RECOGNIZING ANIMALS WITH BRACHYGNATHIA SUPERIOR (UNDERBITE) AND MANDIBULAR BRACHYGNATHIA (OVERBITE).

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This document is to help interested persons be able to more easily recognize brachygnatia superior (underbite) because of underdeveloped upper jaw and facial bones on mammals and birds. Mandibular brachygnathia (overbite) because of an underdeveloped lower jaw on mammals is also addressed.

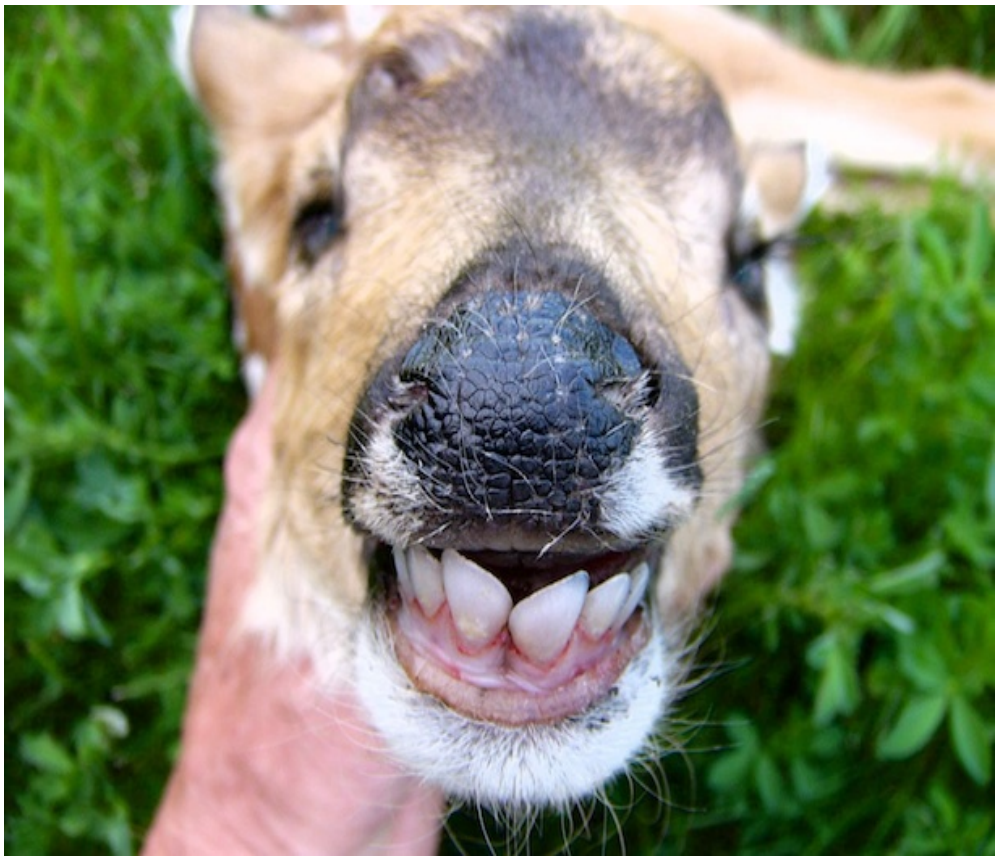
A newborn white-tailed deer fawn with severe brachygnathia superior/underbite and odd shaped lower incisors, which are much wider than the dental pad. This fawn died immediately after being born, so has dried afterbirth on its face.

BRACHYGNATHIA SUPERIOR (UNDERBITE) ON UNGULATES AND CARNIVORES.

The cleaned skull of a newborn white-tailed deer fawn showing the narrow premaxillary bone and very wide odd shaped lower incisors. This is typical of the tooth and bone development on most individuals of all ruminant species examined that had brachygnathia superior.

