Diagnostic Performance of Brain Tumor Reporting and Data System (BT-RADS) in Post Treatment Surveillance of Brain Glioma

Original Article

Manar Maamoun Ashour, Eman Mohammed Kamal Mohammed and Maha Abdel Meguid El-Shinnawy

Department of Diagnostic Radiology, Faculty of Medicine, Ain Shams University, Egypt

ABSTRACT

Background: Currently, structured reporting aims to revolutionize radiology's role in enhancing patient management by improving the clarity of imaging interpretation, unifying the terms used, and simply explaining scoring-linked management via the development of brain tumor reporting and data system (BT-RADS).

Objective: To assess the value of using the BT-RADS scoring system for post-treatment imaging follow-up in patients with brain glioma.

Methods: This retrospective study comprised fifty-four patients diagnosed to have brain glioma. These patients underwent sequential follow-up MRI scans over a period of twelve months. The imaging findings including enhancing component, FLAIR signal and mass effect of the MRI scans were analyzed and interpreted in the form of a checklist and eventually a BT-RADS score was given. The BT-RADS score diagnostic performance at 3 and 6 months to predict the final patient outcome were compared using the 12-month follow-up as the gold standard of reference.

Results: BT-RADS scoring at six months post-treatment showed the higher diagnostic performance in predicting final patient outcome as compared to the performance of the system at three months, with a sensitivity of 77.8% versus 72.2%, and a specificity of 94.4% versus 88.9%. Among the individual MRI diagnostic features included in this system, assessment of enhancement showed the highest performance with a sensitivity and a specificity of 72.2% and 91.7% respectively.

Conclusion: The BT-RADS scoring system demonstrates robust diagnostic accuracy for predicting treatment response at the 12-month follow-up, supporting its routine use in the longitudinal assessment of patients with brain gliomas.

Key Words: BT-RADS, gliomas, MRI.

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Corresponding Author: Manar Maamoun Ashour, Lecturer of Radiodiagnosis, Diagnostic radiology department, Faculty of Medicine, Ain Shams University, Egypt. **Tel.:** +201009768388, **E-mail**: Manar.ashour@gmail.com

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INTRODUCTION

Over the past years, the benefits of structured reporting for raising the standard of care provided to physicians and patients have been widely acknowledged. It seems that structured reporting will become even more critical in radiologists' daily workflows as artificial intelligence advances[1]. Most primary malignant brain tumors are gliomas, with glioblastoma multiforme, being the most aggressive type and having a worst prognosis[2, 3]. Magnetic resonance imaging (MRI) plays a crucial role in the diagnosis, monitoring, and management of patients with glioma. To ensure that patients with glioma receive the best care possible and ultimately increase their chances of survival, interpreting results following surgery, radiation, and chemotherapy requires in-depth understanding of the biology of the tumor as well as the unique changes that are anticipated because of each treatment method[4, 5].

For patients with primary brain tumors, the creation of a systematic reporting system with related clinical decision support offers a chance to greatly influence patient-centered care. Patients with malignant brain tumors have a devastating prognosis, which emphasizes how crucial accurate and transparent radiological reporting is to maximizing treatment results[6]. BT-RADS is a relatively recent paradigm to assess treatment response for glioma aiming to enhance clarity and ensure uniformity in reporting using structured and standardized formats. In BT-RADS each study is assigned a score or category based on the likelihood of tumor progression, which is linked to recommendations for management suggestion[7].

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PATIENTS AND METHODS

This retrospective study was done by retrieving the data obtained from the radiology department's picture archiving and communication system (PACS) and medical records at Ain Shams University Hospitals between June 2020 and September 2022. This study comprised 54 adult patients with histopathologically diagnosed brain glioma of varying grades who were referred for post treatment MR imaging surveillance. All included patients had at least three follow-up MRI brain scans over a period of 12 months duration which were performed at 3 month, 6-month and 12-month.

ETHICAL COMMITTEE

The Research Ethical Committee of Ain Shams University's Faculty of Medicine approved the study (FMASU MS 458/2022), and informed consent was subsequently waived because of the retrospective nature of the study. The exclusion list comprised patients less than 18 years-old, patients with unavailable histopathology proof of brain glioma, patients with inadequate clinical, or therapeutic data, patients with inadequate imaging as lack of post contrast sequences, and patients with BT-RADS score 0 were also excluded including the presence of infection.

Image acquisition:

The MRI scans were performed via a 1.5 T scanner (Ingenia, Philips Healthcare, Netherlands) using a 16-channel neurovascular coil with a 3-mm section thickness and no gap from the vertex to the foramen magnum. The MRI parameters for 1.5 T scanner were: Axial single-shot SE EPI DWI was acquired (b value 0 and 1000 seconds/mm2, TE/TR 111/3833 ms). ADC was automatically generated by the implemented software, including pre-contrast axial SE T1WI (TE/TR: 15/634 ms), sagittal SE T1 (TE/TR: 24/170 ms), axial FLAIR (TE/TR: 130/11000 ms), axial SE T2WI (TE/TR: 110/ 5287 ms), and Susceptibility weighted imaging (SWI) (TR/TE1/delta TE = 52/12/110ms). A gadolinium-based contrast agent was injected 1-2 mmol/ kg followed by acquisition of axial, coronal and sagittal T1 WIs.

