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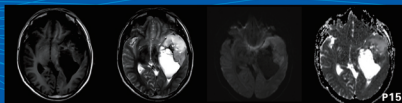
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较低级别胶质瘤(lower-grade gliomas, LGG)异柠檬酸脱氢酶-1(isocitrate dehydro-genase-1, IDH-1)突变状态和Ki-67增殖指数表达水平均与患者预后密切相关。IDH-1突变型LGG对放疗更为敏感,预后常优于IDH-1野生型LGG,而高表达水平的Ki-67增殖指数,常常表示肿瘤细胞具有较高的增殖活性,代表患者预后较差,但这两种指标只能通过穿刺活检或手术切除的方式获取。

扩散加权成像(diffusion weighted imaging, DWI)作为磁共振功能成像手段之一,主要通过反映组织中细胞内外水分子运动的变化情况来提供有关肿瘤微环境的信息,并可以通过表观扩散系数(apparent diffusion coefficient, ADC)值进行定量评估,已广泛应用于脑肿瘤的分级、鉴别及预后评估之中。

本研究回顾性分析了经病理证实并测定IDH-1突变状态和Ki-67增殖指数的44例LGG患者,同时在ADC图上测量病灶实质的最小ADC值(ADC_{min})、平均ADC值(ADC_{mean})和对侧镜像正常脑白质的ADC值,计算相对最小ADC值($rADC_{min}$)和相对平均ADC值($rADC_{mean}$)。比较LGG IDH-1突变型和IDH-1野生型组间各ADC值间差异,绘制受试者工作特征(receiver operating characteristic, ROC)曲线分析各ADC值对IDH-1突变状态的评估效能,并分析其与Ki-67增殖指数间的相关性。结果表明ADC值不仅可用于术前无创评估LGG IDH-1突变状态,且对于肿瘤细胞增殖活性的评估也具有一定的价值。详见内文第13页。

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Lower-grade gliomas (LGG) isocitrate dehydrogenase-1 (IDH-1) mutation status and Ki-67 proliferation index expression level are closely related to the prognosis of patients. IDH-1 mutant-type LGG is more sensitive to radiotherapy and chemotherapy, and the prognosis is often better than that of IDH-1 wild-type LGG, while high expression levels of Ki-67 proliferation index, which often indicates tumor cells with high proliferative activity, represent a poorer prognosis for patients, but the two indicators can only be obtained by needle biopsy or surgical resection.

Diffusion-weighted imaging (DWI), as one of the functional imaging tools of MRI, provides information about the tumor microenvironment by reflecting the changes of water molecule movement inside and outside the cells in the tissue, which can be quantitatively evaluated by the apparent diffusion coefficient (ADC) value, which has been widely used in the grading, identification and prognosis assessment of brain tumors.

Forty-four patients with LGG, which were confirmed by pathology and measured IDH-1 mutation status and the Ki-67 proliferation index were retrospectively analyzed in this study. Meanwhile, the minimum ADC value (ADC_{min}), mean ADC value (ADC_{mean}) of the lesion parenchyma, and the ADC value of the contralateral mirror normal white matter on the ADC maps were measured, and the relative minimum ADC value ($rADC_{min}$) and relative mean ADC value ($rADC_{mean}$) were calculated. The differences in ADC values between the two groups were compared, and receiver operating characteristic (ROC) curves were drawn to evaluate the differential diagnostic efficacy. The Ki-67 proliferation index of the solid tumor components was also measured to explore its relationship with ADC values. Finally, the result shows that ADC values can be used not only for preoperative noninvasive assessment of LGG IDH-1 mutation status, but also valuable for the assessment of tumor cell proliferative activity. Please see page 13.

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