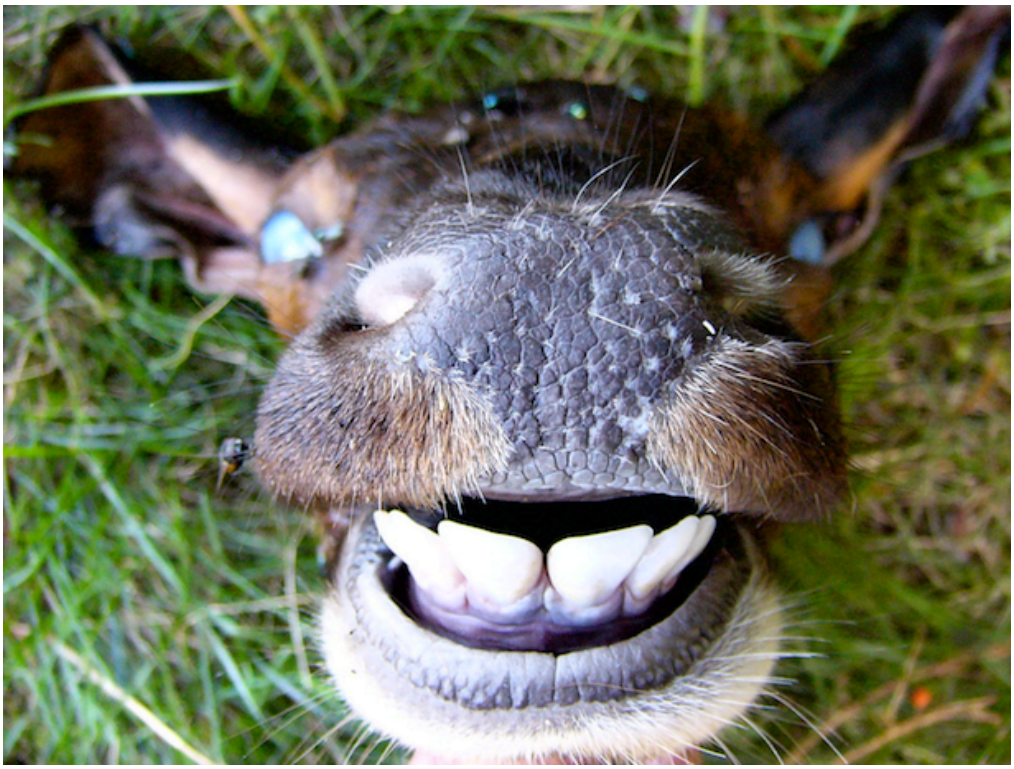
A side view of a different white-tailed deer fawn showing short, narrow underdeveloped premaxillary bone and splayed lower incisors.

Another newborn white-tailed deer fawn, which died soon after being born, because it did not get any milk. This fawn had underdeveloped skull bones as well as underdeveloped premaxillary bone, leaving a hole in the skull bones. Also, note how much wider the lower incisors are compared with the width of the premaxillary bone.



Mule deer fawn with similar developmental malformations to the white-tailed deer fawn on **page 1.** It has a narrow skull and small eyes in addition to the underbite.

A close-up of the lower incisors and dental pad of a live mule deer fawn that was born with a severe underbite. Note how much wider the incisors are than the dental pad.



An elk calf with fairly severe brachygnathia superior/underbite and lower incisors wider than the dental pad. This calf died of a ruptured blood vessel in the lungs.

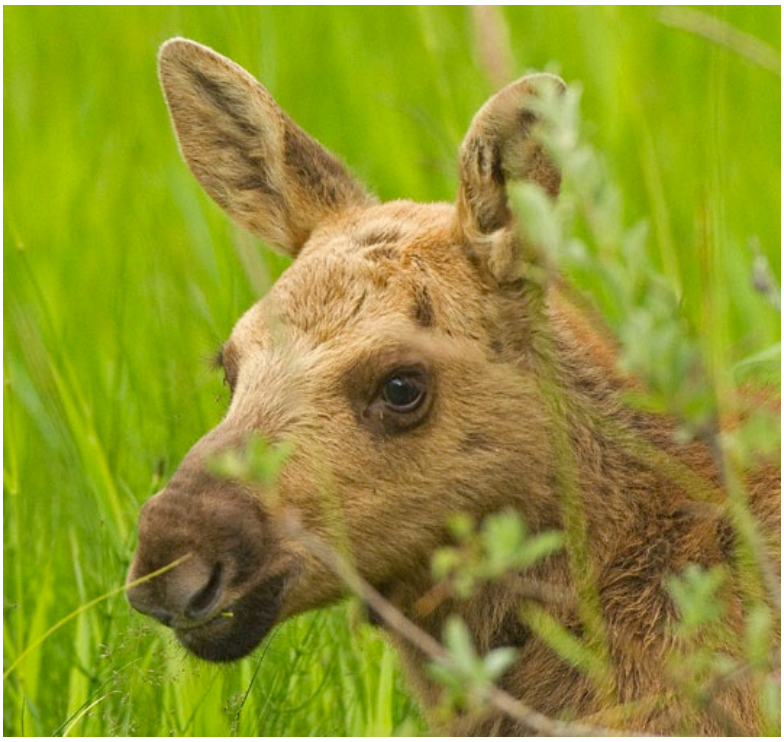
This is a cleaned skull of a 3 week-old elk calf that died of a herniated umbilicus. Herniated umbilicus is a birth defect reported to be caused by Congenital Fetal Hypothyroidism (CFH), as is brachygnathia superior. In this view of the jaw bones, the underdeveloped premaxillary bone is evident, as is the underbite and wide incisors.

