Pediatric posterior fossa tumor diagnosis

In pediatric posterior fossa tumors, an MRI of the lumbar spine should be done pre-op to rule out drop mets (post-op there may be an artifact from blood).

In adults, most intraparenchymal posterior fossa tumors will be metastatic, and work-up for a primary should be undertaken.

To evaluate the classification of the types of pediatric posterior fossa tumors based on routine MRI (T(1)WI, T(2)WI and ADC) using wavelet transformation analysis of whole tumor. Methods: MRI images of medulloblastoma (n=59), ependymoma (n=13) and pilocytic astrocytoma (n=27) confirmed by pathology before treatments in Children's Hospital of Nanjing Medical University from January 2014 to February 2019 were enrolled in this retrospective study as well as the clinical data of age, gender and symptoms. Registration was performed among the three sequences and wavelet features of ROI were acquired. Afterwards, the top ten features were ranked and trained among groups by using random forest classifier. Finally, the results were compared and analyzed according to the classification. Results: The top ten contribution three sequences and wavelet features of ROI were acquired from the ADC sequence. The random forest classifier achieved 100% accuracy on training data and was validated best accuracy (86.8%) when combined of first and third wavelet features. The sensitivity was 100%, 94.8%, 76.9%, and the specificity was 97.6%, 88.0%, 98.8% respectively. Conclusions: Features based on wavelet transformation of ADC sequence of entire tumor can provide more quantitative information, which could provide help in the differential diagnosis of pediatric posterior fossa brain tumors. The optimum combination to distinguish three pediatric posterior fossa brain tumors is sixth and twelfth wavelet features of ADC sequence [1)].

The objective of Kerleroux et al. was to propose a global method relying on the combined analysis of radiological, clinical and epidemiological criteria, (taking into account the child's age and the topography of the lesion) in order to improve our histological approach in imaging, helping the management and approach for surgeons in providing information to the patients' parents. Infratentorial tumors are the most frequent in children, representing mainly medulloblastoma, pilocytic astrocytoma and brainstem glioma. Pre-surgical identification of the tumor type and its aggressiveness could be improved by the combined analysis of key imaging features with epidemiologic data [2)].

References

1)
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2)
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