

STATEMENT

of Prof. Dr. Krasimira Kalinova, MD

Department of Special Surgery -Trakia University - Medical Faculty Stara Zagora, Clinic of Pediatric Surgery

Subject:

Procedure for awarding the degree of Doctor of Education and Science to Dr. Edmond Videnov Rangelov for his dissertation on „**Current management and application of minimally invasive surgery in the treatment of undescended, nonpalpable testis in childhood**“ in the scientific specialty "Pediatric Surgery" in the professional field 7.1. Medicine in the field of higher education 7. Health and Sport.

Scientific supervisor: Prof. Hristo Shivachev, MD

Submitted according to the decision of the Scientific Council protocol ND-01-3/21.09.2022 and discharged with the right of defense in the scientific specialty of Pediatric Surgery.

1. Brief data about the doctoral student:

Dr. EDMOND VIDENOV RANGELOV was born on 13.03.1968 and graduated from the Medical University of Sofia in 1995. Since 2002 he has acquired a specialty in General Surgery, and since 2012 - a specialty in Pediatric Surgery. He has held qualification courses in laparoscopic surgery (2007, Military Medical Academy - Sofia and 2010, University Hospital – „N.I.Pirogov“-Sofia).

He has good language skills /German-A2, English-B2/, as well as good computer literacy. Good knowledge of Microsoft Office packet. Possesses good mentoring skills acquired by giving lectures and tutorials to medical students .

The dissertation was discussed, accepted and scheduled for defense by the Scientific Council of the University Hospital "N.I. Pirogov"

The set of materials submitted to me on paper and electronic media is in accordance with the Regulations for the Extension of the Academic Staff of the University Hospital „N.I.Pirogov“ . I have not found any omissions in the attached documentation.

2. Relevance and importance of the topic:

The management and optimal treatment of undescended testis is still debatable- a subject of debate for decades. The consensus reached in the scientific community after numerous studies have led to the increasing use of laparoscopy for the diagnosis and treatment of NDT. Over the past two decades, researchers from different countries have been doing a tremendous amount of work to accumulate and generalize knowledge. This has led to the formulation of conclusions and consensus

statements by various European and American associations of pediatric surgery and urology regarding the management.

Isolated cryptorchidism is the most common congenital anomaly of the male genitalia, affecting almost 1.0%-4.6% of preterm infants and 1.1- 45.3% of preterm infants.

The diagnostic process in children is difficult and depends on the characteristic anatomical and physiological features of the child's organism. According to the classification accepted today, NDT can be divided into palpebre and nonpalpebre. Accordingly, palpatory into inguinal, ectopic, elevator and acquired, and nonpalpatory into inguinal, ectopic, intra-abdominal and absent (agenesis and "vanishing testis"). With the mastery of laparoscopic techniques and technical refinement of instruments, laparoscopic orchidopexy has become the standard procedure in the treatment of undescended, nonpalpebre testis.

Diagnostic laparoscopy for NPT is now the preferred procedure in most surgical centers. It has an accuracy of 95%-100% in determining the presence, position, size and structure of the testis in various studies. Therapeutic procedures such as laparoscopic orchidopexy or orchiectomy can be performed at the same time as diagnosis. It is confirmed by many authors that laparoscopy is the only method that can reliably confirm or exclude NPT.

The dissertation topic is aptly chosen and is relevant and significant.

3.The structure of the dissertation.

The structure of the dissertation is in accordance with the requirements for standard dissertation layout, according to the Law on dissertation and its application regulations. The dissertation is written in 128 pages and is illustrated with 54 figures and 31 tables. The bibliographic reference comprises 181 sources, of which 180 in Latin and 1 in Cyrillic.

4.Literary awareness.

The articles and scholarly resources used, as reflected in the literature review and bibliography, reflect the doctoral student's good literature awareness of the topic. The literature review leaves a good impression with knowledge of the subject matter, proficiency of exposition, ability to analyze and present data concisely, concretely, analytically. It covers about 1/5 of the dissertation. It is written on the basis of 181 publications, of which about 50% are from the last 10 years. The literature review is balanced and provides accurate information about the problem discussed and the need for innovations on the topic. The articles cited are from the last 3 years, which give a good assessment of the place of the dissertation tasks discussed and innovations.

