

Bot Flies Cuterebriasis

compiled from information found at:
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Cuterebriasis is a condition in which the larvae of the *Cuterebra* fly develop under the skin.

What is the life cycle of *Cuterebra*?

Cuterebra is a large, bee-like fly that lays its eggs on soil, stones or plants, often near the entrance to dens, or close to burrows. As an animal brushes against the stones or plants, the eggs stick to the animal's fur. The eggs hatch, and the larvae either penetrate the skin, are ingested when the animal grooms, or they enter the animal's body through a natural opening, such as the nose.

In most cases, the larvae migrate to areas just under the skin on the head, neck, or trunk of the animal. In dogs, cats, and ferrets, who are not the usual hosts of this parasite, the larvae may also migrate to the brain, eye, eyelids, or throat.

As a larva matures under the skin, it becomes very large (up to ½ inch in length) and produces a nodule or swelling. A small opening develops in the skin, through which it breathes. A small amount of drainage may occur around this breathing hole.

How is cuterebriasis diagnosed and treated?

The swelling is commonly observed by the owner, who may think it is a small tumor. These swellings usually appear in the late summer and fall. When the animal is examined by a veterinarian, the area over the swelling is clipped, and the telltale opening will be seen. In some cases, the larva can be seen through the hole. Younger larvae are gray in color and have short rows of spines. Mature larvae are dark in color, and covered with spines.

Cuterebra larvae



Extreme care is used to remove the larvae. An incision is made through the skin, and the larva is carefully removed. If the larva is cut or crushed, the animal may develop an anaphylactic reaction or severe skin irritation at the site. The "pocket" that was formed around the larva is cleaned and flushed, and a topical antibiotic ointment may be prescribed. The thickening of the skin takes considerable time to resolve.

If the larva is not surgically removed, it will continue to enlarge and ultimately break through the skin and fall to the ground where it continues its life cycle by developing into a pupa, and then an adult.

Larvae (also called 'bots') of cuterebrid bot flies, including the tree squirrel bot fly (*Cuterebra emasculator* Fitch, Diptera: Cuterebridae), spend several days within the body of their rodent (chipmunks, mice, rats, tree squirrels, voles, pocket gophers, etc.) or lagomorph (rabbits and hares) host before choosing a site under the animal's hide where they settle down to feed and complete their development. Here they make a hole in the host's skin, through which they breathe and excrete. The lump in the animal's skin caused by the growing bot is called a 'warble' and the opening in the animal's hide is referred to as the 'warble pore'. We denote the 'age' of a warble (e.g., 1-week-old) as the time since initial formation of the warble pore.

After a larva has chosen a subcutaneous site, it begins to cut through the animal's skin with its two pointed mouth hooks. This image shows blood on a gray squirrel's hide as the bot creates the warble pore. Note that some of the animal's fur is missing, due to scratching of the area by the squirrel.



The warble, one week after the larva has cut the warble pore, forms a moderately sized lump in the squirrel's skin, as shown in this image. Excrement from the larva, whose pale white posterior end is protruding naturally from the warble pore, and possibly host body fluid, mats the squirrel's fur.



During the second week, the warble expands considerably, tightly stretching the squirrel's skin. This 2-week-old warble protrudes prominently from the body of the squirrel.



During the third week of development, the warble continues to stretch the animal's skin as the larva within approaches its maximum size. In the lower portion of this image, the darkened posterior end of the nearly mature larva can be seen filling the pore of the 3-week-old warble. Two days after this photo was taken, the larva backed out of the warble and dropped to the ground, where it burrowed into the soil to pupate.



After a larva has exited its warble, the squirrel is left with a gaping warble pore, as seen in this image. However, healing generally occurs relatively rapidly; within about a week the size of the warble has decreased considerably and the warble pore has healed shut. Eventually, the swelling subsides and the animal's fur grows back, leaving little or no sign of the previous infestation.