therapeutic potential of PRP and its applications in traumatology.
· Since 2012 is a precursor in Spain of the use in surgery of 3D printing technology.
· Author of more than 250 national and international lectures, book chapters, international patents and more than 65 international scientific articles.

RAMÓN CUGAT

President of the Board of Trustees of the Garcia Cugat Foundation for Biomedical Research.
Director of the Garcia Cugat Foundation Chair at the CEU-Cardenal Herrera University on Regenerative Medicine and Surgery.
President of the medical council of the Catalonian Soccer Federation and member of medical staff of the Spanish Soccer Federation.
Co-Director of the Orthopaedic Surgical Department, Arthroscopia GC; an ISAKOS-Approved Teaching Center.

· Degree in Medicine and Surgery from the University of Barcelona (1975).
· PhD in Medicine from the University of Barcelona (1978).
· Specialist in Orthopaedic and Trauma surgery (1979).
· Post-graduate studies on Arthroscopy and Sports Medicine at Massachusetts General Hospital, Harvard Medical School Massachusetts-U.S.A.
· Associated Professor at the Medical School at Barcelona University and UIC.
· Active member of the Royal European Academy of Doctors.
· Member and honorary member of many national and international societies including ISAKOS, AAOS, AANA, ICRS, SLARD, ESSKA, AGA, SECOT, AEA, FEMEDE, HERODICUS SOCIETY, ASIAM PACIFIC INSTITUTE (Member of BOD) among others.
· Over 150 publications between specialised journal articles and book chapters.
· He has given lectures in congresses and collaborates in Teaching Courses of Arthroscopic Surgical Techniques and Sports Medicine around the world.

AUTHORS

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PROLOGUE

It is not routine to be asked to write the prologue to a book on a topic somewhat removed from one's area of expertise. In trying to justify my acceptance to do this prologue I certainly took into account my long friendship with Eduardo Anitua, but thinking about reasons to do it I thought that having only little more than a layman knowledge about platelet rich plasma would give me a more unbiased view of this controversial subject.

PRP and its relative, stem cells, have been for some years at the forefront of innovative therapies for many medical conditions, especially musculoskeletal affections. And, as it has happened many times before with new techniques or therapeutics, they have been embraced enthusiastically by many, unfortunately including entrepreneurs and even charlatans. This has led to indiscriminate use and even abuse of these therapies before clinical evidence of their value was obtained. And both industry and individuals have benefitted greatly when basically no or minimal information about their real effect was available.

But with the passage of time more information is accumulating on the real importance of these substances and their unquestionable value in the treatment of many conditions. For example, there are now systematic literature reviews of randomized and prospective studies showing that injections of PRP into osteoarthritic knees secure better functional outcomes at 6 months than placebo or hyaluronic acid injections, although no difference in pain or patient satisfaction was shown.

This book represents a compendium of the knowledge available today on Platelet-rich plasma preparations, their formulations, methods of production, mechanism of action, different effects, and their applications to musculoskeletal conditions. It represents an attempt to "drain the swamp" and to provide evidence-based information in a field where that is painfully scarce.

In 16 chapters the authors have provided abundant information on the basic science of Platelet-rich plasma preparations, the already classical applications of these formulations to orthopedic conditions, primarily joints, tendons and muscle injuries, the use in dentistry and oral surgery (so the book extends beyond the realm of sports medicine), but there are also chapters that address other less common applications, such as nerve injuries or low back pain. One may frown at these novel uses of PRP, or at its intraosseous use in knee osteoarthritis. I would reason that background science for their use in these conditions appears sound and it seems reasonable that it should be up to the "developers" to first explore with well-designed studies the limits of these therapies.

The book is attractively produced, nicely illustrated and represents the authors long experience with PRP. It should be read by anybody who intends to use or has been using PRP in clinical settings. It will be therefore a valuable asset for orthopedists, oral surgeons, sport medicine physicians and all those interested in musculoskeletal conditions. The editors and authors deserve congratulations and thanks from all those of us that will benefit from reading this text.

Miguel E Cabanela, MD, MS (Orth Surg)

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INTRODUCTION

The adventure of the plasma rich in growth factors began in 1995 as a result of questioning ourselves about what were the biological mechanisms involved in the regeneration of the post extraction socket. I was deeply concerned to understand why a patient who underwent a tooth extraction healed in a few days and the process for other patients was instead slow and painful. The key to this question was in the blood clot and so we began to investigate what would be the clot's optimal characteristics in order to make it extendable to all patients and thus achieve an optimal healing.

We began investigating ways of anti-coagulating the blood and how to reverse the coagulation cascade, and as we closed fronts, others were opened. What was the effective concentration of platelets? Would it make sense that the plasma we prepared had white blood cells? At this point, I have to thank the extraordinary collaboration with Drs. Nurden, with whom we at our foundation have been tireless collaborators during all these years. Throughout these 25 years, we have studied many of the biological repair processes using different cellular phenotypes. We have also defined the release kinetics of proteins from the fibrin matrix, a fundamental process to be able to understand the effect of these molecular signals at the injury site. A pioneering work published in 1999 on the use of an autologous PRP from small volumes of blood was the key in the development of this biological system.

Following the path of the evolution of mammals, where the tooth was first and then bone and vertebrae, in 2001 and with the extraordinary collaboration of Dr. Mikel Sánchez, we began to investigate the possibilities of clinical application in the area of Orthopedics and sports medicine.

Everything was uncertain, and in the arduous path of intuition to evidence, a great effort had to be made, both in the laboratory and in the surgical experimental room, performing innumerable surgeries in animals that would eventually derive the gold standard in orthobiology in the clinical protocols that are currently used worldwide.

Thanks to Mikel and all his team, this path has been exciting and so much so that a 2003 article appears as the first work on the application of a PRP in the area of orthopedics and sports medicine in the world literature.

They have been years of hope and passion, where everything was yet to be discovered. There was nothing written on this subject and therefore the canvas was blank, which made the project even more interesting at the same time as challenging.

I believe that we have provided a new biological approach to orthopedic surgery where other teams have contributed to consider PRP as an irreplaceable tool in the therapeutic arsenal of the orthopedic surgeon and sports doctor.

Thanks to the extraordinary collaboration of my good friends, Drs. Mikel Sánchez and Ramón Cugat, as well as of all the authors, we offer the reader the most up-to-date information on the use of plasma rich in growth factors in orthopedics and sports medicine.

I would like to also express my gratitude to Dr. Miguel Cabanela for the preparation of the prologue. I hope that the reader will enjoy and be passionate about this book as much as we all have enjoyed working on it.

Dr. Eduardo Anitua