



Occipitoatlantoaxial Malformation (OAAM):

Occipitoatlantoaxial Malformation (OAAM) is a neurologic disorder caused by a malformation of the occipital bone of the skull and the first two cervical vertebrae (the atlas and axis), with fusion of the atlas to the base of the skull. An unusual variation of this malformation can be the presence of an additional atlas. This abnormal structure causes a compression of the upper portion of the cervical spinal cord, resulting in damage.



Figure 1: Dorsal view of disarticulated skull, atlas, and axis of a normal foal.



Figure 2: Dorsal view of the skull of an Arabian foal with OAAM with the small atlas fused to the occipital bone and the disarticulated axis with broad transverse.

(images used with permission of Dr. Alexander de Lahunta, Veterinary Neuroanatomy and Clinical Neurology [3rd Edition])

Clinical signs range from mild progressive incoordination and weakness of the limbs which can progress to the inability to stand. Age of onset of clinical signs can also vary; affected foals may be stillborn, shows signs at birth or, in some cases, not show signs until a few weeks after birth. Affected foals are generally euthanized. Rarely some mild cases may not show signs of being affected until the horse is several years old; in these cases even if the horse is not euthanized, it should not be bred. Some additional clinical indications may include a clicking sound when the horse moves its head and neck, an abnormal head and neck carriage with neck extended, a reluctance to move the neck, or signs of neck twisting. The malformed atlas and axis can often be palpated, with diagnosis being confirmed with radiographs.

Video clip: <http://www.neurovideos.vet.cornell.edu/Video.aspx?vid=11-02#>

Although the mode of inheritance for OAAM has not been determined, and to date no breeding trials have been reported; limited research strongly suggests OAAM is an autosomal recessive trait. “Autosomal” means that there is no sex linkage, so both males and females can be equally affected. “Recessive” means that in order for a foal to be affected, it must have received two copies of the mutated gene, inheriting one copy from each parent. Horses that have one copy of the mutated gene, in

ARABIAN HORSE ASSOCIATIONSM

10805 East Bethany Drive | Phone 303-696-4500
Aurora, Colorado 80014 | Fax 303-696-4599
www.ArabianHorses.org | info@ArabianHorses.org



combination with one copy of the normal gene, are physically normal but are considered carriers and have a 50% probability, each time they are bred, of passing the mutation along to their offspring.

Current research on OAAM is very limited. To assist with gathering information, owners are encouraged to report affected foals to FOAL.org.

Reference Materials

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- 6) Mayhew IG, et al. Congenital occipitoatlantoaxial malformations in the horse. Eq Vet J 1978;10(2):103-13. <http://www.ncbi.nlm.nih.gov/pubmed/565704>

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