

Introduction to seizure semiology: Localization related epilepsy

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ILAE Classification of Seizures 2005-2009

Generalized seizures

- Tonic-clonic (in any combination)
- Absence
 - Typical
 - Atypical
 - Absence with special features
 - Myoclonic absence
 - Eyelid myoclonia
- Myoclonic
 - Myoclonic
 - Myoclonic atonic
 - Myoclonic tonic

ILAE Classification of Seizures 2005-2009

Generalized seizures (cont.)

- Clonic
- Tonic
- Atonic

Focal seizures

- Unknown
 - Epileptic spasms

Table 1. Comparison of major changes between the 1989 and 1981 Classification and Terminology and the newly proposed Terminology and Concepts (Commission 1981, 1989; Berg et al., 2010)

Old terminology and concepts

Recommended new terminology and concepts

Focal and generalized

For seizures

Focal (previously "partial"): the first clinical and electroencephalographic changes indicate initial activation of a system of neurons limited to a part of one cerebral hemisphere

Generalized: the first clinical changes indicate initial involvement of both hemispheres

For epilepsies

Localization-related (focal, partial): epilepsies with focal seizures Generalized: epilepsies with generalized seizures Focal seizures are conceptualized as originating at some point within networks limited to one hemisphere

Generalized seizures are conceptualized as originating at some point within and rapidly engaging bilaterally distributed networks

These terms were abandoned as overarching categories for classifying epilepsies per se, as many syndromes include both seizure types; they may still apply in some but not all instances

Berg AT, Scheffer IE. Epilepsia. 2011;52(6):1058-62

Focal seizure types

Complex partial: with impairment of consciousness Simple partial: consciousness not impaired secondarily generalized (note: this was not the terminology used in the 1981 document but has come into common use) No specific classification is recommended. Seizures should be described accurately according to their semiologic features without trying to fit them into artificial categories

Berg AT, Scheffer IE. Epilepsia. 2011;52(6):1058-62

 4. For focal seizures, the distinction between the different types (e.g., complex partial and simple partial) is eliminated. It is important, however, to recognize that impairment of consciousness/awareness or other dyscognitive features, localization, and progression of ictal events can be of primary importance in the evaluation of individual patients and for specific purposes (e.g., differential diagnosis of nonepileptic events from epileptic seizures, randomized trials, surgery). Nothing in this recommendation precludes describing focal seizures according to these or other features.

Descriptors of focal seizures

For pragmatic reasons and to facilitate continuity with the 1981 classification of seizures, descriptors of focal seizures may be used, individually or in combination with other features depending on the purpose. We have listed examples chosen to facilitate continuity with the 1981 seizure document and which have been drawn from the glossary of ictal semiology (Blume et al., 2001)

Table 2. Descriptors of focal seizures according to degree of impairment during seizure^a



Without impairment of consciousness or awareness

- With observable motor or autonomic components. This roughly corresponds to the concept of "simple partial seizure."Focal motor" and "autonomic" are terms that may adequately convey this concept depending on the seizure manifestations).

- Involving subjective sensory or psychic phenomena only. This corresponds to the concept of an aura, a term endorsed in the 2001 Glossary.

- With impairment of consciousness or awareness. This roughly corresponds to the concept of complex partial seizure."Dyscognitive" is a term that has been proposed for this concept (Blume et al., 2001).

- Evolving to a bilateral, convulsiveb seizure (involving tonic, clonic, or tonic and clonic components). This expression replaces the term "secondarily generalized seizure."

Semiologic Classification of Seizures

1. Auras

Somatosensory auras Auditory aura Olfactory auras Abdominal auras 2. Autonomic seizures

3. Dialeptic seizures

Typical dialeptic seizures

Visual auras Gustatory auras Autonomic auras Psychic auras

Semiologic Classification of Seizures

4. Motor seizures

Simple motor seizures Myoclonic seizures **Epileptic spasms** Tonic-clonic seizure Complex motor seizures Hypermotor seizures Automotor seizures 5. Special seizures Atonic seizures Hypomotor seizures

Tonic seizures Clonic seizures Versive seizures

Gelastic seizures

Atonic seizuresAstatic seizuresHypomotor seizuresAkinetic seizuresNegative myoclonic seizuresAphasic seizures

Han O Luders, Epileptic seizures: Pathophysiology and Clinical Semiology. 2000

Abdominal Aura



- Indescribable sensation in the abdominal area
- "Rising" to chest or throat
- Infrequently described as nausea
- Seen in patients with mesial temporal lobe epilepsy
- Symptomatogenic zone: insula or upper bank of sylvian fissure

Autonomic Seizure



- Activation of autonomic system
- Palpitation(tachycardia), sweating
- Objectively documented autonomic changes
- Symptomatogenic zone: basal frontal, anterior cingulate gyrus, or insula

Autonomic Seizure



F7-T3 T3, T5 T5-01 Fp1-F3 F3-03 C3-P3 P3-01 Fz-Dz Cz-Pz P4-02 01-02 A1-A2 X3-X4 EKG

HR=90/min



Simple Motor Seizures

Tonic: sustained increase in muscle contraction lasting a few seconds to minutes Clonic: myoclonus that is regular repetitive, involves the same muscle groups, at the frequency of 2-3 c/sec, and is prolonged





Bloome WT, Epilepsia, 42(9):1212-18, 2001

Right hand clonic seizure

Multifocal clonic seizure

Versive Seizures

Sustained, forced conjugate ocular, cephalic, and/or truncal rotation or lateral deviation from the midline

Complex Motor Seizures; Hypermotor Seizure



- Complex motor seizure affect primarily proximal body segments
- Large, rapid, violent movements
- Symptomatogenic zone: frontal or cingulate

Bilateral Asymmetric Tonic Seizures

- Asymmetric tonic posturing of limbs
- Occasional "Sign of 4"
- Contralateral to the extended arm
- Symptomatogenic zone: mesial frontal lobe(SMA)



Bilateral asymmetric tonic seizure

Automotor Seizures



- Hand or mouth "automatisms"
- Involve distal segments of body (fingers, hands, tongue, and lips)
- Often resembles a voluntary movement
- May consists of an inappropriate continuation of ongoing preictal motor activity
- Frequently associated with alteration of consciousness
- Seen in patients with TLE
- Symptomatogenic zone: possibly anterior cingulate

Gelastic Seizures

- Outburst of laughing or giggling
- Inappropriate for situation and emotional tone
- Stereotyped
- Seen in patient with hypothalamic harmatoma
- In neocortical epilepsies: frontal, temporal lobe
- Dacrystic- outburst of crying





Thank You for Your Attention

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