Image interpretation and BT-RADS scoring:

All MRI scans were reviewed by two radiologists with experience of 11 years and 3 years reviewed. Interpretation of the imaging findings was made in the form of a checklist that included the main diagnostic features of the BT-RADS initially established by ***Weinberg et al.*** which are the enhancing component and FLAIR either unchanged, decreased, increased or appearance of a new lesion) and mass effect either unchanged, decreased, or increased[8]. Eventually, a BT-RADS score was given by consensus for the sequential MRI scans performed at 3, 6, and 12 months follow up according to the BT-RADS criteria.

The diagnostic performance of the BT-RADS was calculated in reference to clinical and imaging follow-up 12 months as a gold standard of reference. The patient outcome was defined as positive for tumor progression (TP) with the presence of evident clinical and imaging progression after 12 months and the outcome was defined as negative for tumor progression with the absence of definite clinical and imaging progression after 12 months follow-up. We considered BT-RADS 3a as the cut off value with BT-RADS score >3a which means that BT-RADS score 3b, 3c, and 4 are considered positive for tumour progression.

Statistical Analysis

Data were analysed using the Statistical Package for Social Science (IBM SPSS) version 23. The quantitative data were expressed as mean, standard deviation, and range. Whereas the qualitative variables were also displayed as percentage and number. The Chi-square test was used to compare the qualitative data between the groups. On the other hand, the independent t-test was used to compare two independent groups with quantitative data. The diagnostic accuracy of the BT-RADS criteria was assessed using receiver operating characteristic curve (ROC) analysis at 3 and 6 months in predicting BT-RADS results at 12 months. The *p-value* < 0.05 was considered significant (S), while highly significant if < 0.01: (HS)

RESULTS

The included patients were thirty female patients and twenty-four male patients with mean ±SD of 42.37 ± 11.2 and range of 23 – 70. Considering the tumor grade; two patients had astrocytoma of grade 1, thirteen patients had astrocytoma of grade 2, eighteen patients had astrocytoma of grade 3, and twenty-one had astrocytoma of grade 4. Of the 54 patients evaluated, 50 (92.6 %) underwent surgical management. Incomplete tumor resection was performed in 35 patients (64.8 %), whereas complete resection with histologically clear margins was achieved in 15 patients (27.8 %). Adjuvant chemoradiotherapy was subsequently administered to 43 patients (79.6 %), while the remaining 11 patients (20.4 %) received no additional oncologic treatment.

At the 12-month follow-up, 18 of 54 patients (33.3 %) exhibited radiologically confirmed tumour progression, whereas 36 patients (66.7 %) remained progression-free. Progression was disproportionately concentrated in WHO grade 4 gliomas: 11 of the 18 progressing cases (61.1 %) were grade 4, while the remaining 7 cases (38.9 %) were grade 3. This distribution indicates a statistically

significant association between tumour grade and early recurrence, with higher-grade gliomas demonstrating a markedly greater risk of progression (χ^2 test, $p < 0.05$).

Like the well-known BI-RADS system, it assigns a numerical category from 0 to 4 that indicates the likelihood of tumor progression (TP). For example, 0 represents baseline, 1 represents improvement, 2 represents no change (Figure 1), and 3 represents worsening imaging findings that are divided into three sub-types based on the probable cause: 3a represents treatment effect (Figure 2), 3b represents an indeterminate mixture of treatment changes and tumor, 3c represents favouring tumor progression (Figure 3), and 4 represents worsening imaging that is highly suspicious of tumor progression.

