

**UNIVERSITY OF MEDICINE AND PHARMACY**

**“CAROL DAVILA” BUCHAREST**

**DOCTORAL SCHOOL**

**MEDICINE**

**IMAGISTIC ALGORITHM IN DYSPLASTIC HIP ARTHROPLASTY**

**SUMMARY OF HABILITATION THESIS**

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I draw up this thesis in three parts, regarding the recommendations of the National Council for Attestation of Academic Titles, Diplomas and Certificates. In the first part I stated my professional, didactic and research wise accomplishments. In the second part I stated my scientific and surgical approach regarding the dysplastic hip arthroplasty. The third part is represented by the bibliographic references that underpinned this paper.

I chose the subject of the paper “Imagistic algorithm in dysplastic hip arthroplasty” regarding the severe psychological and social outcome that this congenital disease has among patients, especially on the young ones. This pathology is of utmost significance in the surgical, scientific, didactic and research field of orthopaedics. I consider this present paper establishes a continuance for my doctorate thesis submitted in 2011.

This chapter of orthopaedic pathology has a lengthy history, going through trial stages and challenging conservative treatment, then surgical treatment starting with pelvis and proximal femur osteotomies and stretching to modern surgery of hip arthroplasty and its particularities that I will approach in this thesis.

The particularities of this condition emerge on the one hand from intrinsic and extrinsic factors like young age, severe architectural disturbances of the hip and on the other hand from the surgical technical difficulties burdened with a high rate of postoperative complications and failure.

In the beginning of this thesis I will expose in detail my didactic journey, within the natural timeline, starting with my determined position as a Teaching Assistant towards Associate Professor within the University of Medicine and Pharmacy “Carol Davila” Bucharest, evolution based on an intense scientific and research activity, emphasizing on the publicist activity, where the high preoccupancy for the quality, design and applicability of orthopaedic implants can be observed.

Prevailing in the research and professional activity is the study of this pathology regarding its evolution of the affected hip to arthritis, manifested through the doctorate thesis “The contribution of imagistic techniques in diagnosing and treating developmental dysplasia of the hip”. The research area

extended with my participation in numerous scientific research projects of the osteoarticular system's pathologies regarding the traumatic field and the orthopaedic, degenerative and tumoral field where I fulfilled the role of a principal investigator, co-investigator and project manager.

As a publicist I had a significant contribution as a Lead Author, Co-Author or Contributor within 7 specialty papers, treatises and monographies oriented on the surgical and scientific research field.

Likewise, in the publicist field I mention over 30 papers in extenso published in ISI Thomson-Reuters indexed Journals as a Lead Author and Co-Author and 34 papers in extenso in other BDI International Databases. Here I can add the 20 CNCSIS indexed articles and 27 summaries published in ISI indexed Journal Supplements on the occasion of scientific manifestations and events of other specialties connected to Orthopaedy and Traumatology, 36 summaries published in the Supplements of international databases on the occasion of National and International Congresses or Conferences, and not least 80 papers, oral presentations and posters within the country and abroad.

In the second part of the thesis I exposed the main order of research within fundamental research as well as within applied research in collaboration with the Biomaterials Department of the Polytechnic university Bucharest, COMOTI - Romanian Institute of Research and Development, Babes Bolyai University, Institute of Chemistry, etc., therefore being able to apply for projects regarding clinical studies and diverse research themes within biomaterials domain, as well as being able to research in great detail the orthopaedic implants. The research activity merged with my professional surgical activity and the result concluded towards arthroplastic solutions for the developmental dysplasia of the hip.

The Orthopaedic and Traumatology Department of the Clinical Emergency Hospital of Bucharest is part of the National Arthroplasty for Program, being able to access a great variety of prosthetic implants, from the regularly used, conventional implants to the small, anatomical morphology adapted ones and the exceptionally used ones – designed to augment the bony defect generated by this pathology.

Not least, the Orthopaedic Clinic where I activate is one of the few Clinics in the country that possesses accreditation of the Romanian National Transplant Agency to use bone and tendon grafts essential for the arthroplastic reconstruction of the severe affected hips with high dislocation, that present the challenge of restoring the hip's center of rotation and in need of extensive understanding, surgery and experience.

Establishing the imagistic investigations indispensable for the surgical planning and the criterion for improving the execution technique and diminishing the error regarding the measurements and the planning:

- Classic X-Ray, conventional method of early diagnose in osteoarthritis secondary to developmental dysplasia of the hip, with low cost and accessible, and the correct choosing of reference points for the measurements on anteroposterior, false profile and special exposures;
- The Computer tomography as a ground technique in evaluating the anterior, posterior or global bony defects in 2D – that we corroborate with the standard X-Ray, as well as in 3D – that is more accurate and generates a map of the acetabulum that improves the planning and the implant choice;
- The MRI exam offers significant data regarding the cartilage, the presence of hypertrophy and labral lesions, the lengthening or the rupture of the ligamentum teres – even higher in accuracy in arthro-MRIs;

These aspects that I approached during my doctorate stage and that I thoroughly addressed during my post-doctorate time are the fundamental mean of my continuous research, being in deep connection with my scientific activity and with my professional and surgical activity, by elaborating articles and degree papers that also involve students and the young doctors which will study, deepen the research in this field and treat the patients with developmental dysplasia of the hip in the future.

Considering the fundamental research results, another way that I plan to extend my scientific research involves estimating the necessity robotic assisted surgeries in the arthroplasty of the developmental dysplasia of the hip vis-à-vis the functional outcomes and the cost-efficiency aspects.

I choose this subject of research and I find that there is a shortage of data in the scientific literature regarding this technique and seeing an advance in the functional outcomes, in light of this technology guided surgery, of the patients that are a challenge for the orthopaedic surgeon.

The idea of developing the CT scan technology relies on the preoperative planning on 3D images, with the calibration of the virtual cup, femoral stem and femoral neck, improving the surgical technique and thus the final outcome.

Another aspect that I must mention that catches my attention and I prioritize in my research and surgical activity is the professional and social rehabilitation of these patients, the difficulty of rehabilitation corresponding with the complexity of the surgical act.

The last part of the thesis offers the bibliographic references.