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MRI-derived radiomics models for diagnosis, aggressiveness, and prognosis evaluation in prostate cancer

Key words: MRI, Radiomics, Prostate cancer, Predictive model

Research Summary

This review aims to provide an overview of related studies, specifically around the development and validation of radiomics models using MRI-derived image features. The current landscape of the literature, focusing mainly on prostate cancer (PCa) detection, aggressiveness, and prognosis evaluation, is reviewed and summarized.

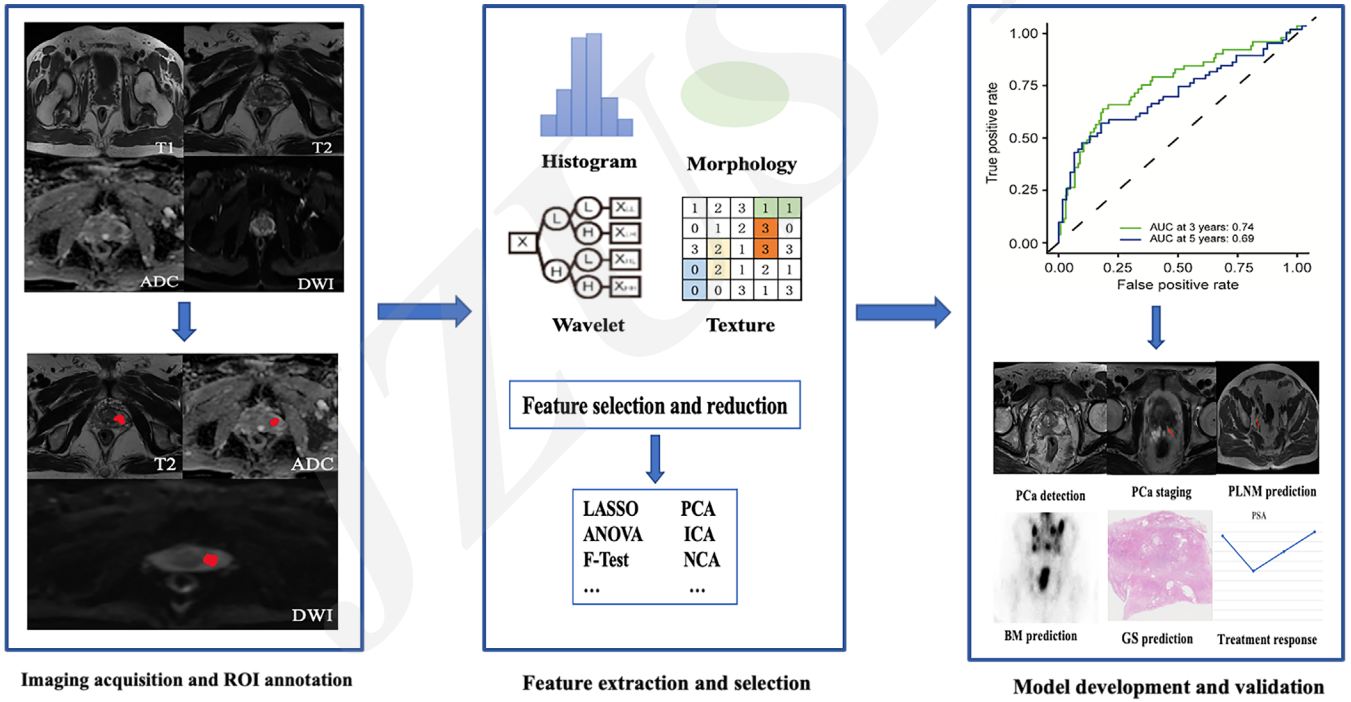


Fig. 1 The workflow of radiomics models used in PCa

Innovation points

- **This review identifies models with high potential for universal clinical implementation, rather than studies that exclusively focus on image biomarker identification and method optimization.**

- **We delve deeper into the critical concerns that different models can address and the obstacles that may arise in a clinical scenario.**

- **Radiomics has a bright future in the precise care of PCa patients, but equally faces a series of problems that need to be solved. The primary ways to overcome such obstacles are the ongoing advancement of AI technology and the standardization of the radiomics process.**

- **This review will encourage researchers to design models based on actual clinical needs, as well as assist urologists in gaining a better understanding of the promising results yielded by radiomics.**

Innovation points

A series of comprehensive tables were presented to summarize the traditional and novel radiomics-related predictive model about PCa evaluation.

Table 1 | Conventional models for staging and outcome prediction used in PCa

Table 2 | Radiomics models used for the diagnosis, risk stratification and staging of PCa

Table 3 | Radiomics models for prediction of prognosis and therapeutic responses in PCa

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