

CMO: The Basics of a Painful Disease

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MacDuffie is a Scottie with CMO. His owner, New Yorker Maureen Drummond, is dealing with MacDuffie's pain. She called in May, searching for treatment ideas. She needed reassurance, too. Would MacDuffie always have pain? Would he die young?

CMO, officially craniomandibular osteopathy, is a painful, non-cancerous disease that involves excess bony growth in immature dogs. Other names are Lion Jaw, Scottie Jaw and Westie Jaw. It affects the mandibles (jaws), sometimes the temporomandibular joints, occasionally skull bones and more rarely long bones of the legs. First mention of the disease in veterinary literature was in 1958, in several Westies.

Since then, test breedings have proved CMO is inherited by autosomal recessive genes, at last in the three prime affected breeds, Scottish Terriers, West Highland White Terriers and Cairn Terriers. That means 25% of pups from carrier parents will have CMO, 50% will be carriers and 25% will be not-carriers.

Dr. George Padgett's book *Control of Canine Genetic Diseases* (1998) shows 31 breeds affected by CMO, far more than veterinary texts reflect. Eleven are terrier breeds: American Staffordshire, Border, Bull, Cairn, Dandie Dinmont, Kerry Blue, Scottie, Skye, Soft-Coated Wheaten, Staffordshire Bull and Westie. More recently a Smooth Fox Terrier has also been reported.

CMO is an unusual disease, and it is misunderstood. Breeders, owners and veterinarians need to recognize symptoms, know how to confirm diagnosis and treat CMO, and understand the usual course of CMO and its lack of impact on a dog's later life.

"It's a horrifying scream when you touch the jaw," describes Drummond of MacDuffie's pain. Her veterinarian diagnosed MacDuffie's CMO at 6 months old by x-rays, and the pup has since been treated with the corticosteroid prednisone and several analgesics, including Tylenol with codeine. MacDuffie's vet thinks his case is midlevel in severity.

MacDuffie had a particularly frightening even when he was 7 ½ months old. Drummond notices him drinking water very awkwardly. He was trying to sip through the side of his mouth. His jaw was not opening normally. With MacDuffie screaming in pain when Drummond touched his head, they headed for the emergency clinic. An injectable painkiller and increased prednisone ended the crisis.

The fraternity of those who have brought puppies through CMO is always ready to bolster the nerves of owners whose puppies are in pain with CMO. In Drummond's case, it was STCA member Carla LaCoe, Fort Worth, TX, who helped. In the early 1980s, LaCoe successfully treated several CMO-affected puppies.

"We were preparing ourselves for the idea of putting MacDuffie to sleep," said Drummond. "The vets mentioned that possibility. They said nobody really knows what to expect and that dogs are all different. Carla told us, 'Hang in there. You're almost there.' She was very helpful and positive and reinforced the idea that MacDuffie will get through this."

MacDuffie at nine months old already seems on the mend. "He's using his jaw more," updates Drummond. "MacDuffie is playing with balls, whereas before he'd only play with soft cuddly toys."

A Disease That Disappears

Many veterinarians have never treated a case of CMO. My own veterinarian in Temple, TX, Dr. Gary Gosney, has practiced for several decades, but has never seen a case. Thanks to Dr. Gosney for providing veterinary references for this article.

Those texts point to age at onset of four to 10 months. Four to seven months is most common. Strangely this is a disease that affects the young, then resolves itself. Experienced breeders and veterinarians can find CMO earlier than four months by recognizing subtle clinical signs and palpating the bony growths.

Symptoms of CMO are swollen jaws, drooling, a mouth that won't open, pain when the jaw is manipulated, intermittent fever and lethargy. An owner's first clue that something is wrong may be when the puppy shows discomfort when chewing. CMO is a cyclic disease, with episodes of bone resorption and proliferation. Symptoms run in 10 to 14 day pain/fever cycles.

Diagnosis is confirmed by radiographs which can be evaluated by any board certified veterinary radiologist. Saunders Manual Of Small Animal Practice by Birchard and Sherding recommends survey radiographs of the skull and mandible including oblique, dorsoventral and lateral views.

I was disappointed that veterinary texts make CMO seem so grim, and don't emphasize that it is basically a short-term problem for owners and puppies to "get through." CMO is grim when the puppy is having pain, but talk with Westie, Cairn and Scottie breeders who have dealt with multiple CMO-affected dogs themselves and counseled many other owners and one gets a more balanced, hopeful outlook. It is an extremely rare CMO dog that should be put down. Sadly, some are euthanized needlessly.

Westie breeder Anne Sanders, Stanwood, WA, developed and maintained WatchH, the first CMO registry, as a service to Westie breeders, helped found the Westie Foundation, and has worked with CMO DNA research since its beginning. She knows CMO! And she has advised owners of many breeds. "Most people are so relieved when they find out their puppies will recover and live a normal lifespan," recounts Sanders.

Prednisone Treatment Protocol

The Westie club's Internet site (www.westieclubamerica.com) carries Sanders' article "Cranio-mandibular Osteopathy" with its helpful protocol for administration of prednisone, including a sample treatment schedule. Anyone dealing with a CMO-affected puppy should read this article, and show it to the dog's veterinarian.

