Introduction
Relapse of High-grade meningioma has markedly relations with their histologic proliferative features and invasive characteristic of biological behaviour. Although some immunohistochemical markers, such as Ki-67, have become an important prognostic indicator of high-grade meningioma, being able to provide their preoperative invasive features on MRI to determine more complete resection of the tumor and postoperative radiotherapy is the clinical goal.

Object
To observe the correlation of MRI imaging features and Ki-67 index in high-grade meningioma with recurrence of tumors.

Materials and Methods
30 patients, 17 female and 13 male, age range 7-73 years (average age 55 years), were performed MRI scanning and detected Ki-67 index. There were 13 grade 2 (atypical) and 17 grade 3 (anaplastic) cases in the series, where there were 16 patients with tumor recurrence including 3 grade 2 and 13 grade 3. The cystic components in the lesions, multiple lesions and vital intracranial structure involved, the latter including dural sinus, brain arterial trunk or optic nerve and extra-intracranial communication tumor, were detected by MRI.

Result
Ki-67 index of grade 3 meningiomas (12.6±8.5%) was significantly higher than that of grade 2 (5.7±4.3%)(t=2.695, p=0.013). Table 1 shows the correlation of the histologic grade, Ki-67 index, size and involving vital intracranial structure of meningiomas with relapse. According the average lesion diameters on MRI enhancement groups of ≤30, 31-40, 41-50 and ≥51 mm were 7(23.3%), 8(26.7%), 11(36.7%) and 7(23.3%), respectively. The solid, solid-cystic and mainly cystic lesions were 23(76.6%), 6(20%) and 1(3.3%), respectively. MRI showed that the vital structure involvement proved by surgical operation were 3(10%) optic nerve [image 1], 6(20%) dural sinus involved, including superior sagittal sinus, transverse sinus, sigmoides sinus, and confluens sinuum [image 2], 1(3.3%) internal carotid artery encompassed [image 3], and 4(13.3%) extra-intracranial communication tumors [image 4]. There were 4(20%) intracranial multiple lesions in the series. Logistic regression analysis showed that recurrent risk of meningioma increased with grade increase (Wald x²=5.025, p=0.025), vital intracranial structure involved (Wald x²=4.527, p=0.033) and tumor size increase (Wald x²=4.158, p=0.041). The recurrent risk of grade 3 meningiomas was 87 times that of grade 2 (OR=87.95). The recurrence risk of vital intracranial structural involved was 65 times as that of non-involved (OR=64.59). The tumor relapse risk increased 4 times as the diameter of a tumor increased one grade (OR=5.041).

Discussion and conclusion
Vital intracranial structure involved and large tumor size increase the risk of the meningioma relapse. These two indicators of MRI might play an important role in preoperative prediction of the recurrence of meningioma. Ki-67 index can act also as a predictor of the tumor recurrence. The higher the grade of meningioma is, the higher recurrence rate and the shorter the duration between recurrences will be.