

Healthcare Engineering Lecture Series

Title: Minimally Invasive Partial Hip Replacement System.

Speaker: Javier Cortés Cubero, MD & PhD, orthopedic and trauma surgeon, Hospital of University of Valencia, Spain

Education:

- MD, University of Zaragoza, Spain.
- PhD, University of Valencia, Spain.
- MS, Traumatology, University of Barcelona, Spain.

Qualifications:

- Inventor, minimally invasive surgical device & method for displaced intracapsular hip fracture.
- Specialist trainings: Traumatology and Orthopedic Surgery, General and Digestive Surgery, Family and Community Medicine.
- Doctor for the Spanish Men's Water Polo National Team and Spanish Women's Water Polo National Team.

Time: Tuesday, March 9, 2021, 10:00 – 11:20 AM

Zoom: <https://zoom.us/j/98890792479?pwd=eTZCV0JtSmxRTHRTN1A0UWhXNIB1dz09>

Abstract:

The displaced intracapsular hip fractures in the fourth-age patients (over 80 years old) pose a difficult challenge to a large number of healthcare systems worldwide. This is due to the fact that this type of fragile patients very often suffer serious post-operative complications. The complications always cause longer hospital stay that creates an additional cost of thousands of millions of dollars to the healthcare systems. In order to solve this problem, we have focused on minimizing the aggressiveness of the treatment in this type of fractures with a view to decreasing the number of post-operative complications by designing the following:

- A brand-new instrument set for the extraction of the femoral head in a minimally invasive way.
- A brand-new partial hip prosthesis which is a hybrid between an intramedullary femur nail and a standard partial hip prosthesis.
- A brand-new instrument set for the insertion of each prosthesis component in a minimally invasive way.

Since 2015, the project has gone through the following phases:

1. 3D design.
2. Functional validation with 3D printed polyamide prototypes in corpse.
3. Prosthesis manufacture using titanium alloy (Ti6Al4V).
4. Mechanical validation; stress and fatigue tests performed in the Instituto de Biomecánica de Valencia, Spain.

From the point of view as a surgeon, the speaker thinks students would benefit the most from a lecture which focuses on and addresses the problem-solving of various technical issues that the project has encountered throughout regarding the new prosthesis and instrument set.

Biography:

Dr. Javier Cortés is an orthopaedic and trauma surgeon currently working at the Hospital Clínico Universitario in Valencia, Spain. He has worked with trauma patients (fractures) in most of his career. The impact of hip fractures in the elderly patient as such, as well as in his/her family and society as a whole, prompted him to pursue a PhD focusing on the minimization of the aggressiveness of the surgery in a specific type of hip fractures, the displaced intracapsular hip fractures in fourth-age patients.