Case Presentation: USCAP 2016

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Case History

• 53 year-old female with a long-standing history of migraines with visual aura.
• MRI in 2009 revealed a non-enhancing abnormality in the right frontal lobe.
• The patient was apparently told at the time that no treatment was necessary.
• In 2014, developed vertigo and a second MRI revealed growth of the mass with new punctate regions of contrast enhancement.
• Received subtotal resection
Representative Imaging

FLAIR

T1 post contrast
1p FISH

Oligodendroglial

Astrocytic

Oncoscan MIP
Diagnosis

Composite oligodendroglioma and astrocytoma, with malignant transformation in astrocytic component
Case Discussion

• Gliomas have historically been classified based on morphological criteria into astrocytic, oligodendroglial, and mixed lineages

• Recent molecular profiling studies have called this scheme into question, particularly with regard to mixed lineage tumors (oligoastrocytomas)
Defined biomarker sets designate glioma subclasses that transcend histopathology

- IDH-wt tumors tend to behave like primary GBM, regardless of histopathology
- IDH-mutant tumors consist of those with 1p/19q codeletion and TERT mutation, and those with ATRX mutation and TP53 mutation
- While oligodendrogial and astrocytic features are enriched in these subclasses, respectively, there is significant morphological heterogeneity
- Oligoastrocytomas have no defining molecular features and tend to fall into either one of the IDH-mutant subclasses
Molecular subclasses outperform histopathological designations prognostically

Wiestler, B. et. al., Acta Neuropath, 2013
Glioma subclasses are easily designated in the clinical environment

ATRX and IDH1-R132H immunohistochemistry with subsequent copy number analysis and IDH sequencing as a basis for an “integrated” diagnostic approach for adult astrocytoma, oligodendroglioma and glioblastoma  Acta Neuropath, 2015

David E. Reuss · Felix Sahm · Daniel Schrimpf · Benedikt Wiestler · David Capper · Christian Koelsche · Leonille Schweizer · Andrey Korshunov · David T. W. Jones · Volker Hovestadt · Michel Mittelbronn · Jens Schittenhelm · Christel Herold-Mende · Andreas Unterberg · Michael Platten · Michael Weller · Wolfgang Wick · Stefan M. Plister · Andreas von Deimling

IDH1 R132H  ATRX  1p FISH
Profiling reveals “true” oligoastrocytomas with molecularly and histopathologically distinct components

Mixed glioma with molecular features of composite oligodendroglioma and astrocytoma: a true “oligoastrocytoma”?

Jason T. Huse · Eli L. Diamond · Lu Wang · Marc K. Rosenblum

Acta Neuropath, 2015

--1 case (shown today)

Oligoastrocytomas: throwing the baby out with the bathwater?

Paul Wilcox · Cheryl C. Y. Li · Maggie Lee · Brindha Shivalingam · Jeffrey Brennan · Catherine M. Suter · Kimberley Kaufman · Trina Lum · Michael E. Buckland

Acta Neuropath, 2015

--3 cases
Pathogenesis of composite gliomas

- Oligodendroglial and astrocytic components arise sequentially from the same foundational IDH-mutant clone
- Staged evolutionary process permitted by the indolence of the neoplasm(s)
Additional questions

• Incidence?
  - Likely more common than is currently appreciated. Larger resections and more detailed profiling may reveal higher rates moving forward.

• Behavior?
  - The astrocytic portion will likely behave more aggressively in most cases.

• Treatment?
References