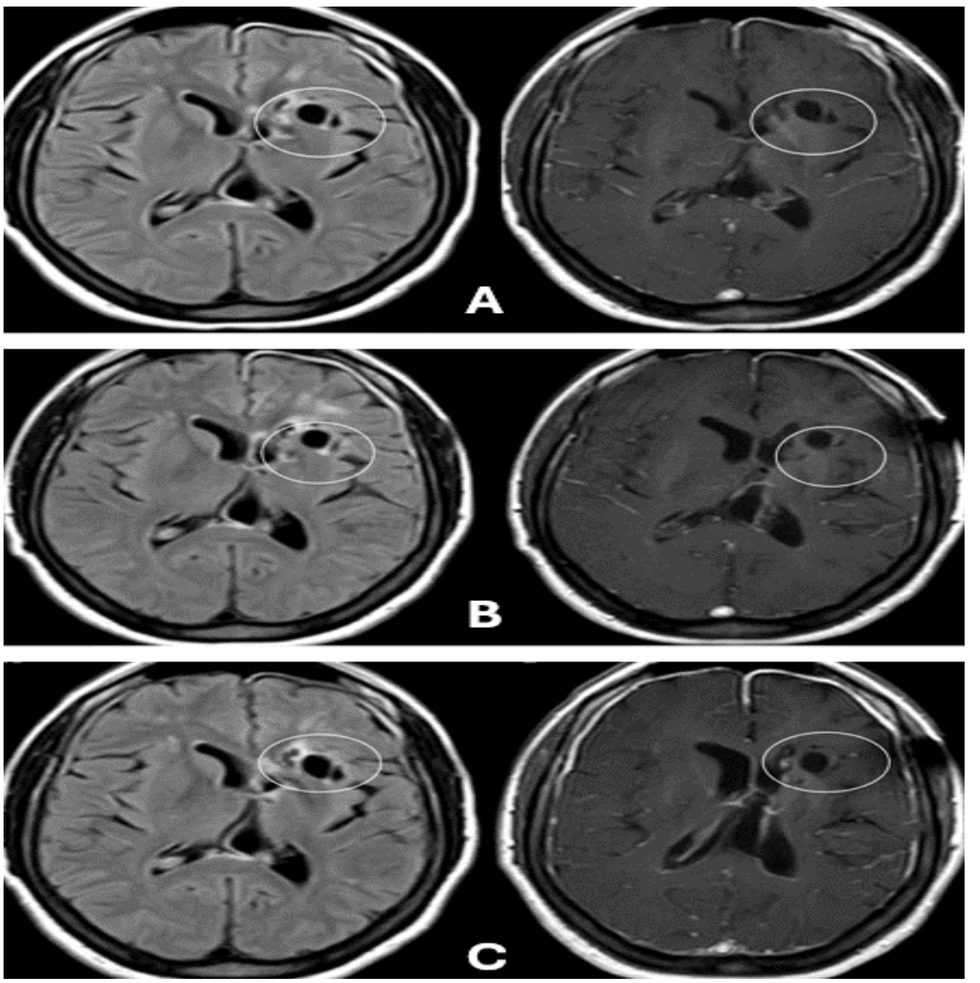

Fig. 1: Follow-up studies for a known case of astrocytoma grade 2 with no evident tumor progression, (A) three-month follow-up scan and (B) six-month follow-up scan showed stationary appearance of the imaging findings with no new FLAIR or enhancing lesions keeping with BT-RADS 2, with still noted stationary appearance in the 12-months follow up scan (C).

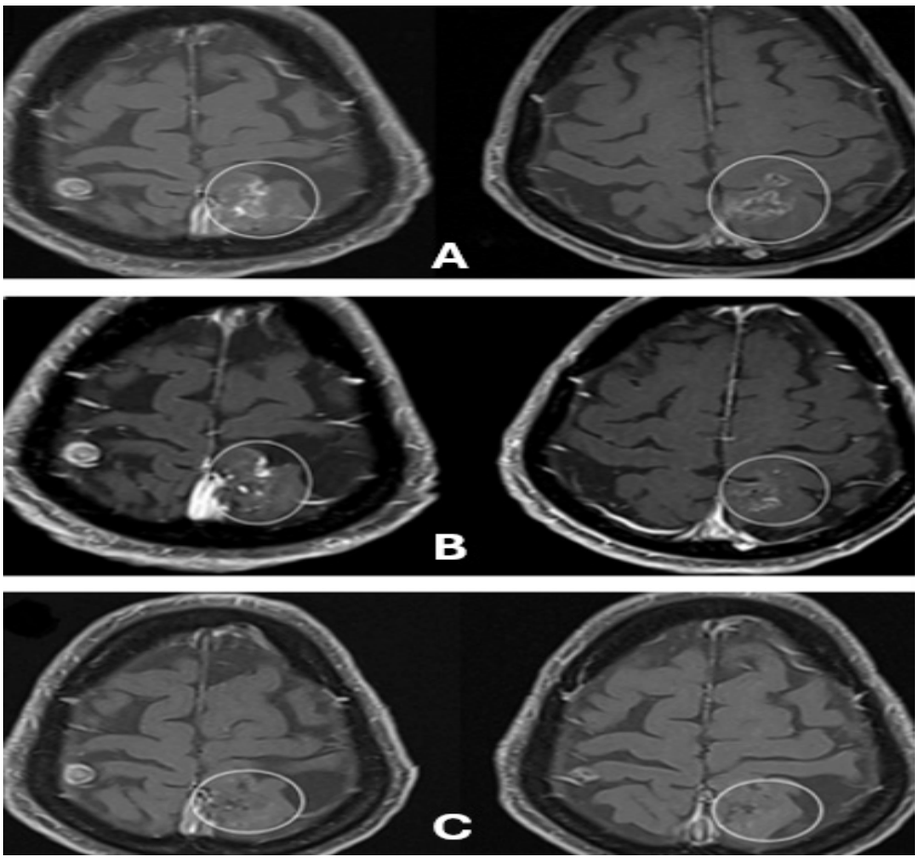

Fig. 2: Known case of diffuse astrocytoma grade 2, submitted to radiotherapy CE T1 WIs done (A) three months follow up scan showed newly appearing post-contrast enhancement with no worsening of the patient clinical status so BT-RADS 3a was given instead of BT-RADS 3c and it was confirmed to be pseudo progression by improvement in imaging findings on the subsequent six-months follow up the scan (B) without additional treatment and almost total resolution of the enhancement noted in 12 months follow up the scan (C).