These are cleaned skulls of hunter-killed female elk from the 2013 Montana hunting season. The lower incisors are far forward of and wider than the anterior of the premaxillary bone where the dental pad is located. In some cases, the incisors are much wider than the premaxillary bone and obviously splayed.

Many photos people post of elk on the Internet show elk calves with fairly severe underbite. These calves couldn't completely close their mouth over the protruding lower incisors. These photos were taken in states other than Montana.

This is a bighorn sheep lamb born on the National Bison Range north of Missoula, MT in 2013. The severe underbite with protruding lower incisors is evident.

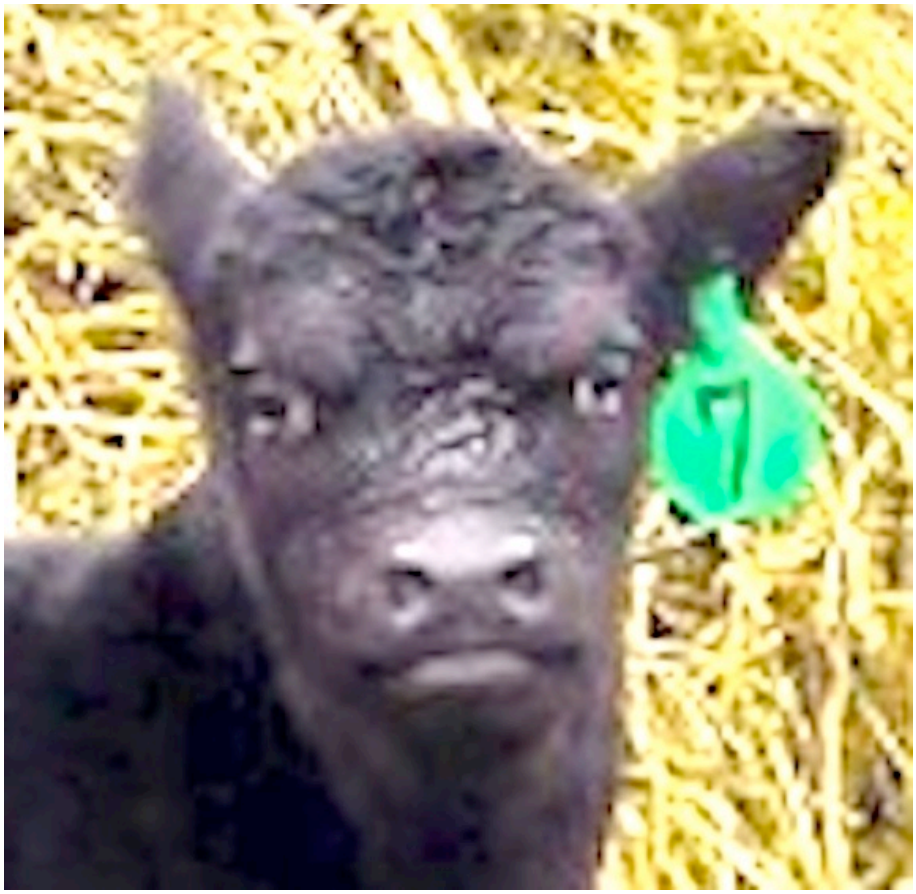
This photo of an adult mountain goat with a severe underbite was taken by a tourist in Glacier National Park, MT.



