

Global treatment landscape of primary IDH-mutant astrocytoma CNS-WHO grade 4 –results from the international study group on IDH-mutant glioma (IM4) [Abstract]

Naureen Keric, Harald Krenzlin, Alexander A. Aabedi, Hajrullah Ahmeti, Serena Ammendola, Beat Alessandri, Fadi Al-Tarawni, Jürgen Beck, Mitchel S. Berger, Michaël Bruneau, Giovanni Carone, Hans Clusmann, Massimiliano Del Bene, Francesco DiMeco, Johnny Duerinck, Nikolaos Foroglou, Roland Goldbrunner, Cristina Gómez-Revuelta, Pablo Gonzalez-Lopez, Hanna Gött, Raphael Guzman, Levin Häni, Hussam A. Hamou, Patrick Harter, Shawn L. Hervey-Jumper, Sebastian Ille, Asgeir S. Jakola, Kerstin Jütten, Philipp Karschnia, Evangelos Kogias, Aleksandrs Krigers, Sandro Krieg, Enrico Kuellenberg, Valentina Lakusta, Jan Leppert, Severina Leu, Anna Lipatnikova, Aaron Lawson McLean, Dorothee Mielke, Dorothea Miller, Vesna Malinova, Hanno S. Meyer, Bernhard Meyer, Anna-Laura Potthoff, Andreas Raabe, Mirjam Renovanz, Laurèl Rauschenbach, Constantin Roder, Veit Rohde, Francesco Sala, I. Erol Sandalcioğlu, Karl Schaller, Leon Schmidt, Matthias Schneider, Oliver Schnell, Christian Senft, Matthias Simon, Björn Sommer, Klaus-Peter Stein, Veit Stöcklein, Marco Timmer, Niklas Thon, Claudius Thomé, Ulrich Sure, Michael Synowitz, Hartmut Vatter, Barbara Vukic, Arthur Wagner, Jacob S. Young, Florian Ringel

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interplay.

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Session 9: Glioma & Low Grade Glioma, October 1, 2026, 9:30 AM - 10:30 AM

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Relationship between Lesion Overlap in White Matter Tracts and Depressive Symptoms in Glioblastoma Patients

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In glioblastoma patients, major depressive symptoms are a common and debilitating comorbidity. While previous research has focused mainly on tumor localization in cortical areas, the role of white matter tract involvement in the manifestation of depressive symptoms remains insufficiently understood. This study aimed to investigate whether lesion overlap with specific white matter tracts correlates with preoperative depressive symptom burden.

Methods: Data from 215 glioblastoma patients of a multicenter study were analyzed. Preoperative depressive symptoms were assessed using the Beck Depression Inventory (BDI). Lesion and peritumoral edema volumes were segmented and normalized. Lesion overlap volumes (LOV) were calculated atlas-based for bilateral white matter tracts. Kendall's Tau correlations (FDR-corrected) were computed between BDI scores and tract-specific LOV. Additionally, we report two illustrative cases with left temporal lesions.

Results: The mean BDI score was 7.16 ± 5.89 . 14.4% ($n = 32$) of patients were classified as depressed ($BDI \geq 14$), while 187 patients (85.6%) were regarded non-depressed. No gender effects were observed. Left-sided lesion location was associated with higher BDI scores. Significant correlations between LOV and BDI scores were found for the arcuate fasciculus (left AF; $\tau = -0.128$, $p = 0.0245$), inferior longitudinal fasciculus (left ILF; $\tau = -0.125$, $p = 0.0248$), the middle longitudinal fasciculus (left MdLF; $\tau = -0.140$, $p = 0.0245$), and the superior longitudinal fasciculus III (left SLF3; $\tau = -0.131$, $p = 0.0245$). The clinical cases illustrate the substantial effect of resection-related left ventral stream lesions on mood, heavily affecting daily living activities and social interactions.

Conclusions: Taken together, the findings suggest a lateralized association between structural damage to white matter tracts and mood and identifies the left ventral stream as a key player. The underlying network dynamics are worthy of being further investigated to improve surgical planning and inform targeted neuromodulation strategies.

