Informed consent

Project name: Prospective Validation of Pathology-based Artificial Intelligence Diagnostic Model for Lymph Node Metastasis in Prostate Cancer

Principal Investigator: Tianxin Lin

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Informed Consent - Informed Communication Page

Dear Subjects:

We extend an invitation for your voluntary involvement in the "Prospective Validation of Pathology-based Artificial Intelligence Diagnostic Model for Lymph Node Metastasis in Prostate Cancer". The leading investigator of this study is Tianxin Lin. This study has been approved by the Medical Ethics Committee of Sun Yat-sen Memorial Hospital.

Kindly review the provided information thoroughly before determining your participation in this study. Should you choose to engage in this study after gaining insights into the study, your next step would involve signing the informed consent form.

I. Background of the study

Prostate cancer is the most common malignancy in the male genitourinary system. One typical way that prostate cancer spreads is by lymphatic metastasis, and the identification of regional lymph node metastasis holds crucial importance in guiding further postoperative treatment and predicting prognosis. However, accurate pathological lymph node staging remains a challenge, especially for micrometastases. Due to their small size and limited lesion involvement, the human eye struggles with discernment, often leading to missing diagnoses. Studies have shown that conventional pathology exhibits restricted sensitivity in detecting lymph node micrometastases (<2 mm) in prostate cancer, with leakage rates ranging from 8-16%. This may pose an elevated risk of cancer progression and delay the implementation of adjuvant therapy. While immunohistochemistry and molecular markers have demonstrated the potential to enhance the detection rate of micrometastases, they are expensive and not routinely used.

II. Purpose of the study

In the previous study, we constructed and retrospectively validated a deep learning algorithm-based AI diagnostic model for lymph node staging of prostate cancer based on a large number of postoperative resected lymph node images of prostate cancer patients. We also developed an AI-assisted software for

pathological lymph node reading. During the retrospective validation, the AI system exhibited commendable performance, showing comparable sensitivity to that of senior pathologists. This capability holds promise in assisting physicians by mitigating the risk of misdiagnosing micrometastases, thereby enhancing diagnostic accuracy and efficiency. Nevertheless, there is a lack of prospective validation. This project aims to provide insights into the AI model's performance and its potential contribution to real-world clinical scenarios.

III. Introduction to the clinical research program

1, Study design: this research adopts a non-interventional approach, enrolling approximately 200 subjects. The inclusion criteria are: (1) patients with prostate cancer, undergoing radical prostatectomy and pelvic lymph node dissection; (2) patients with complete clinical and pathological data. Exclusion criteria are: (1) Presence of other tumors with pelvic lymph node metastases, (2) Low quality images; (3) patients refusing to participate in this research.

2. Study duration: this study is scheduled to take place from January 2024 to December 2025.

IV. Flow of clinical research

After signing the informed consent form, the researchers will collect your corresponding clinical information from the hospital case system, such as age, PSA levels, and treatment history. After radical prostatectomy and pelvic lymph node dissection, your lymph node slides will be acquired from the Pathology Department, scanned into digital pathology images, and submitted to the AI system for interpretation. Simultaneously, the pathologists will review the images, ensuring a cohesive and non-interfering process. When there is a discrepancy between the AI and the pathologists, a committee of senior pathologists will meticulously examine the slides to arrive at a final diagnosis. The final diagnosis will be conveyed to you through a postoperative pathology report. Participation in this study will not interfere with your routine diagnosis and treatment.

V. Costs associated with the study

In this study, pelvic lymph node dissection, lymph node histopathology staining, and pathologists slide reviewing are considered routine examinations. Consequently, you will be responsible for covering the associated costs. However, it's essential to note that the expenses related to the digital scanning of

slides and the utilization of the AI software will be covered by the researcher. Participation in this study will not contribute to any additional financial burden on you.

VI. Possible benefits

This is a non-interventional study and the results may not be directly applicable to your diagnosis and treatment, but testing your samples or analyzing the medical data will contribute to further research and understanding of the disease. This collective effort holds the potential to foster improvements in disease treatment in the future.

VII. Possible risks

This is a non-interventional study that will not affect or interfere with your regular treatment, and there is no additional risk introduced. If you have any questions during the study, you can consult with the researchers or the Ethics Committee.

VIII. Measures to maintain confidentiality

The results of this clinical study will only be used for scientific research purposes. Therefore, your participation in the study and your personal data during the study are confidential and will be protected in accordance with the law. Your name and identity will not be disclosed, and there will be no inclusion of your name in any study reports or public publications. Government administration, hospital ethics committee, investigators, and other relevant entities retain the right to access all your research materials, including clinical observation forms and trial data, as mandated by regulations.

IX. Rights

This study has undergone thorough review and approval from the Medical Ethics Committee of Sun Yat-sen Memorial Hospital. The ethical design of the protocol is paramount, ensuring that your rights and interests remain safeguarded throughout the study.

Your involvement in this clinical research study is entirely voluntary, and you hold the right to decline participation or withdraw at any point without facing discrimination or retaliation. Your medical treatment and rights will remain unaffected by your decision. During the study, if your doctor deems

continued participation unsuitable for you, they have the authority to discontinue your involvement to protect your best interests. Moreover, you will have ongoing access to information about the study, and if any new findings emerge, you will be promptly informed, allowing you to make informed decisions regarding your continued participation in the research.

X. Contact details

Should you have any concerns or inquiries regarding your participation in this study, encounter any unexpected reactions during your involvement, or face an emergency, please reach out to:

Doctor Yun Wang

Phone: 18344357173

If you have complaints, concerns, or questions about how researchers are conducting the study, as your rights being a research subject, you are encouraged to contact the Medical Ethics Committee of the Center:

Email: sysyxllwyh@163.com

Phone: 020-81332587

Informed Consent - Consent Signature Page

Subject statement

1、I have read the informed consent carefully, and the researcher has provided me with a comprehensive explanation, addressing all my queries., and I am fully aware of the following:

（1） As a subject, I will comply with the requirements of the Instructions to Subjects, voluntarily participate in this study, and fully cooperate with the researchers by truthfully and objectively providing the researchers with information about my health and related conditions prior to the participation in this study.

（2） I consent to Sun Yat-sen Memorial Hospital accessing my medical information and research results for scientific research purposes. I understand that the results of this clinical study will only be used for scientific research purposes. Except for the government administration, the Ethics Committee, and the investigators, etc. My participation in the study and my personal data in the study are confidential and will be protected in accordance with the law.

（3） My participation in this study is completely voluntary, and I may refuse to participate or withdraw from the study at any time without discrimination or retaliation, and my medical treatment and rights will not be affected.

Meanwhile, I declare:

（1） I am willing to follow the research process;

（2） This informed consent has been received.

Signed by the subject: Contact Information:

Date: Year Month Date

Signature of subject's guardian (if necessary): Relationship to subject:

Contact information:

Date: Year Month Date

Signature of witness (if necessary): Contact information:

Date: Year Month Date

Researcher's statement

2. I have comprehensively explained the study's purpose, research methodology, and operational procedures as well as the possible risks and potential benefits of the subject's participation in the study to the subjects. I have also effectively addressed all questions raised by the subject on these matters.

Signature of the investigator (who informed the subject): Contact information:

Date: Year Month Date