Photos of moose calves with brachygnathia superior are often posted on the Internet. On a moose calf with a normal bite the lower lip should tuck in behind the upper lip. The persons posting photos of moose with underbite likely don't recognize that the calves have a birth defect. It not likely a coincidence as more moose calves began being born with underbite, the moose populations began "mysteriously" crashing.

This bison calf has obvious brachygnathia superior/underbite, causing the lower incisors to be visible. In addition, the muzzle has the characteristic rounded appearance that occurs on bison and bovines because of the short, underdeveloped premaxillary bone.

This domestic beef calf had severe brachygnathia superior/underbite, with a rounded upturned muzzle. This calf was diagnosed by a veterinarian to have what is termed Weak Calf Syndrome, of which the calf died. Multiple developmental malformations which occur with Weak Calf Syndrome (WCS) are identical to birth defects caused by Congenital Fetal Hypothyroidism (CFH).



A side view and a front view of two different beef calves photographed by Tom Bauer on a ranch in Ronan, MT. Note on both, the lower lip is forward of the upper lip, the face is severely dished, the muzzle is rounded and points upward and the eyes face forward, rather than being on side of the head; not good conformation on beef calves.

This is an adult male hunter-killed antelope with severe underbite. When a grazing animal has an underbite, the foliage slips out from between the front of the dental pad and the top of the lower incisors, resulting in a characteristic wearing on the tops of the incisors, particularly the two middle incisors. Hunter-killed pronghorn antelope have the highest prevalence (over 70%) of underbite of any Montana wild ruminant we have examined. Antelope also have one of the highest prevalences of overbite.

This cleaned skull of a domestic cat illustrates brachygnathia superior on a feline.

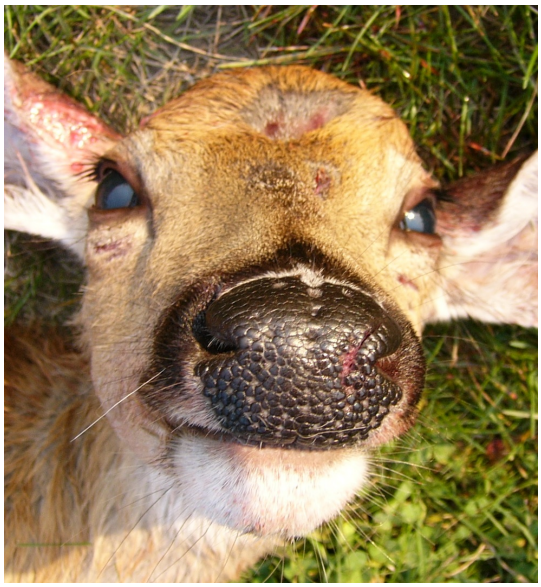
This newborn domestic goat kid has severe brachygnathia superior, with very large incisors covered with soft skin tissue, indicating a premature birth. The lower incisors are almost twice as wide as the dental pad. This goat had goiters and died after birth.

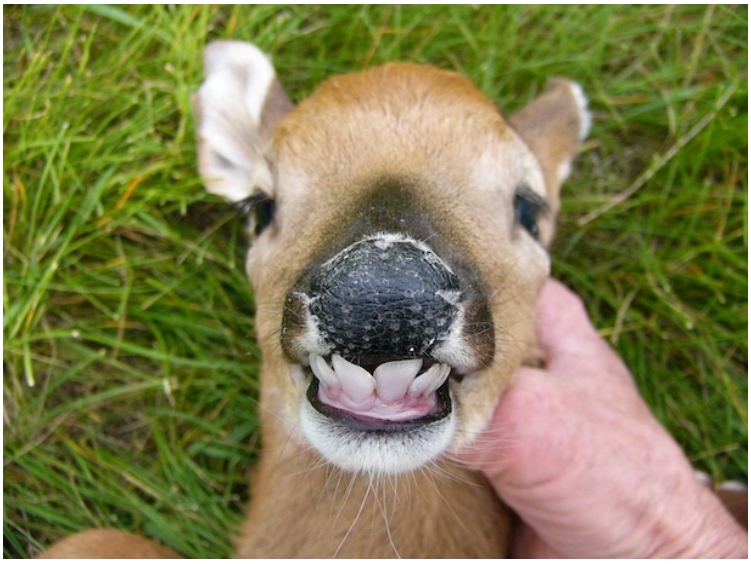
This adult male dog has a severe underbite and crooked lower incisors, showing that canines are also born with brachygnathia superior. Wolves and wolf pups have been observed with underbite.