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Global treatment landscape of primary IDH-mutant astrocytoma CNS-WHO grade 4 – Results from the International Study group on IDH-mutant glioma (IM4)

Naureen Keric¹, Harald Krenzlin^{1,2}, Alexander A. Aabedi³, Hajrullah Ahmeti⁴, Serena Ammendola⁵, Beat Alessandri², Fadi Al-Tarawni⁶, Jürgen Beck⁷, Mitchel S. Berger³, Michaël Bruneau^{8,9}, Giovanni Carone¹⁰, Hans Clusmann¹¹, Massimiliano Del Bene¹⁰, Francesco DiMeco^{10,12,13}, Johnny Duerinck^{8,9}, Nikolaos Foroglou¹⁴, Roland Goldbrunner¹⁵, Cristina Gómez-Revuelta¹⁶, Pablo Gonzalez-Lopez¹⁶, Hanna Gött¹⁷, Raphael Guzman¹⁸, Levin Häni¹⁹, Hussam Aldin Hamou¹¹, Patrick Harter²⁰, Shawn L. Hervey-Jumper³, Sebastian Ille^{21,22}, Asgeir S. Jakola^{23,24}, Kerstin Jütten¹¹, Philipp Karschnia²⁵, Evangelos Kogias¹⁴, Aleksands Krigers²⁶, Sandro Krieg^{21,22}, Enrico Kuellenberg⁷,

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The 2021 WHO CNS 5 classification emphasizes the central role of isocitrate dehydrogenase (IDH) status in diffuse gliomas. Tumors formerly classified as IDH-mutant (mut) glioblastoma WHO grade IV are reclassified as IDH-mut astrocytoma, CNS WHO grade 4. The clinical course and optimal management of this new entity remain incompletely understood. Outcomes and treatment patterns were analyzed in the largest international cohort today.

Methods: A multicenter retrospective study across 31 international university hospitals included adult patients diagnosed between 2013 and 2022 with primary IDH-mut glioblastoma WHO grade IV or IDH-mut astrocytoma CNS WHO grade 4. Clinical, molecular, and treatment-related data were collected.

Results: A total of 440 patients with IDH-mut astrocytoma/glioblastoma (CNS WHO grade 4) were included (41.3% female; mean age 44.7 years). Median PFS was 28.4 month (95CI 28.9-35.0) and median OS 73.7 month (95CI 65.8-89.5). Survival was independent from MGMT methylation (meth.: 79.5 months; unmeth.: 69.8 months; $P = .303$). Age ≥ 65 ($P < .0001$), partial or homozygous CDKN2A/B deletion ($P = .018$) and retained ATRX ($P = .031$) were independent negative predictors of survival on univariate analysis. In multivariate analyses age (HR: 1.21 (1.01–1.04); $P = .013$), EOR (HR: 0.36 (0.11–1.08); $P = .029$) and ECOG > 1 (HR: 2.36 (0.78–5.90); $P = .04$) remained predictors of survival.

Progression was detected in 257 patients (62.1%). First line therapy included resection and radiochemotherapy in 325 (78.5) of all patients. Class 1 (OS: 79.5 (95CI 68.6-101.0)) and 2 (OS: 86.7 (95CI 61.4-inf)) resection was superior to Class 3 (OS: 56.0 (95CI 33.2-inf)) and 4 (OS: 23.5 (95CI 4.0-56.0)) ($P = .004$). The addition of lomustine to radiochemotherapy with temozolomide was not superior ($P = .933$).

After recurrence, re-resection (OS: 25.3 months (95CI 15.6-36.3); $P = .027$), chemotherapy (OS: 27.1 months (95CI 17.2-34.1); $P = .0001$) and multimodal therapy (OS: 21.6 months (95CI 12.2-31.1); $P = .0002$) improved survival compared to radiation alone or best supportive care.

Conclusions: IDH-mut astrocytoma CNS WHO grade 4 represents a distinct tumor entity with largely consistent treatment approaches across international centers. Maximal safe resection is a key determinant of outcome, even when gross total resection is not achievable, while intensified alkylating chemotherapy does not seem to improve survival. These results provide a guideline for clinical decision making.

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Session 17: Degenerative Cervical Myelopathy, October 1, 2026, 11:00 AM - 12:30 PM

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A Simple Clinical Score for Early Identification of Degenerative Cervical Myelopathy: Results of the Prospective Multicenter SCREEN-DCM Trial

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Degenerative cervical myelopathy (DCM) is the most common cause of spinal cord dysfunction worldwide, yet it remains frequently underdiagnosed. Early identification is crucial to prevent irreversible disability. The SCREEN-DCM study proposes a simple score based on clinical signs, with a threshold of ≥ 3 points recommending cervical MRI due to high suspicion of DCM.

