To the Chairman of the Scientific Council,
UMHATEM "N.I.Pirogov", Sofia

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POSITION
By

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Appointed by Order No. RD 26-1181 / 19.06.2019 by the Director of UMHATEM "N.I.PIROGOV" Prof. Assen Baltov as an external member of the scientific jury

About:
Procedure for awarding a Doctorate degree in higher education area 7. "Health and Sports" in professional section 7.1 "Medicine" and scientific specialty "Orthopedics and traumatology ".

The opinion was prepared in accordance with the Academic Development Act in the Republic of Bulgaria, Rules for the implementation of this Act, Rules for development of the academic staff at the University Hospital "N.I.PIROGOV", Appendix № 1 of these Rules.

Dr. Dimitar Todorov was born in 1987 in Yambol, where he graduated his secondary education. He obtained his masters degree in medicine at the Medical University of Plovdiv in 2012 and a specialty in Orthopedics and Traumatology in 2018 after specialization in the UMHATEM "N.I.PIROGOV". He is currently a specialist in orthopedics and traumatology at UMHATEM "N.I.PIROGOV". Dr. Todorov's professional career has taken place at the leading trauma center in Bulgaria. This enables the thesis doctor to work with a wide variety of complex pathologies and to have extensive clinical experience in a short time.

Dr. Todorov has completed the following traumatology courses: AO Trauma course Basic Principles of Fracture Management and AO Trauma course - Advanced Principles of Fracture Management. They are the basis for high quality work and a modern approach in the treatment of fractures.
He is a member of AO Trauma and EORS.

Fractures of the distal femur are common, difficult to treat and with severe consequences for the patient. In addition, their frequency has been in upward trend in recent years.
In the past, their treatment has been largely conservative and associated with many undesirable complications, thus leading far from optimal clinical outcomes. Currently, operative stabilization is the method of choice for the treatment of distal femur fractures. Modern implants application can achieve anatomical restoration of the length and axis of the limb, reposition of the joint surfaces and the possibility of early rehabilitation.
The medico-social importance of the thesis is determined by the high up-to-date criteria for good treatment result, need for fast restoring the work ability and cost effectiveness of treatments that have undergone significant dynamics in recent decades.

The dissertation is presented in the typical for this type of work structure in 121 pages, 13 tables and 32 figures and 9 graphs. It includes: introduction (1 page), literature review (36 page), bibliography (10 page with 272 literary sources, 4 in Cyrillic and 268 in Latin).
Throughout the rest of the dissertation Dr. Todorov clearly stated the purpose of the work: **To perform retrospective analysis of outcomes and complications in patients with AO / OTA A and C distal femur fractures, fixed with locking plates and differentiating the leading risk factors leading to issues with the consolidation of the FDF. In addition, the purpose is to make recommendations for optimizing the operational method through performing biomechanical laboratory tests.**

There are four tasks that are stemming from the purpose of the work, they are clearly defined and allow for achieving the goal of the thesis.

Study Material, Clinical Methodology and Operational Material technique, own results, their analysis, and their own conclusions and contributions are reviewed sequentially.

For a period of 5 years (January 2013 - December 2017), 57 distal thigh fractures were tracked. The evaluation of the results was carried out with modern radiographic methods and clinical evaluation of the Schatzker and Lysholm knee scoring scale. The used surgical technique is presented in detail.

A model of the fracture in artificial bones is studied in a biomechanical study conducted in the Department of Biomechanics in AO Research Institute in Davos, Switzerland. The results are analyzed using modern statistical methods and SPSS software v. 21 for statistical analyzes.

The results of the studies are correctly and accurately described. There is an emphasis on the subjective assessment of the patient and the observed complications. Important practical conclusions are drawn.

A 30-page Discussion chapter provides an extensive analysis of the results of the dissertation on the subject, as well as comparison with works of other authors that analyzed the topical issue. Indications and techniques for surgical treatment have been critically considered. The advantages of mini-techniques are outlined in the light of clinical results. The copyright results are compared with existing literature data. There is an in-depth analysis of the model of fracture of the artificial bones.

I fully agree with the author's conclusions:

1. High-energy fractures and the presence of associated injuries to the musculoskeletal system are risk factors for problematic consolidation of the FDF.
2. The presence of risk factors and their combination are relative indications for augmentation of fixation with a lateral locking plate.
3. The augmentation of fixation creates biomechanical prerequisites for:
• Reducing the number of early and late complications (loss of reposition; debricolage);
• Possibility of early weight-bearing on the limb.

I can emphasize the following contributions of the dissertation:

1. There is a detailed investigation and analysis of the minimally invasive fixation with angular stability plates for distal femur fractures.
2. A detailed statistical analysis has been carried out to differentiate several factors leading to poor results from treatment, as well as problems with the consolidation of fractures.
3. There is an experimental study of the advantages of the technique for augmentation of the fixation of fractures of the distal femur.

Notes:
1. The inclusion of a larger group with post mortality assessment upon treatment goes beyond the topic of work and could be removed.
2. The scientific work inputs could be synthesized and exposed in a concise and more specific manner.
3. Contribution 5 is part of the research methodology.

In conclusion:
The dissertation submitted for my opinion shows the possibility of the author to put forward a scientific thesis and a methodology for its decision, their ability to select and process material, as well as make statistically reliable conclusions on a current and specific topic - minimally invasive fixation of fractures of
distal femur.

The dissertation work corresponds completely to the qualitative and quantitative criteria set out in the Law on Development the academic staff in the Republic of Bulgaria, the requirements for the dissertation work for the acquisition of educational and scientific degree "DOCTOR" and Rules for the development of the academic staff of UMHATEM "N.I.PIROGOV". Therefore, I give a positive assessment of the thesis and I urge the members of the Scientific Jury to award Dr. Dimitar Todorov the educational and scientific degree "Doctor" (Ph.D.) in science
specialty "Orthopedics and traumatology".

/ Prof. Dr. Plamen Kinov, MD/