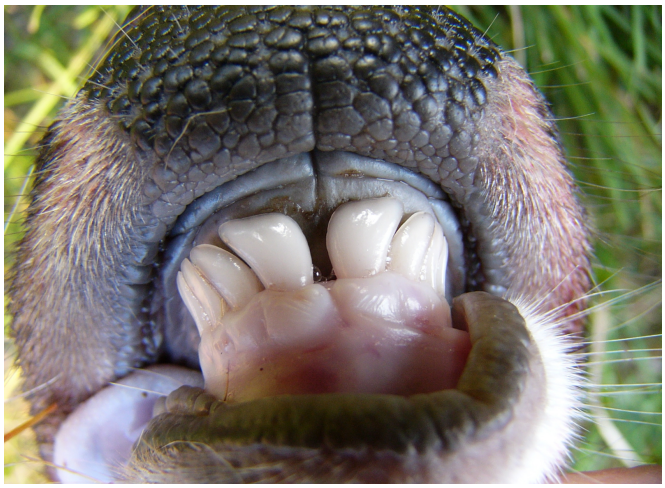
Some newborn animals have severe underdevelopment of the upper facial bones and soft tissue, similar to the human child on **page 25**. This filly foal, born in 2001 had to be euthanized because of the facial malformations. She could not suckle and had no eyes formed in her eye sockets. Other than the severe facial malformations, this newborn appeared to be healthy.

This live filly foal, born in Michigan in 2012, had very severe brachygnathia superior.

NORMAL VS. BRACHYGNATHIA SUPERIOR AND NARROW PREMAXILLARY PAD.







All views of the normal bite is same fawn.

The top two of underbite are same fawn, bottom shows a different fawn.

On this hunter-killed 3 1/2 year-old white-tailed deer with a normal bite, all incisors are contacting the normal sized premaxillary pad as was typical for all observed ruminants prior to 1995. The difference between this deer's bite and the bite of a deer or other ruminant with brachygnathia superior is easily observed.

This is the side view of the same deer shown in the photo above, with all incisors contacting the premaxillary pad and the middle incisors contacting the pad approximately 2 millimeters behind the extreme anterior of the pad.

This photo shows how we measure the mouth from the anterior of the dental pad to the top edge of the lower incisors to get the measurement of an underbite on a deer, antelope or other ruminant. Obviously the actual underbite is somewhat more, since the top of the lower incisors with a normal bite contact at from 1 to 2 millimeters behind the anterior of the pad, as on the normal deer on **page 16**.

All ruminant species from Montana that my colleagues and I examined in 2013 have a high prevalence of brachygnathia superior/underbite, ranging from 35% to 75%. Any malformation with a prevalence of over 5% is supposed to raise a red flag according to text books. The prevalence of underbite on ruminant species in Montana passed 5% in 1997 and has increased significantly since. For example, I examined 18 deer fawns born in 2013. Of the 15 WTD fawns, only 3 (20%) had a normal bite. All 3 mule deer had a severe underbite, thus of 18 deer fawns, 15 or 83% had an underbite.

BRACHYGNATHIA SUPERIOR WITH SHORT UPPER BILL ON BIRD SPECIES.


Underdeveloped upper face and upper bill on Northern Flicker and Nighthawk.


Brachynathya superior on House Finch and Tree Swallow fledglings. The swallow also has disrupted keritin development on the lower bill.


Brachygnathia superior on adult California Quail bottom quail. Top quail normal. On left is an Anna's Hummingbird with short upper bill.

Brachygnathia superior on an adult Golden Eagle. The upper bill was so short that in order to close its mouth the bird forced the tip of the upper bill completely through the lower bill, causing severe damage to the lower bill and mouth.

MANDIBULAR BRACHYGNATHIA (OVERBITE) ON MAMMALS.

