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Original Article

Myocardial fibrosis delineation in late gadolinium enhancement images of Hypertrophic Cardiomyopathy patients using deep learning methods

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ABSTRACT

Introduction: Accurate delineation of myocardial fibrosis in Late Gadolinium Enhancement on Cardiac Magnetic Resonance (LGE-CMR) has a crucial role in the assessment and risk stratification of HCM patients. As this is time-consuming and requires expertise, automation can be essential in accelerating this process. This study aims to use Unet-based deep learning methods to automate the mentioned process.
Methods: This study used three consecutive Unet-based networks for Region of Interest (ROI) detection, myocardial segmentation, and fibrosis delineation. The study was conducted on LGE images of 41 images diagnosed with HCM, which were contoured by two experts.
Results: This model reported a Dice similarity coefficient and accuracy of 89.74 and 98.22 in myocardial segmentation and 88.42 and 94.66 in fibrosis delineation, respectively, and could outperform the previous methods
Conclusion: The results confirm that using deep learning methods for delineating myocardial fibrosis not only can automate the process, but also helps improve the results and decrease the required time.