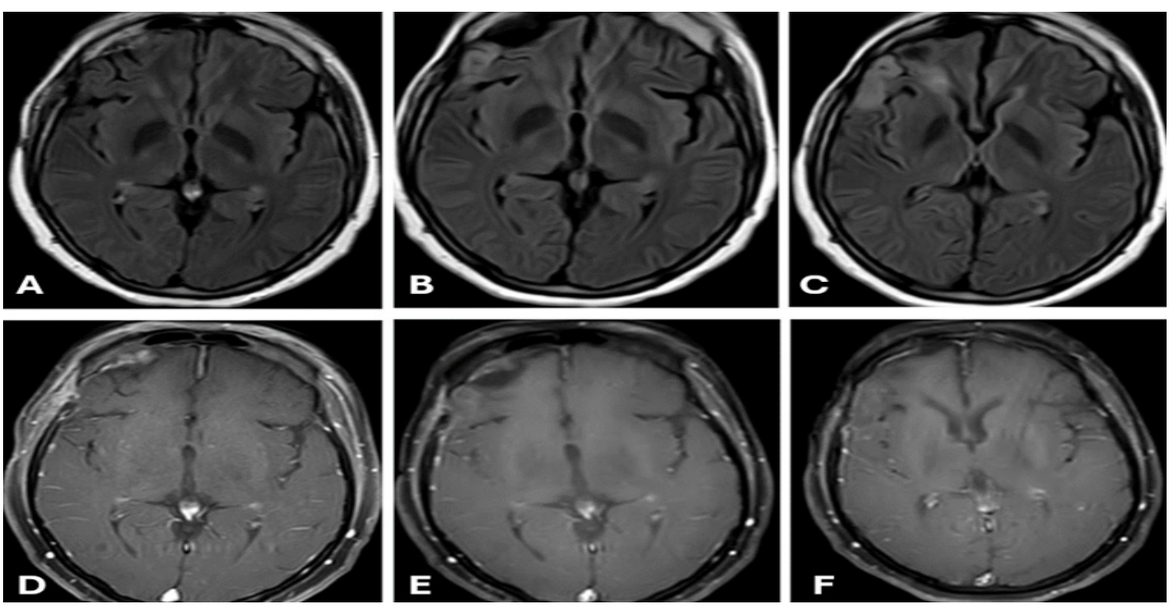

Fig. 3: Known case of astrocytoma grade 3 submitted to surgical intervention and radiotherapy; (A) axial FLAIR six months after treatment showed stationary imaging findings to three months follow up, while (B) and (C) axial FLAIR 12-months after treatment showed worsening in the imaging findings with newly appearing signal in FLAIR just below the original tumor site with positive mass effect in the form of gyral expansion, (D) six-months axial CE T1 WIs follow up showing no enhancing lesions. At the same time, there are newly appearing faint post-contrast enhancements in axial CE T1 WIs (E) and (F) done 12 months after treatment (BT-RADS 3C) with evident positive tumor progression by histopathology.

The advancement of the tumor and the BT-RADS criteria, such as enhancement, FLAIR, and mass effect, as well as the BT-RADS at three and six months, showed a highly statistically significant relationship (*P value*<0.01). There was highly statistically significant relation between tumor progression and BT-RADS scores at 3 and 6 months with *P value*<0.01 (Table 1), and (Table 2). By studying the rate of TP in brain glioma in each category of the BT-RADS scoring system at 3 months in comparison to the patient's outcome, the incidence of TP increased with increasing the BT-RADS category among our patients. No detectable tumor progression was found among patients categorized as 1a, the rate of TP for Category 2 was 12.9% (4/30), Category 3a was 33% (1/3), Category 3b was 66.6% (2/3), Category 3c was 66.6% (6/9) and in Category 4 was 100% (5/5). Focusing on BT-RADS 3 which is pivotal in the likelihood of tumor progression; the rate of TP among our patients categorized with BT-RADS 3 was 33% (1/3) for BT-RDAS 3a, 66.7% (2/3) for BT-RADS 3b, and 75% (6/8) for BT-RADS 3c.

Table 1: Relation between the findings of the main BT-RADS criteria of the studied patients at 3 months using the 12-month follow-up as the gold standard of reference.

		Tumor progression at 12 months				Test value*	*P-value*	Sig.
		Negative		Positive				
		No.	%	No.	%			
Enhancement	Decreased	3	8.3%	1	5.6%	24.358	0.000	HS
	Stationary	30	83.3%	4	22.2%			
	Increased within CRT	3	8.3%	10	55.6%			
	New lesion	0	0.0%	3	16.7%			
FLAIR	Decreased	0	0.0%	0	0.0%	21.683	0.000	HS
	Stationary	32	88.9%	5	27.8%			
	Increased within CRT	4	11.1%	10	55.6%			
	New lesion	0	0.0%	3	16.7%			
Mass effect	Decreased	0	0.0%	0	0.0%	21.683	0.000	HS
	Stationary	32	88.9%	5	27.8%			
	Increased within CRT	4	11.1%	10	55.6%			
	New lesion	0	0.0%	3	16.7%			
Clinical status	Stable	32	88.9%	4	22.2%	24.000	0.000	HS
	Worse	4	11.1%	14	77.8%			

P> 0.05: Non-significant (NS); *P* <0.05: Significant (S); *P*<0.01: Highly significant (HS); *: Chi-square test

Table 2: Relation between the findings of the main BT-RADS criteria of the studied patients at 6 months and the presence of tumor progression/ patients' outcome at 12 months as a gold standard.

