Results and conclusions: Histopathology showed a grade 3 astrocytoma, IHC negative for IDH1, p53, and H3K27M but demonstrating ATRX loss. Sequencing confirmed wildtype status for *IDH1/2* and *H3F3A* and showed an unusual combination of mutated genes (*ATRX*, *NF1* and *RAF1*) and *CDKN2A* deletion. *ATRX* and *NF1* mutations typically show a high degree of mutual exclusivity in astrocytomas (cBioPortal <http://cbioportal.org>). The currently described case has a very similar molecular profile to a recently reported series of the so-called 'anaplastic astrocytoma with piloid features',¹ which is yet to be included in the WHO classification of CNS tumours, and has a unique methylation profile and clinical outcome.

Reference

1. Reinhardt A, Stichel D, Schrimpf D, *et al.* Anaplastic astrocytoma with piloid features, a novel molecular class of IDH wildtype glioma with recurrent MAPK pathway, *CDKN2A/B* and *ATRX* alterations. *Acta Neuropathol* 2018; 136: 273–91.

52. FGFR3-TACC3: CASE REPORT AND REVIEW OF A POTENTIALLY TARGETABLE DIAGNOSTIC MARKER IN HIGH GRADE GLIOMAS

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Background: *FGFR3-TACC3* fusion has been identified in IDH wild-type WHO grade III and IV astrocytomas, with an incidence of 2–3% in most case series and a range of 1–8%. These tumours have characteristic histopathological features and a poor prognosis. The aberrant CD34 immunohistochemical staining and glial and neuronal marker co-expression may lead to a misdiagnosis of a glioneuronal tumour with a better prognosis. An immunohistochemistry antibody to *FGFR3* is commercially available which may serve as a more cost-effective screening test for identification of possible *FGFR3-TACC3* cases. These tumours may also be amenable to treatment by *FGFR* tyrosine kinase inhibitors, or through inhibition of oxidative phosphorylation as a down-stream functional target of *FGFR3-TACC3* fusion.

Aims: A report highlighting common pitfalls in the diagnosis of high grade astrocytoma with *FGFR3-TACC3* gene fusion.

Methods: A single case study and review of the supporting literature.

Results and conclusions: A 64-year-old male with a four month history of focal sensory abnormalities had a solitary 24 mm, intra-axial, contrast-enhancing left parietal lobe brain lesion on MRI. A stereotactic craniotomy and tumour resection was performed. Histopathology showed a malignant heterogeneous tumour. The cellular morphology included gemistocytic features, larger pleomorphic cells and numerous mitotic figures. Additional findings were psammomatous calcifications and thin-walled branching blood vessels with perivascular lymphoid cuffing. Many of the lesional cells co-expressed neuronal and glial protein markers on immunohistochemistry and there was also patchy aberrant CD34 staining. *IDH1*, *IDH2* and *BRAF* genes were wild-type on molecular pathology testing. There was no loss of chromosome 1p or 19q or *EGFR* amplification by cytogenetic analysis. The Illumina TP170 next-generation sequencing assay identified a *FGFR3-TACC3* gene fusion, a *TERT* promoter mutation (C250T) and a gain of *FGFR3*. The

diagnosis of anaplastic astrocytoma, WHO grade III, IDH wild-type with *FGFR3-TACC3* fusion, *TERT* promoter mutation and *FGFR3* gain was made.

53. A CASE OF EMBRYONAL TUMOUR WITH MULTILAYERED ROSETTES, C19MC-ALTERED

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Background: Embryonal tumour with multilayered rosettes, C19MC-altered (ETMR, C19MC-altered) is a rare, aggressive central nervous system embryonal tumour with alterations including amplifications and fusions in the C19MC locus.¹ C19MC is a microRNA cluster thought to be involved in regulating gene expression, and C19MC microRNA expression is increased in ETMR, C19MC-altered. ETMR, C19MC-altered is a new entity in the WHO Classification of Tumours of the Central Nervous System, revised 4th edition. A new feature of this edition is the integration of molecular genotype, as well as histological and immunohistochemical characteristics, into the diagnostic criteria for several tumours, including ETMR, C19MC-altered.¹ We present a case of ETMR, C19MC-altered. **Aims:** The aim was to determine the histological and molecular type of tumour resected from the left frontal lobe of the patient, a 2 year old female.

Methods: Histology, immunohistochemistry and molecular karyotyping were performed on a sample from the tumour.

Results and conclusions: Histology showed a tumour composed of cells with small to intermediate-sized nuclei and coarse chromatin in a fibrillary background. Multilayered rosettes and occasional neoplastic ganglion cells were present. Immunohistochemically, the neuropil component stained for vimentin and synaptophysin, with patchy staining for Neuro T. The small cells showed retained INI1 staining, focal staining with LIN28 and CD99 staining in occasional cells. NeuN highlighted neoplastic ganglion cells. The Ki-67 index was up to 23%. Molecular karyotyping showed C19MC alteration, and copy number changes for chromosomes 2, 4, 19 and 17. ETMR, C19MC-altered was diagnosed.

Reference

1. Louis DN, Ohgaki H, Wiestler OD, *et al.*, editors. *WHO Classification of Tumours of the Central Nervous System*. Revised 4th ed. Lyon: IARC, 2016; 201–5.

54. TOWARDS BETTER CHARACTERISATION OF MOLECULAR ALTERATIONS IN GLIONEURONAL TUMOURS

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Background: Glioneuronal tumours constitute a subtype of brain tumour characterised by neoplastic cells with both glial and neuronal differentiation. The lack of specific biomarker panels has resulted in large inter-observer variability in their diagnosis