Methods: SCREEN-DCM is a multicenter prospective study, in this analysis, we included all patients who underwent cervical MRI, regardless of whether it was formally indicated by their score (≥ 3 or < 3). The outcome was a confirmed diagnosis of DCM, candidate clinical predictors were entered into a multivariable logistic regression model. Stepwise elimination based on the Akaike Information Criterion identified the eight most relevant predictors to reduce overfitting. Model performance was assessed using the area under the receiver operating characteristic (ROC) curve

Results: In total, 199 patients were screened: 68 (34%) screened positive (score ≥ 3), and 131 (66%) screened negative (score < 3). In total, 81 patients ultimately underwent MRI, of these, 55 belonged to the positive group, while 26 had a negative screening but underwent MRI for other clinical reasons. Within the 55 positive patients, 28 were diagnosed with DCM (PPV=50.9%, Number Needed to Diagnose=1.96). 1 of the 26 patients with a score < 3 had DCM (NPV=96.2%). Hoffmann's sign (OR=22.35; $p < 0.001$), gait ataxia (OR=13.80; $p = 0.005$) and hand clumsiness (OR=6.28; $p = 0.019$) emerged as the strongest independent predictors. The reduced model demonstrated excellent discrimination (AUC=0.885; 95% CI 0.81-0.96).

Conclusions: The SCREEN-DCM score is a robust tool for early DCM detection, effectively ruling out disease in screen-negative patients and optimizing resource allocation by requiring only 2 MRIs to confirm 1 DCM diagnosis. Further analyses focusing on high-risk subgroups may help refine the score and enhance its precision in specific populations. Implementing this score in clinical care could reduce diagnostic latency and improve patient outcomes.

Optional Image

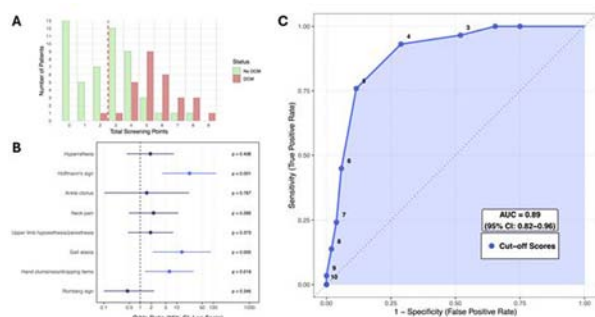


Figure 1: Performance of the SCREEN-DCM score. (A) Distribution of total screening scores according to DCM status. (B) Multivariate logistic regression analysis of the reduced 8-variable model. (C) ROC curve of the reduced 8-variable model.

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Session 17: Degenerative Cervical Myelopathy, October 1, 2026, 11:00 AM - 12:30 PM

Brain and Spine 6 (2026) 106727

Pazopanib improves functional recovery and tissue preservation after experimental spinal cord injury in rats

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Traumatic spinal cord injury (SCI) causes persistent neurological deficits driven by secondary injury mechanisms including neuroinflammation, gliosis, and vascular disruption. Effective pharmacological strategies targeting early secondary damage remain limited. This study evaluated whether the multi-target tyrosine kinase inhibitor Pazopanib improves functional and structural outcomes following experimental SCI.

Methods: A T9 contusion-compression SCI model was established in Wistar rats ($n = 176$). Animals received intraperitoneal Pazopanib (20 mg/kg) or saline at 3.5 and 12.5 hours post-injury. Functional recovery was assessed using Basso, Beattie and Bresnahan (BBB) scoring and CatWalk gait analysis up to 28 days post-injury (dpi). MRI at 3, 7, and 28 dpi evaluated lesion-associated structural changes. Early signaling responses were examined using phosphorylated receptor tyrosine kinase profiling at 1 dpi. Immunofluorescence at 3 and 28 dpi assessed neuroinflammation, astrogliosis, neuronal survival, oligodendrocyte preservation, and vascular morphology.

Results: Pazopanib significantly improved locomotor recovery beginning at 7 dpi, with higher BBB scores at later time points compared with controls ($p < 0.05$). CatWalk analysis showed improved hindlimb coordination and gait parameters, including increased stride length and reduced paw placement variability ($p < 0.05$). MRI analyses demonstrated comparable edema volume and T2 signal evolution between groups at all time points. Early RTK profiling did not reveal significant global phosphorylation changes. Histological analyses showed reduced microglial activation and astrogliosis with smaller cystic cavity formation (36.74% vs. 26.48%, $p < 0.05$). Pazopanib was associated with enhanced neuronal preservation (175.28 vs. 127.09 cells/mm², $p < 0.05$), improved oligodendrocyte survival and remyelination, and partial preservation of vascular morphology.

Conclusions: Pazopanib promotes functional recovery and attenuates secondary tissue damage after SCI despite the absence of detectable early RTK signaling or macroscopic edema changes, suggesting neuroprotection mediated through modulation of cellular injury responses and tissue remodeling.

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Oral e-Poster Presentations 2 - Booth 4, October 1, 2026, 1:00 PM - 2:00 PM

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Accuracy and Efficiency of Automated Pedicle Screw Planning – A Comparative Study

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Background: The navigation of pedicle screws is a clinical standard. Often, screws must be planned in advance using software. Automatic pre-planning can significantly facilitate this work. The aim of this study was to compare automated planning (AP) versus manual freehand (FH) planning regarding time and