This photo of the facial bones of an adult male mule deer shows the lower jaw is short and underdeveloped in the area forward of the premolars. This deer was killed in a fight with another mule deer during the breeding season in 2010. Note the upper and lower molars are in normal position and mesh normally. The premaxillary bone is normal in length on this deer. The anterior of the lower jaw between the premolars and the incisors is underdeveloped quite severely, resulting in an overbite, similar to the live white-tailed deer at the top of **page 21**.

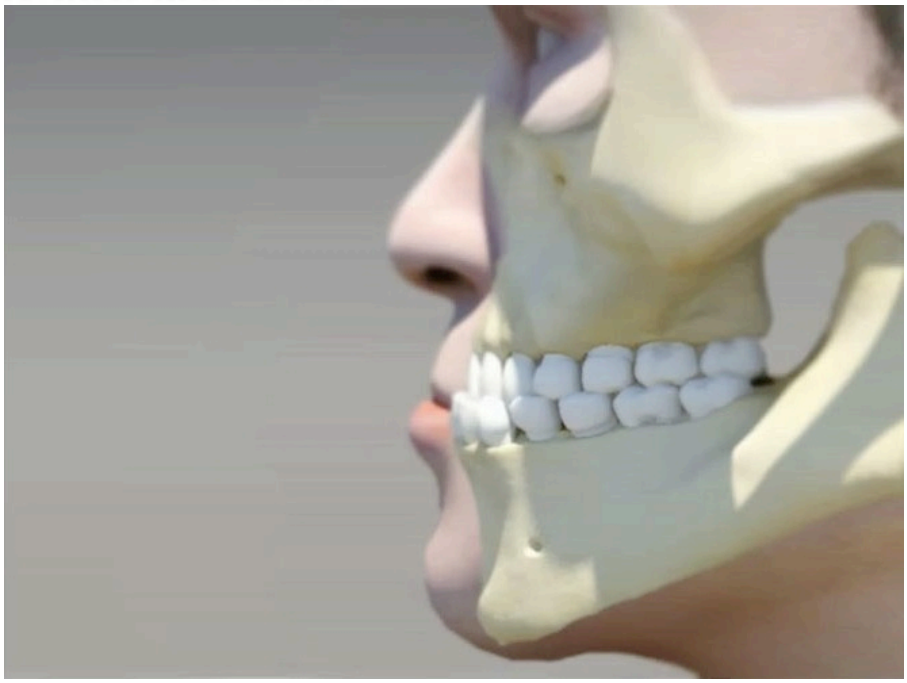
Overbite is more common on pronghorn antelope from Eastern Montana at 17%, than on other hunter-killed ruminants we examined. Montana hunter-killed mule deer and white-tailed deer have an overbite prevalence of approximately 8%. Underbite is much more common than overbite on all ruminant species we examined for our 2011 study (J.A. Hoy, G.T. Haas, R.D. Hoy & P. Hallock, *Observations of brachygnathia superior in wild ruminants in Western Montana, USA.* Wildlife Biology in Practice, 2011 December 7(2): doi:10.2461/wbp.2011.7.13) free on Google.

A male white-tailed deer with mandibular brachygnathia or short lower jaw. It also has skin tumors on its face and body. This deer was photographed near Hamilton, Montana in 2009. The extremely short lower jaw is easily observed on this live animal.

This is a Nevada vehicle-killed male pronghorn antelope with an extremely short lower jaw/overbite. This was the only antelope we found to examine in Nevada.

This elk calf in a photo from the Internet has an obvious overbite/short lower jaw.