		Tumor progression at 12 months				Test value*	*P-value*	Sig.
		Negative		Positive				
		No.	%	No.	%			
Enhancement	Negative	33	91.7%	5	27.8%	23.492	0.000	HS
	Positive	3	8.3%	13	72.2%			
FLAIR	Negative	32	88.9%	5	27.8%	20.776	0.000	HS
	Positive	4	11.1%	13	72.2%			
Mass effect	Negative	32	88.9%	5	27.8%	20.776	0.000	HS
	Positive	4	11.1%	13	72.2%			
BT-RADS 3 months	Negative	32	88.9%	5	27.8%	20.776	0.000	HS
	Positive	4	11.1%	13	72.2%			
BT-RADS 6 months	Negative	34	94.4%	4	22.2%	30.020	0.000	HS
	Positive	2	5.6%	14	77.8%			

P> 0.05: Non-significant (NS); *P* <0.05: Significant (S); *P*<0.01: Highly significant (HS); *: Chi-square test.

The BT-RADS score at 6 months had the highest specificity and sensitivity for detection of tumor progression/ regression at 12 months. Among the individual criteria constituting the BT-RADS; enhancement features showed the highest specificity for detection of tumor progression/ regression with a specificity of 91.7% and accuracy of 85.2% while FLAIR and mass Effect, both of which exhibited an AUC of 0.806 (95% CI: 0.675 to 0.901), with a sensitivity of 72.2%, a specificity of 88.9%, a PPV of 76.5%, an NPV of 86.5%, and an accuracy of 83.3%. Overall, the individual criteria specificity is higher than their sensitivity in detection of tumor progression or non-progression (Table 3) (Figure 4). Among the 54 patients evaluated, pseudo-response was observed in a single case (1.8 %) (Figure 5), whereas pseudo-progression was documented in four cases (7.4 %).

Table 3: Diagnostic performance of BT-RADS criteria and BT-RADS score at 3 months and at 6 months in reference to tumor progression/ patients' outcome at 12 months (Gold standard).

	Enhancement	Flair	Mass effect	BT-RADs 3 months	BT-RADs 6 months
TP	13	13	13	13	14
TN	33	32	32	32	34
FP	3	4	4	4	4
FN	5	5	5	5	2
Sensitivity	72.2 (46.5 - 90.3)	72.2 (46.5 - 90.3)	72.2 (46.5 - 90.3)	72.2 (46.5 - 90.3)	77.8 (52.4 - 93.6)
Specificity	91.7 (77.5 - 98.2)	88.9 (73.9 - 96.9)	88.9 (73.9 - 96.9)	88.9 (73.9 - 96.9)	94.4 (81.3 - 99.3)
PPV	81.3 (54.4 - 96.0)	76.5 (50.1 - 93.2)	76.5 (50.1 - 93.2)	76.5 (50.1 - 93.2)	87.5 (61.7 - 98.4)
NPV	94.3 (71.9 - 95.6)	86.5 (71.2 - 95.5)	86.5 (71.2 - 95.5)	86.5 (71.2 - 95.5)	89.5 (75.2 - 97.1)
Accuracy	85.2	83.3	83.3	83.3	88.9
AUC	0.819 (0.691 to 0.911)	0.806 (0.675 to 0.901)	0.806 (0.675 to 0.901)	0.806 (0.675 to 0.901)	0.861 (0.740 to 0.940)

