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MRI

磁共振成像

CIGONGZHEN CHENGXIANG

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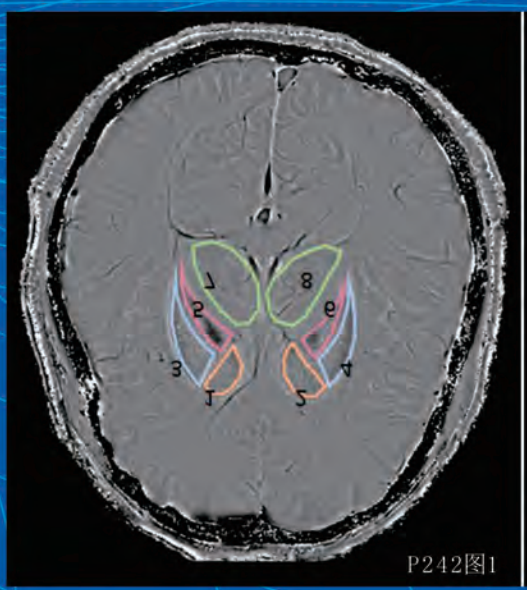
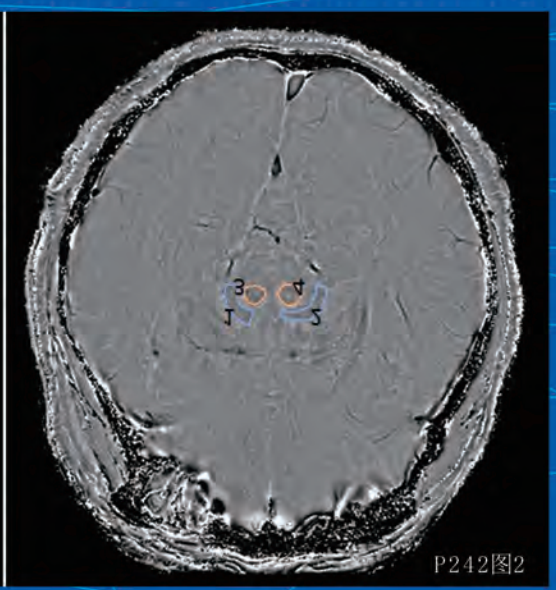


P242图1



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磁敏感加权成像(susceptibility-weighted imaging，SWI)是一种高空间分辨率三维梯度回波序列，利用血氧水平依赖效应及精确相位信息用于磁共振静脉造影术的对比增强磁共振技术，包含相位信息及幅值，可定量测量磁化率区别。通过后处理得到的最小密度投影，敏感显示血液成分、非血红素铁及钙化，可为多种神经系统病变提供诊断及治疗信息，如脑出血、血管畸形、外伤、肿瘤、先天性感染及神经退行性病变。

脑内铁沉积随年龄增长而增多，过量铁沉积是神经系统退行性变的主要危险因素之一。阿尔茨海默病(Alzheimer's disease，AD)是一种中枢神经系统退行性疾病，AD患者脑内存在异常高水平铁沉积。脑内过度铁水平上升导致氧化应激损伤被认为与AD患者脑内神经元死亡密切相关。铁与老年斑形成、神经原纤维缠结相关。通过相位值可判断铁沉积的程度，进而评估AD。

掌握脑内铁含量变化有利于鉴别正常脑内铁沉积和病理状态异常铁沉积，也有利于监测铁过量沉积所致的神经系统疾病，并对其进行半定量评估。有研究表明，AD患者的部分皮质以及深部灰质核团部位的铁沉积量明显增加，这些核团是铁沉积的敏感部位，可以判断患者病情严重程度。

因此，本研究通过对AD患者及认知正常研究对象行头部SWI序列扫描，测得双侧尾状核头、丘脑、壳核、苍白球、黑质及红核相位位移值，计算相位值，比较病例组与对照组的差异，并分析病例组各感兴趣区深部脑核团相位值与简易智力状况评分的相关性。详见内文第241～245页。

本期支持单位：中国科学院分子影像重点实验室、首都医科大学附属北京潞河医院

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About the cover

Magnetic sensitive weighted imaging (susceptibility weighted imaging, SWI) is a kind of high spatial resolution 3D gradient echo sequence, the use of blood oxygen level dependent effect and accurate phase information used in magnetic resonance venography of contrast-enhanced magnetic resonance (MR) technology, includes phase information and amplitude, the quantitative measurement of magnetic susceptibility difference. The minimum density is obtained by post-processing projection, sensitive blood composition, the heme iron and calcification, can provide the diagnosis and treatment for a variety of nervous system lesions information, such as cerebral hemorrhage, vascular malformation, trauma, tumor, congenital infection and neural degenerative diseases.

Iron deposition in the brain increases with age, and excess iron deposition is one of the main risk factors for degeneration of nervous system. Alzheimer's disease (AD) is a degenerative disease of the central nervous system. There was abnormal high level iron deposition in the brain of AD patients. Oxidative stress injury is thought to be closely related to the death of neurons in the brain of AD patients. Iron is associated with senile plaque formation and neurofibrillary tangles. The degree of iron deposition can be determined by the phase value, and then the AD is evaluated.

Master changes in brain iron content is helpful to identify normal brain iron deposition and pathological state of abnormal iron accumulation, also is helpful for monitoring excessive iron deposition caused by diseases of the nervous system, and carries on the semi-quantitative evaluation. Studies have shown that part of the cortex in patients with AD and deep gray matter nuclear regimental headquarters iron deposition quantity increased obviously, these nuclei are sensitive parts of the iron deposit, judging patients severity.

Therefore, this research through the study of AD patients and normal cognition object line SWI sequence scanning head, measured bilateral caudate nucleus, the thalamus, putamen, globus pallidus, substantia nigra and red nucleus phase displacement value, calculate the phase values, comparing the difference between the case group and control group, and analyze the cases of deep brain nuclei in various areas of interest group phase values and simple intelligence score relevance. See text page 241-245.