

Complex Partial Seizures or Compulsive Behavior?

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Posted: Nov. 21, 2012, 6:00 pm. EST

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Complex partial seizures are well recognized in human medicine and, according to some authorities, are more prevalent than tonic-clonic seizures. However, these focal electrical events are not widely acknowledged in veterinary medicine.

It was a different story in the 1960s, when numerous automatonish behaviors were classified as partial seizures. A trip down memory lane to the Kirk's Current Veterinary Therapy of 1960 or so is all it takes to be reminded of this fact.

One of the reasons for the abandonment of the partial seizure diagnosis was the realization that many repetitive behaviors were not so much of seizure origin but actually were (obsessive) compulsive disorders—a completely different barrel of fish. But the realization that some behaviors could be compulsive doesn't necessarily mean that partial seizures never occur. Odds are they should.

Another reason for the unpopularity of diagnosing these conditions is that they often produce subtle—though frequently highly unusual—clinical signs.

Simple partial seizures in people, which often precede complex partial seizures, may involve only altered perception, such as déjà vu or jamais vu. Both are tough to detect in a dog! But complex partial seizures, once developed, produce obvious clinical signs.

The locus of the seizure focus determines precisely what emerges from a seeming Pandora's Box of anomalous behaviors. Many partial seizures (60 percent in people) originate in the temporal lobe of the brain, which houses the limbic system and oversees emotions, sensation and memory.

Seizures in this area may cause changes in affect as well as behavior. The hypothalamus, sometimes classified as a limbic structure, controls—among other things— affective defense response, predatory behavior and sexual behavior. Any of these functions can be disturbed by a seizure focus in this region.

A seizure focus in the medial hypothalamus should theoretically cause bizarre and excessive

aggression. Dr. Alexander De Lahunta described a “rage syndrome” as a result of limbic seizures in his textbook on veterinary neuroanatomy and clinical neurology anatomy.

I think he was right, though the term “rage” has fallen into disrepute because of over- and misdiagnosis.

Seizures in the lateral hypothalamus should, according to first principles, cause bizarre appetitive or consummatory behaviors. We described such anomalous presumed seizure-based behavior in a double case report involving the bizarre eating and swallowing behavior of two dogs in the Journal of the American Veterinary Medical Association.

A seizure focus in the amygdala should produce inexplicable and intense fear. I have seen such cases, one confirmed by EEG and responding positively to anticonvulsant therapy.

But just in case we get into over-diagnosis of behavioral seizures once more, let’s consider what might distinguish a partial seizure from other anomalous behavior, including stereotypies and [compulsive behaviors](#). Here are a few pointers that would indicate a seizure rather than a pure behavioral etiology:

- Tend to occur in seizure-prone breeds (e.g. beagle, Bernese mountain dog, etc.)
- Often develop around puberty (8-10 months old); usually before 2 years of age
- Discernible pre-ictal mood change (e.g. depressed, irritable or flat mood)
- Behavioral event is often sudden in onset and bout-like—though bouts may cluster into a lengthy sequence
- Behavior is often extreme, irrational, apparently unprovoked
- Behavioral event may be triggered by stress or an environmental event (noise, flashing light)
- May be associated with autonomic signs (salivation, urination, anal gland discharge)
- Post-ictal depression/unresponsive or even aggression

Below are a few of the possible manifestations of partial seizures described in more detail:

“Rage” (episodic dyscontrol)

- Best known in springer spaniels (“springer rage”). Also occurs in other breeds, such as cocker spaniels, bull terriers, retrievers
- Violent, uncontrolled aggression
- Owner senses pre-ictal mood change (knows something will happen)
- Trivial or no provocation
- Lasts longer than conflict aggression (minutes)
- May be days or weeks between events (unlike conflict aggression)

Diagnosis

Based on clinical signs and response to treatment. EEG serves to confirm the diagnosis but is not available in many centers.

Treatment

- Phenobarbital, levetiracetam, zonisamide or other anticonvulsant
- Correction of hypothyroidism, if present
- Advise owners about management (special attention to avoidance/safety)

Prognosis

The prognosis is fair for producing a reduction in the frequency of bouts. The problem is that even one attack per year may be too much for an owner to accept.

Fly Snapping

While the usual modern interpretation of fly snapping is that it is a canine compulsive disorder, there are a number of scientific papers that mention it in association with seizures. An epileptic focus in the lateral hypothalamus would cause untoward (misdirected or undirected) predatory behavior and this may be what is going on, at least in some cases.

Tail Chasing

A placebo-controlled study we conducted showed that seven of seven tail-chasing bull terriers had an unusual “epileptiform” EEG. Controls did not. Whether the abnormal EEG was the cause or effect of the problem is not clear.

Some tail-chasing German shepherds refractory to anti-obsessional medication respond positively to treatment with phenobarbital so we believe they also may have a seizure component underlying their tail-chasing behavior.

Abnormal Ingestive Behavior

The double case report I referred to above described an episodic form of ingestive behavior in two dogs that [ate inedible materials](#), including linoleum, clumps of hair and dirt.

In addition, the dogs stared vacuously between scavenging bouts, making swallowing/gulping motions. Some dogs with this disorder lick their lips and lick the floor. In one case, aggression, atypical for that dog, always occurred in the recovery phase following the ingestive bouts.

Paroxysmal Fear

We have seen a few cases of extreme and irrational fear in dogs that seem to be seizure-based as determined by the bout-like nature of the problem, EEG evidence in one case and positive response to anticonvulsant medication. It seems likely that the amygdala was the seizure locus in these cases.

In some cases we have suspected of having partial seizures, dogs have subsequently developed unilateral motor seizures (Jacksonian type) or even tonic-clonic seizures, seemingly corroborating the partial seizure diagnosis.

The point is that partial seizures most likely do occur and may even be reasonably common. Their diagnosis can be confusing, however, especially without access to an EEG for confirmation. Often the diagnosis must be based on rule out and clinical signs and confirmed (as best we can) by a positive response to anticonvulsants.

I hope this report will make clinicians more aware of the possible involvement of partial seizures in bizarre bout-like behaviors and steer them toward appropriate treatment.

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