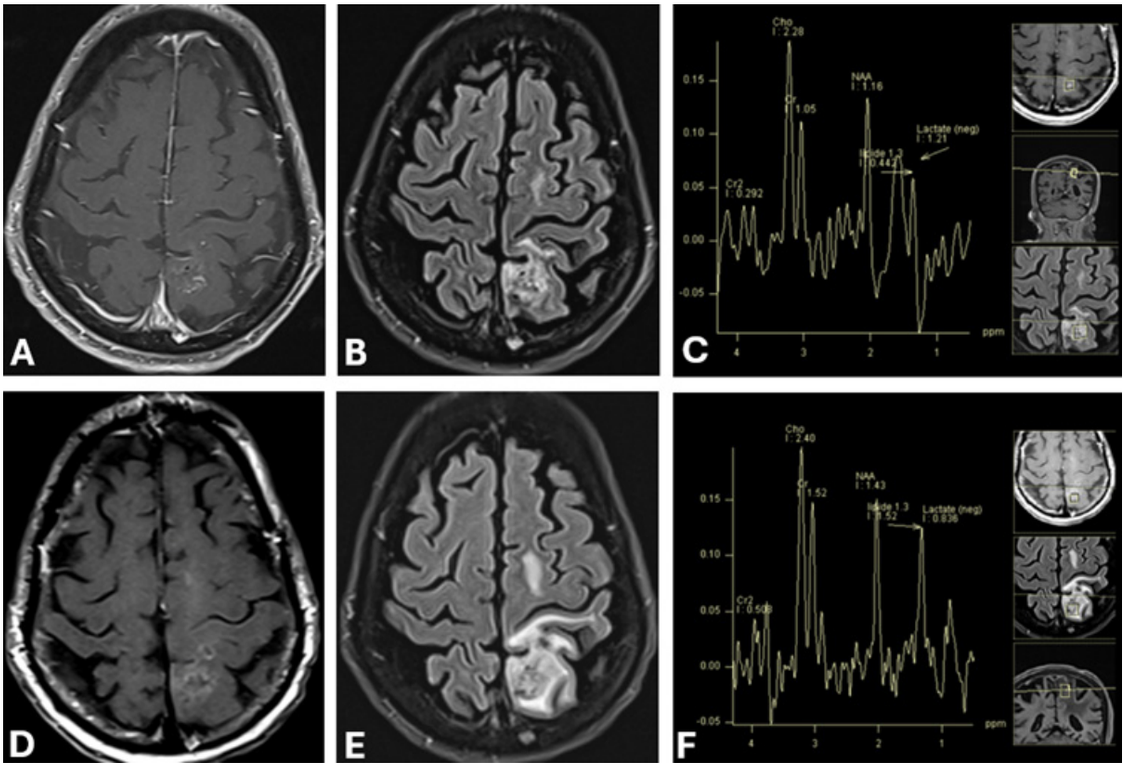

Fig. 4: Follow-up CE MRI brain and MR spectroscopy at 3 months (A, B, C) and 6 months (D, E, F) after treatment for a known case of left parietal glioma grade 3 with a history of Avastin treatment. The three-month follow-up axial CE T1 WIs (A) and axial FLAIR (B) showed regression in the extent of the perilesional edema appearing just mild with regression in the post-contrast heterogeneous enhancement. The six-month follow-up axial CE T1 WIs (D) and axial FLAIR (E) showed progression in the extent of the perilesional edema appearing just mild with progression in the post-contrast heterogeneous enhancement. This case was confirmed at the 12-month follow-up to be positive for tumor progression. MR spectroscopy was done for this patient at 3 months (C) and 6 months (F). The 3 months follow up showed Cho/NAA ratio of 2 and a Cho/creat ratio of 2.2 while at 6 months the Cho/NAA ratio was 1.7 and Cho/creat ratio was 1.6 at three months denoting pseudo response of the morphological imaging regression at the 3 months follow up scan.

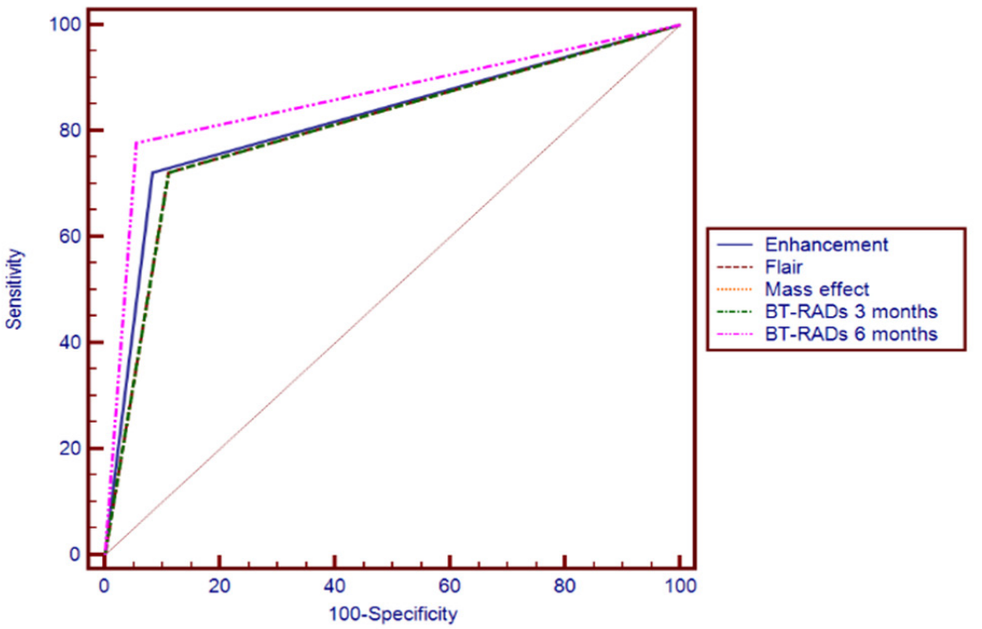

Fig. 5: Receiver operating characteristic curve (ROC) for the diagnostic accuracy of main BT-RADS criterion including (Enhancement, FLAIR and mass effects) and BT-RADS score at 3 months and at 6 months in predicting tumor progression/ patients' outcome at 12 months.

No detectable tumor progression was found among patients categorized as 1a, the rate of TP for Category 2 was 12.9% (4/30), Category 3a was 33% (1/3), Category 3b was 66.6% (2/3), Category 3c was 66.6% (6/9) and in Category 4 was 100% (5/5). Focusing on BT-RADS 3 which is pivotal in the likelihood of tumor progression; the rate of TP among our patients categorized with BT-RADS 3 was 33% (1/3) for BT-RDAS 3a, 66.7% (2/3) for BT-RADS 3b, and 75% (6/8) for BT-RADS 3c.

