Meningiomas have been recognized as an entity for nearly two centuries (1). They are well known for their diverse histological appearance, and it is related to the multipotential character of the arachnoidal cap cells, which is known to give rise to intracranial meningiomas (2). Of the many histological subtypes of meningiomas recognized, only papillary variant is known to have aggressive behavior (3). Although generally considered benign, their behavior is unpredictable and characterized by frequent recurrences. Histopathological features associated with aggressive behavior have been described, but even the World Health Organization (WHO) grading system provides broad criteria for malignancy, Mahmood et al. described a scoring system, based on 6 histopathological features, establishing objective criteria. In this study, 73 specimens from 61 cases which were diagnosed as meningioma have been reviewed and scored by the criteria described by Mahmood et al. in order to search for the availability of the application of the system.

Materials and Methods

Sections of specimens from 61 patients diagnosed as meningioma have been reviewed and scored by the criteria described by Mahmood et al. (7) in order to search if the system is available for grading these cases.

Abstract: Meningiomas are well known for their diverse histological appearance. Although generally considered benign, their behavior is unpredictable and characterized by frequent recurrences. Histopathological features associated with aggressive behavior have been described, but even the World Health Organization (WHO) grading system provides broad criteria for malignancy, Mahmood et al. described a scoring system, based on 6 histopathological features, establishing objective criteria. In this study, 73 specimens from 61 cases which were diagnosed as meningioma have been reviewed and scored by the criteria described by Mahmood et al. in order to search for the availability of the application of the system.

Key Words: Meningioma, score, grade, histopathology

Out of 61 meningioma cases 52 (76.6%) were scored as typical with Mahmood scoring system and only 3 (5.8%) had recurrences. Other 9 cases were atypical and 6 (66.6%) had recurrences of which one turned out to be malignant. Statistical analysis by Mann Whitney Confidence Interval and Test considering both described parameters and final score revealed significant increase for recurrent meningiomas. These findings highlights the routine application of Mahmood scoring system to meningiomas for a better prognostic determination.
Results

Out of 61 meningioma cases 35 (57.1%) were females and 26 (42.9%) were males. Female to male ratio was 1.3/1. The age distribution ranged from 14 to 69 for males, 5 to 65 for females and mean age was 50.62 for males and 47.61 for females. The distribution of the histological subtypes according to WHO was as follows: 16 (26.7%) meningotelial, 17 (28.3%) fibroblastic, 13 (21.7%) transitional, 4 (6.7%) psammomatous, 1 (1.7%) angiomatous, 1 (1.7%) met-
The predominance of meningiomas in the female sex is well known (8). In the series of Capadano et al. 71% of the cases were found to be occurring in females with an average age of 52.64 and 29% occurred in males with a mean age of 53.46 (10). In this series only 57.1% of the cases were females and the median age was a little younger than males.

In the series of Rohringer et al. (5) among 193 meningiomas, meningiometatous (38%) and transitional (33%) types were most frequently observed. In contrast in another series (9) meningiometal (28%), fibrous (26%) and transitional (14%) types were most frequent. In this series the most frequent types were meningiometal (26.7%), fibrous (28.3%) and transitional (27.1%).

The greatest interest in meningiomas are about the malignant potential and the clinical and histopathological implications. In the series of Mahmood et al. (7) out of 276 cases, 92% were benign with a female to male ratio of 2.3/1 and 8% were atypical or malignant with a female to male ratio of 0.9/1, suggesting increased malignant potential for the male patients. In this series 15.1% of the cases were atypical or malignant but female to male ratio was 1.2/1. The only malignant meningioma which started with a histopathologic configuration of atypical type was a male patient. The reported incidence of meningiomas in the first two decades of life is 1.8 to 6% (8,9). In this series 3(4.8%) cases were of the first two decades of life.

New tools are available for the determination of the recurrences of the meningiomas. Kunishio et al. (11) stated that AgNOR scores or proliferative potential were significantly different between recurrent and nonrecurrent meningiomas. But still the grading system according to the degree of anaplasia is of great value and cytogenetic analysis confirmed that complex chromosomal abnormalities and telomeric associations are observed more frequently in tumors with anaplasia (10). Malignancy in meningiomas has been a controversy and some have even stated that, biological behaviour cannot be predicted on histopathological analysis (12).

In spite of this Mahmood et al. (7) stated that they believed it was simply a reflection of the absence of the criteria for defining malignancy and described a detailed scoring system. In a series of 25 atypical and malignant meningiomas with the described criteria Mahmood et al. (7) reported recurrences in 51.85% and mortality in 44% of the patients during 5 to 15
The Validity of Mahmood Scoring System in Meningiomas

years follow up. In contrast only 2% of the benign meningiomas had recurrences.

In this series all the detailed criteria described by Mahmood et al. (7) have been applied to meningioma cases and a high recurrence rate (66%) have been demonstrated in atypical meningiomas. Also all parameters that could be evaluated by statistical analysis (hypercellularity, mitosis, necrosis, nuclear pleomorphism, loss of architecture) and the total score were found valuable for determining recurrences. Of these the lowest p value was found for hypercellularity and total Mahmood score. These results suggest the scoring system described by Mahmood et al (7) is valuable both at the level of each parameter and total score. Although up to now no single histopathological parameter have been accepted for determining recurrences in meningiomas (4-8), these results encourage us to reevaluate our ongoing opinions. The results obtained by few or single criteria was found unsatisfactory, which may be caused by uncertain and obscure criteria used till now. We believe these features should be evaluated in larger series seperately by different working groups before routine application. But these results encourage Mahmood scoring system in meningiomas.

References