IN213-SD-MOA4

First Computer-Aided Diagnosis of Neural Foramina Stenosis

Monday, Nov. 28 12:15PM - 12:45PM Room: IN Community, Learning Center Station #4

FDA Discussions may include off-label uses.

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PURPOSE

Neuro Foramina Stenosis (NFS) is a leading cause of lower back pain and has the risk of disability. However, clinical diagnosis of NFS is a highly laborious and time-consuming task for physicians. In this study, a fully automated CAD of NFS was firstly developed and validated in clinic against manual diagnosis.

METHOD AND MATERIALS

A new label-supervised feature learning algorithm was used to transfer the experts' knowledge to computer, and then neural foramina diagnosis is automatically reported . Following IRB approval, spine magnetic resonance images from 110 subjects (58 women, 52 men, 56±12 yrs) were collected to validate the proposed CAD against manual diagnosis by two expert physicians. The performance was evaluated via the diagnostic accuracy, specificity, and sensitivity, using a leave-one-subject-out strategy.

RESULTS

High diagnostic accuracy of the proposed CAD has demonstrated by 98.52% accuracy with specificity as 100.00% and sensitivity as 97.96%.

CONCLUSION

This study demonstrated that the developed CAD has a comparable accuracy and sensitivity with the expert physicians. These findings provide an effective way to relieve the heavy burden of physicians, pay more attention to high-level clinical tasks, and offer an efficient clinical tool for neural foramina stenosis.

CLINICAL RELEVANCE/APPLICATION

Computer-aided diagnosis based on supervised feature learning offers an automated and accurate clinical tool for aiding physicians in providing efficient clinical diagnosis and timely treatment.