Recent protocols used worldwide are analyzed, which shows a good literature awareness of the doctoral student. The literature review is systematic according to the topic and has a contributory character. The current data on all aspects of the problem - solved and debated - are presented.

5. Scientific hypothesis and aim are well, precisely and clearly formulated, scientifically justified and feasible. The literature review concludes with a summary of some unresolved issues in our country that motivate the aim of the study. The tasks to be performed have been refined and include the sequential completion of the main stages of the dissertation:

1. To determine the sensitivity and specificity of laparoscopy in the localization of PNT. 2. To evaluate the therapeutic role of laparoscopy and the types of laparoscopic techniques in different types of NPT. 3. To design and implement a diagnostic and therapeutic management algorithm for children with undescended, non-palpable testis. 4. To evaluate early and late outcomes. 5. To analyze the learning curve.

6. Patients studied, materials and methods used.

The rapid development, progression, and frequent complication of the disease in children necessitates the search for new objective indicators and a combination of diagnostic methods used in a sequence that leads to the correct diagnosis as quickly and accurately as possible.

The dissertation covers 96 children with undescended, nonpalpable testicle, unilateral or bilateral, treated in the Department of Pediatric Surgery at the University Hospital "N.I. Pirogov" for the period 2013-2021. With the help of minimally invasive surgery, 43 children with NPT were operated, and 53 children with NPT were operated conventionally.

For the purpose of the development of the clinical material and the comparative study of the results in both groups of treated children, a number of diagnostic and therapeutic methodologies, as well as analytical methods were used and applied. The specific methods allowed to achieve the set goal and obtain an answer logically related to the tasks.

7. Evaluation of the obtained results and their scientific value.

The results of the dissertation are well illustrated. The laboratory, instrumental and operative methods used are refined. A modern clinicodiagnostic characterization of minimally invasive surgical treatment depending on the finding has been made, and there are several situations in which treatment proceeds laparoscopically: 1. Finding of intra-abdominal testicular mass with the appearance and size of a viable testicle, with accompanying or non-present hernial sac 2. Identification of intra-abdominal "nubbin testis" or severely hypoplastic testis requiring removal 3. Evidence of a tumor process involving the intra-abdominal testis.

Discontinuation of surgical intervention: surgical intervention is discontinued in the absence of intra-abdominal testis or testicular remnant, and atretic vas deferens and testicular vessels.

An assessment of surgical outcomes including strictly defined indicators has been developed. Statistical analysis was performed based on modern statistical methods, making the results conclusive. The follow-up of the main part of the children included in the study is the author's personal work.

In this paper, Dr. Rangelov presents a comprehensive assessment of the actual state of the problem in pediatric patients over a 9-year period. Such comprehensive studies are lacking in our country. The

dissertation also outlines some avenues for improving the prognosis in this severe pathology. The emphasis is on early clinical diagnosis, using a complex of laboratory, immunological and instrumental methods in the diagnosis of patients.

The incidence does not differ significantly from the literature data. The analysis of the data from the studies conducted guided the dissertation to create an algorithm for diagnosis and management that would improve prognosis and have scientific application.

On the basis of the defined indications and the results of the study, an algorithm for the management of minimally invasive surgery methods has been developed, which is an essential contribution to the study of NPT. The performance of primary laparoscopic orchidopexy, with preservation of testicular vessels, in all patients with low-lying intra-abdominal testes, after gaining more experience with the laparoscopic technique, is an essential contribution. Hypoplastic testicles with postoperative changes manifested by volume reduction underwent open surgery after diagnostic laparoscopy and testicular vessels were found to enter through the internal ring of the inguinal canal. The role of laparoscopy in high-lying intra-abdominal testicles using the two-stage Fowler-Stephans method was evaluated.