"I have personally treated half a dozen Westies," states Sanders in the article. "They have recovered and lived full and healthy lives. I know people are scared of giving cortisone, but I successfully treated one dog until he was 14 months, and he is now 11 years old and doing fine."

Sanders will discuss CMO, its diagnosis and treatment with owners or their veterinarians by e-mail at Asanders@Starband.net, or ph. 360/629-6434 (PST). Those without Internet access may request the article from Anne Sanders, 33101 44th Ave. NW, Stanwood, WA 98292-7106.

Another person who emphasizes that CMO is a short-term problem is Clare Redditt, Ovid, NY, chairman of the Cairn Terrier Club of America Health Committee. She is the mother of CMO DNA research. Redditt interested a researcher in finding the CMO gene and developing a test for it, then congealed a joint venture club partnership. Redditt's work enabled the Cairn, Westie and Scottie health foundations to deliver the CMO project to the American Kennel Club's Canine Health Foundation (AKC CHT) on a silver platter. Thanks to Redditt, there was a researcher ready to work, the commitment of the three terrier clubs to match ACK CHF with half the grant monies, and the remarkable accomplishment of having collected the basic DNA required before the research proposal was submitted to AKC CHF.

"My Fraiser (who had this awful case) lived to be 13 and had a wonderful life in a pet home," remembers Redditt. Fraiser lived with geneticist Dr. George Padgett during the test breeding which confirmed CMO is carried by a recessive gene. Redditt's husband Bud "used to look at Fraiser's eyes every morning, and he could tell when an attack was coming on. It is important to get the prednisone into the dogs as soon as possible, while you can still touch their mouths. We contended with it for 13 months with Fraiser. Very seldom does it last this long.

Severity of symptoms varies widely. "It can be there without any clinical signs," warns Redditt. "Just because breeders never saw it doesn't mean it wasn't there. In our CMO litter, there was Fraiser with this awful, awful case; Feffie, the girl that had one attack and was treated only once with prednisone; and Ferguson, who showed CMO by x-ray, but never had any clinical signs.

The interesting thing about CMO is that not only does pain disappear with adulthood, (usually by 10 to 12 months), but the bony abnormalities actually regress. Not always completely, but x-rays taken several years after clinical signs may not even show CMO's previous molding of bone. Because of that fact, Redditt says that GDC (Institute for Genetic Disease Control, the organization that has maintained the Cairn Terrier CMO registry) requires that pups be x-rayed before six month of age to qualify for documentation as unaffected. A light case might not show on radiographs at a later age.

Treatments mentioned in vet texts include analgesics and anti-inflammatory drugs including corticosteroids. Suggested NSAIDs (non-steroidal anti-inflammatory drugs) are buffered or enterically coated aspirin, caraprofen, etodolac, phenylbutazone, meclufenamic acid, and piroxicam. Some cases are so mild that treatment with baby aspirin or only one injection of cortisone is enough.

Catching the pain cycles early, so medications can be administered while a puppy will allow its mouth opened is important. Carla LaCoe's daughter discovered that her Norwich Terrier could predict the family Scottie's CMO attacks.) Teddy would start licking Shafer's head 24 to 36 hours before the pain would start, perhaps sensing that Shafer's head felt hot. Owners of CMO puppies need to learn to "read" their pups like this Norwich could, and like Redditt's husband Bud could.

A high calorie, protein rich gruel or soft diet is important so pups that have trouble chewing get sufficient food. It's wise to limit access to chew toys and to make tug-of-war games and roughhousing off limits.

In order to reduce the incidence of CMO, breeders, especially Westie and Cairn breeders, have used CMO registries, pedigree analyses, test breedings, and diagnostic x-rays to prove breeding stock is not subclinically affected. The coming CMO DNA test will make it easier to avoid CMO.

Joint Terrier CMO Research

Scottish Terrier Health Trust Fund (STCA HTF) along with the Westie and Cairn health foundations and AKC CHF tackled CMO in 1998 by funding a \$90,000 research project to develop a linkage-based DNA test. The grant is titled "Development of a DNA-Based Diagnostic Test for Craniomandibular Osteopathy in the Cairn Terrier, West Highland White Terrier and Scottish Terrier Breeds." Ultimate goal is a direct gene test like Scotties have for vonWillebrand's disease. Such a test will empower breeders to guarantee that no puppies will suffer the pain of CMO. Health club surveys show "guesstimates" of CMO carrier incidence at Scotties, 4.7% (1995), Westies, 22.1 % (1999), and Cairns, 13.59% (1999).

Dr. Patrick Venta, Michigan State University, is researcher for our CMO project. Work is slow because Dr. Venta is making new markers that will let him compare the dog genome map to the human map and use similarities to help shortcut future research. Remember the years it took to find the vWD gene!

Though he has sufficient DNA to find the CMO linkage, additional samples will give Dr. Venta more statistical power. By early July, 2002, Dr. Venta had DNA from 50 affected dogs and 251 unaffected relatives. Seventeen of the affected dogs are Scotties, 23 Westies, and 10 Cairns.