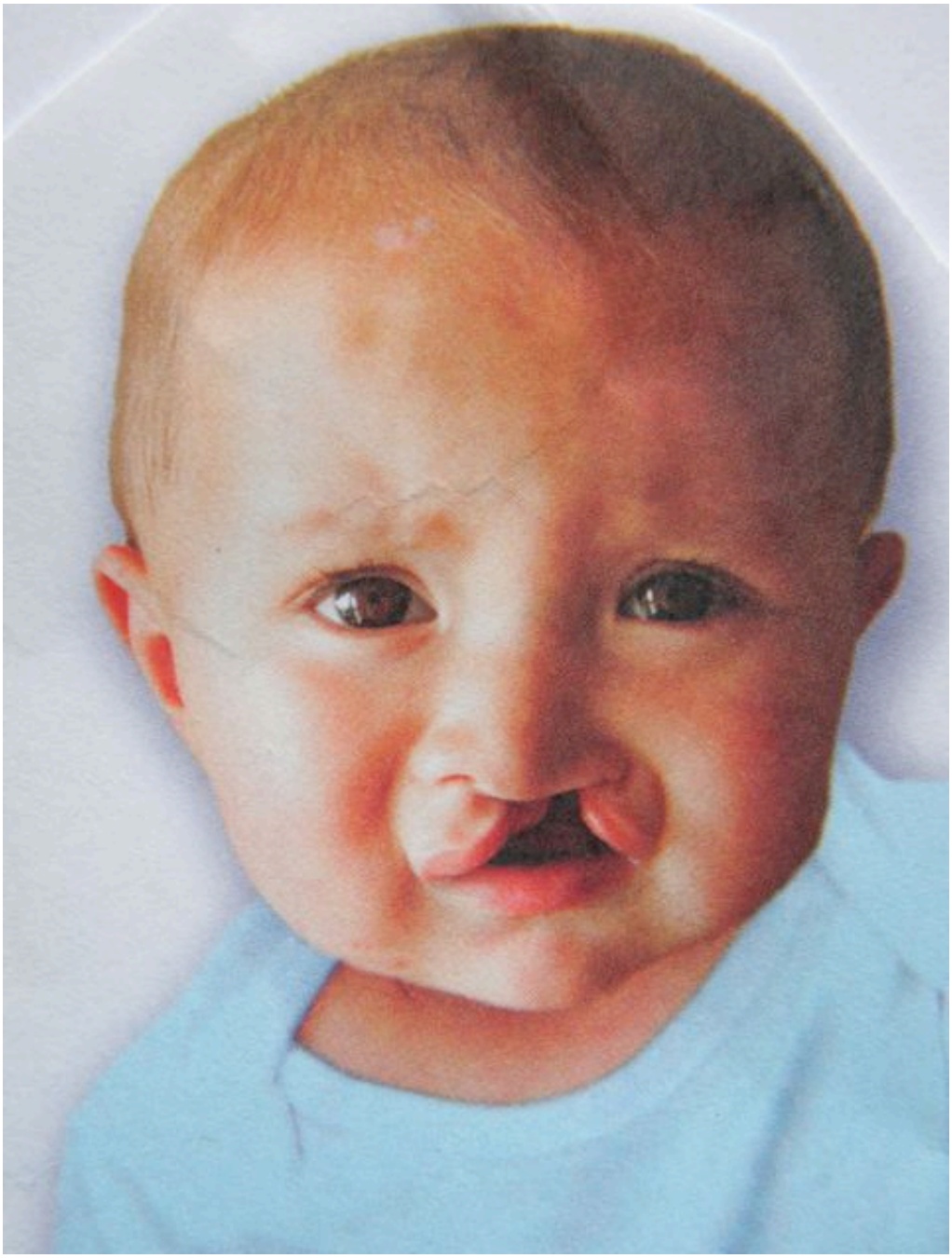
SIMILAR FACIAL MALFORMATIONS ON CHILDREN



Brachygnathia superior/underbite on a child appears very similar to an underbite on other mammals. The upper facial bones and upper jaw have disrupted growth during fetal development, a definitive symptom of CFH on other vertebrate species. As on other mammals, the lower lip is usually significantly forward of the upper lip.

Although a child can eat with an underbite or an overbite, these birth defects have a serious effect on a child's appearance and thus can have deliterious affects for the life of the affected newborn.

With overbite on a child, the lower jaw bone, including the chin is underdeveloped. I asked a dentist who specialized in children's dentistry in Missoula, MT about underbite and overbite on the children he sees. He stated that in recent years he has seen a significant increase in overbite on his patients.



Prevalence of underbite, overbite and cleft palate have been quite high in human newborns since 1995. These malformations on human newborns are similar and comparable to underbite, overbite and cleft palate on other mammal young. On birds these defects often manifest on hatchlings as short upper bill and occasionally, as holes in the upper bills. These malformations are definitive symptoms of disruption of the thyroid hormones during development in the womb or egg. Authorities need to quickly find what is causing so many young vertebrate animals to have symptoms of Congenital Fetal Hypothyroidism. The use of the endocrine disrupting environmental toxins responsible must be immediately curtailed for the sake of future generations.