The dissertation concludes with ten specific, defined conclusions arising from the conducted research, creating an idea of the overall state of the problem in recent years. 1. The laparoscopic method, as a diagnostic and therapeutic approach in NPT, is associated with high specificity and sensitivity, facilitating the choice of an optimal surgical approach. 2. The minimally invasive technique in children is distinguished by detailed representation of the anatomy of the abdominal cavity and adequate treatment of the pathology found; the possibility of switching to the more atraumatic laparoscopic-assisted surgery compared to conventional surgery; uniform hospital stay; advantage in terms of recovery and quality of life. Diagnostic laparoscopy provides 100% reliable diagnosis, leading quickly to the decision on the further management of NPT.

3. Completely laparoscopically performed orchidopexy is a fully feasible and effective technique for the treatment of low intra-abdominal testicular masses, with excellent results in the study.

4. Laparoscopic orchidopexy provides a significant success rate, without significant complications, commensurate with the open surgical technique; results in reduced postoperative pain and trauma, allows early dehospitalization, and leads to satisfactory long-term outcomes.

5. Imaging modalities /CT, MRI, scintigraphy/ have a limited role in the diagnosis of nonpalpebre undescended testis.

6. The use of hormonal treatment in NPT is appropriate only when testicular localization is specified and when high scrotal standing of the testis is found. In the case of a postoperatively high-retended testis, we consider the use of hormone therapy ineffective.

7. The efficacy of laparoscopic diagnosis and therapy for intra-abdominal and missing testes is incomparably better than that of conventional. The prolonged operative time compared with literature data is due to the present study being at the beginning of the learning curve.

Contributions

- Scientific and technical in nature:

1. Detailed contemporary literature review on the potential of minimally invasive surgical techniques in the diagnostic and therapeutic management of NPT.
2. A summary of the literature on the sensitivity, specificity, feasibility and shortcomings of imaging in the diagnosis of NPT is presented.
3. Demonstrated the advantages of laparoscopic technique over conventional technique in the diagnosis and treatment of NPT in terms of trauma and postoperative outcomes

- Scientifically applied:

1. Laparoscopy has been introduced as a routine minimally invasive method in the diagnosis and increasingly involved in the treatment of NPT.
2. First study of the involvement of laparoscopy as a minimally invasive method in the diagnosis and treatment of NPT.
3. A diagnostic and treatment algorithm for children with NPT is introduced.
4. The learning curve of the method was studied, showing a tendency to shorten the operative time in the treatment of NPT.

CRITICAL COMMENTS ON THE DISSERTATION Despite the undoubted achievements of the dissertation, critical points can still be noted concerning the reduced possibility of discussing propaedeutic points in the interpretation of the results, as well as the better layout of the manuscript.

Overall, the merits of the dissertation are unquestionable. The topic is topical and innovative, with a significant contribution to both scientific theory and practice. There is a correct approach in collecting, summarizing and analyzing the data, making sense of them and proposing conclusions on the issues. Through exploration, description, comparative and critical analysis, the factuality set out in the aim and objectives is verified and evidenced.

2. Contributions of practical-applied nature based on personal practical experience - an adequate diagnostic-treatment algorithm for diagnosis and treatment has been developed.

There are 10 publications on the topic of the dissertation out of 18 publications for the mentioned period. They reveal and promote their practical applicability and significance.

The work is distinguished by: a) topicality of the topic; precision of the studied numerous works of other authors, conducted research, examples from practice; b) original and significant for the professional community new and/or refined definitions, generalizations and conclusions. The presented publications are sufficient in volume and are in the thematic areas of the scientific field.

They have not been evaluated in other competitions and are of practical relevance. They are evidence of the correct application of the data collected and the methods used to process them.

Conclusion

I positively evaluate the scientific development and the obtained results as meeting the requirements of the Law on the Development of Academic Personnel in the Republic of Bulgaria for the Acquisition of the Educational and Scientific Degree "Doctor".

I give a positive assessment of the developed dissertation and my positive opinion for the submission of the work of Dr. Edmond Rangelov, free doctoral student in the scientific specialty Pediatric Surgery /03.01.52/. for official defense.

25.11.2022

Prof. Dr. Krasimira Kalinova, MD.

Stara Zagora