DISCUSSION

In order to guide brain tumor care and optimize treatment planning to improve patient outcomes, imaging plays a critical role in evaluating treated brain glioma and distinguishing post-treatment alterations from remaining or progressing tumors. BT-RADS (Brain Tumor Reporting and Data System) was created for glioma surveillance to streamline and standardize the MRI reporting of brain tumors following therapy. Like the well-known BI-RADS system, it assigns a numerical category from 0 to 4 that indicates the likelihood of tumor progression (TP). Every category has a management decision associated with it. Changes in four MRI imaging patterns, enhancing components, FLAIR components, mass effects, and the presence of new lesions as compared to the most recent previous brain MRI constitute the basis for the classification[8].

In the current study, we applied the BT-RADS scoring system to 54 patients with different grades of brain glioma to evaluate its diagnostic performance in distinguishing tumor progression from regression. We considered BT-RADS 3a as the cut off value with BT-RADS score >3a which means that BT-RADS score 3b, 3c, and 4 are considered positive for tumour progression. By studying the rate of TP in brain glioma in each category of the BT-RADS scoring system at 3 months in comparison to the patient's outcome, the incidence of TP increased with increasing the BT-RADS category among our patients except for BT-RADS 1 category, and this could be explained by the small number of the patients falling in this category rather than the actual high recurrence rate. No detectable tumor progression was found among patients categorized as 1a, the rate of TP for Category 2 was 12.9% (4/30), Category 3a was 33% (1/3), Category 3b was 66.6% (2/3), Category 3c was 66.6% (6/9) and in Category 4 was 100% (5/5). Focusing on BT-RADS 3 which is pivotal in the likelihood of tumor progression; the rate of TP among our patients categorized with BT-RADS 3 was 33% (1/3) for BT-RDAS 3a, 66.7% (2/3) for BT-RADS 3b, and 75% (6/8) for BT-RADS 3c. These results agree with ***Yang et al.*** who found a recurrence rate of 21% (6/28) for BT-RADS Category 3a, 61.5% (16/26) for Category 3b, and 78.4% (29/37) for Category 3c[9].

In our study, we found that four patients out of 54 patients (7.4%) showed the phenomenon of pseudo-progression, characterized by the presence of increased or new contrast enhancing within the field of radiation and perilesional edema on FLAIR in the first three to six months and resolve spontaneously without modifying therapy. Pseudoprogression differs from radionecrosis which represents a late disease occurring 18-24 months up to many years after treatment[10, 11]. Among the four

patients displaying pseudo-progression, three had high-grade glioma, while one had a low-grade glioma. Notably, there was no significant statistical correlation between demographic factors or tumor characteristics and the occurrence of pseudo-progression in the studied patients. The only common factor associated with the patients who experienced pseudo-progression was exposure to chemo-radiotherapy. The transitory radiation effect on the vasculature, which causes vasodilatation, edema, and enhanced capillary permeability, could be the cause of the brief increase in contrast enhancement and perilesional edema on FLAIR observed in pseudo-progression[12].

Because vascular proliferation is recognized to be a feature of tumor progression, some studies have proposed a further characterization of genuine progression and pseudo-progression by combining DWI and perfusion MR imaging[13]. In this context, the updated guidelines of the Congress of Neurological Surgeons regarding the management of GBM recommended the use of MRI with and without gadolinium enhancement in addition to DWI, MRS, and perfusion to differentiate TP from pseudo response[14]. One patient out of the 54 studied patients (1.8%) showed pseudo-response in the form of decreased enhancement, edema on FLAIR, and mass effects followed by progression in the latter follow-up scans. This male patient had a grade III astrocytoma that was surgically removed and treated with chemoradiotherapy that included anti-vascular endothelial growth factor (anti-VEGF) medications. Anti-VEGF drugs are used to treat high-grade gliomas. These substances cause the blood-brain barrier to "normalize," sometimes in a matter of hours. The degree of enhancement caused by the tumor and surrounding edema on FLAIR is reduced throughout imaging. The term "pseudo-response" refers to an imaging pattern that mimics a positive response to treatment but is really caused by changes in vascular permeability rather than tumor reduction. Neuroradiologists should therefore exercise caution and be aware of the treatment they have undergone[15].

Our finding that BT-RADS assessment at 6 months post-treatment outperforms the 3-month assessment in diagnostic accuracy is supported by emerging evidence on post-therapy glioma imaging. Early post-therapy MRI can be confounded by transient treatment effects, whereas later follow-up more reliably reflects true tumor status. For instance, a recent analysis of glioblastoma patients by ***Persico et al.,***[16] found that a BT-RADS score obtained at 3 months after chemoradiation had only modest prognostic discrimination (in multivariate analysis, AUC of 0.65 for predicting 1-year functional outcome. In contrast, the BT-RADS score at 6 months added significant predictive value: patients with “low” BT-RADS (0–3a) at 6 months had a substantially lower risk of progression than those with higher scores. This suggests improved diagnostic performance at the later time point. Consistently, ***Trivedi et al.,***[17] reported that patients whose scans stayed at BT-RADS ≤3a (indicating no significant early progression) had markedly better 12-month survival 94.8% (95% CI: 89.9-99.8), than those reaching BT-RADS ≥3b by that time 31.5% (95% CI: 4.0-59.0). In other words, signs of progression evident beyond 3 months were strongly prognostic of true recurrence and worse outcomes, whereas many early imaging changes did not portend poor survival. This aligns with our observation that a 6-month BT-RADS evaluation is more accurate: early progression-like changes often represent pseudoprogression that later stabilizes or regresses, whereas progression seen at 6 months is more likely genuine[17].

In our cohort the enhancing component alone yielded an AUC of 0.819 (95 % CI 0.691–0.911), 72.2 % sensitivity and 91.7 % specificity, clearly outperforming FLAIR and mass-effect and driving an overall accuracy of 85.2 %. A very similar dominance of enhancement has been reported by ***Metwally et al.***,[18] in a prospective pilot of BT-RADS-3 lesions: their baseline BT-RADS achieved only AUC 0.706, but when diffusion-weighted imaging and cavity-FLAIR were added, the AUC climbed to 0.819, underscoring that enhancement-centred information provides most of the discriminative power. A large multi-institutional validation by ***Almalki et al.***,[19] confirmed this pattern; using a cut-off of >BT-RADS-3a—which is primarily triggered by new or enlarging contrast enhancement—they obtained sensitivities of 68.6–85.7 %, specificities of 84.2–92.1 % and accuracies of 78.1–86.3 %, essentially overlapping the 85.2 % accuracy we observed with enhancement alone. A recent narrative review by Parillo & Quattrocchi,[20] synthesised these studies and concluded that “escalation of enhancement remains the single strongest driver of BT-RADS category upgrading”, with FLAIR and mass-effect contributing incremental, but smaller, gains. The robust correlation we found between rising composite BT-RADS scores, and objective tumour growth ($P < 0.01$) mirrors the stepwise increase in true-progression rates reported by both Almalki and Yang, reinforcing the biological validity of enhancement-centred score escalation. Collectively, these external data validate—and in some aspects benchmark—the superior diagnostic performance of the enhancement component observed in our study, while highlighting that advanced diffusion or perfusion metrics mainly serve to augment, rather than replace, its central role.

LIMITATIONS OF THIS STUDY

this study is limited by being a single-center retrospective study and limited by the number of the studied population, so we recommend further prospective multi-centric studies with a large sample size to better assess and modify the BT-RADS scoring.

CONCLUSION

The BT-RADS scoring system has a high diagnostic performance in the prediction of the tumour progression/

regression at the 12-month follow-up and thus, may help in improving the management of patients with brain glioma.

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None

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الاداء التشخيصى للمُصَوِّرُ الشُعاعِيّ لاورام المخ فى مراقبة ما بعد العلاج لأورام المخ الدبقي

منار مأمون عاشور، ايمان محمد كمال و مها عبد المجيد الشناوي

قسم الأشعة التشخيصية، كلية الطب، جامعة عين شمس

المقدمة: يهدف استخدام نظم التقارير المنظمة إلى إحداث ثورة في دور الأشعة التشخيصية في تحسين معالجة المرضى من خلال التقدم فى وضوح تفسير الصور وتوحيد مصطلحات التقارير، وأيضا شرح خطوات المعالجة المرتبطة بمجموع من النقاط وذلك من خلال المُصَوِّرُالشُعاعِيّ لاورام المخ.

الهدف من الدراسة: هو تقييم قيمة المُصَوِّرُالشُعاعِيّ لاورام المخ في متابعة التصوير بعد العلاج للمرضى المصابين بأورام الدماغ الدبقية.

المرضى وطريقة البحث: أُجريت هذه الدراسة الاستباقية حيث شملت اربعة وخمسون مريض من المرضى المصابين بأورام المخ الدبقيةً الذين خضعوا لفحوصات الرنين المغناطيسى المتتابعة على مدار اثني عشر شهرًا. تم تحليل وتفسير الظواهر الاشعاعية التي شملت التباين بالصبغة، استعادة الانعكاس المخفف للسوائل وتأثير الكتلة من خلال قائمة اختيار وتحديد درجة المُصَوِّرُالشُعاعِيّ لاورام المخ. وقد قارنت هذه الدراسة دقة الأداء التشخيصي لهذا المُصَوِّرُ عند متابعة ما بعد العلاج بثلاثة شهور وستة أشهر في القدرة على التنبؤ بتطور الورم أو عدمه استنادا الى المتابعة عند إثني عشرة شهراً كمقياس مرجعى ذهبى.

النتائج: اظهر استخدام المصور الشعاعي لأورام المخ عند ستة أشهر بعد العلاج أداء تشخيصي اعلى من مثله عند ثلاثة اشهر في التنبؤ بناتج المريض النهائي بحساسية ٧٧,٨٪ مقارنة بحساسية ٧٢,٢٪، وخصوصية ٩٤,٤٪ مقارنة بخصوصية ٨٨,٩ ٪ .ومن بين معايير التصوير بالرنين المغناطيسي المشمولة في هذا النظام، أظهر تقييم تباين بالصبغة أعلى أداء تشخيصي بحساسية ٧٢,٢٪، وخصوصية ٩١,٧٪.

الاستنتاج: يعطى استخدام المُصَوِّرُالشُعاعِيّ لاورام المخ أداءً تشخيصيًا عاليًا في التنبؤ بنتائج العلاج خلال فترة المتابعة التي استمرت ١٢ شهرًا. ولهذا يوصي باستخدامه في فحوصات المتابعة لأورام المخ الدبقية.