THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
Popular Article
December, 2025 Vol.5(12), 11216-11221

Comprehensive Overview of Canine Aural Haematoma: Etiology, Diagnosis and Surgical Management

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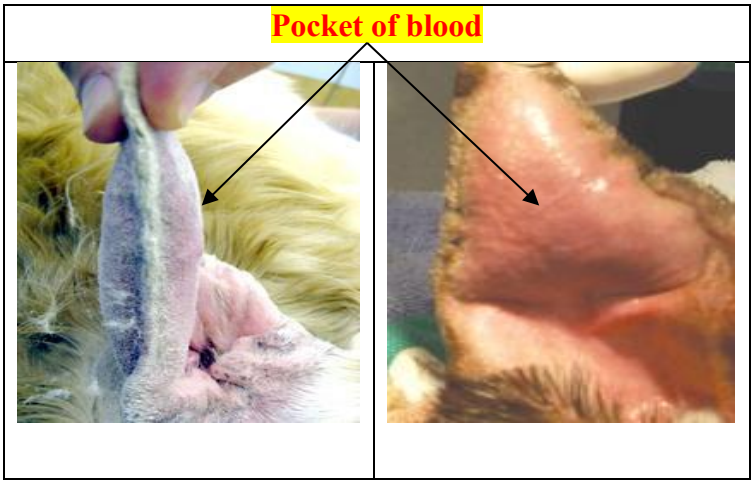
DOI:10.5281/ScienceWorld.18111425

What is an aural haematoma?

An ear hematoma is a pocket of blood that forms within the exterior portion of a dog's ear flap. Aural hematomas are the most common physical injury of the pinna, and they are most apparent on the pinna's concave surface. When dogs vigorously shake their heads or scratch their ears, trauma to the ears causes the blood vessels and capillaries in the pinna to rupture. When these vessels break, blood pools in the space between the skin and cartilage, creating a hematoma.

This condition is usually unilateral, but it can be bilateral. Hematomas should be drained as soon as possible. If they are left untreated, fibrin formation can occur, leading to fibrosis, contraction and thickening, potentially leaving the ear with a deformed cauliflower-like appearance.



Breeds susceptibility

The ear flap of dogs and (called the *pinna*) is made up of two sides of skin covered cartilage with blood vessels flowing down the centre. There is a wide variety of different ear shapes ranging from small,

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Published 18/12/2025

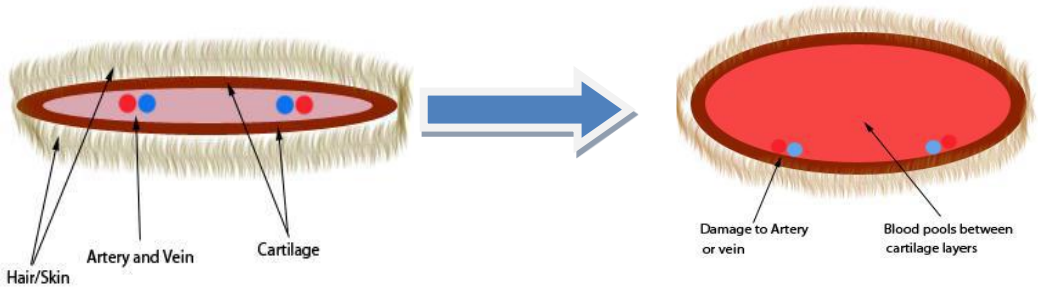
upright and pointy (such a Jack Russell), to medium and floppy ear (such as a Labrador) or long and pendulous ear (such as a Cocker Spaniel).

What causes an aural haematoma?

Ear hematomas are usually caused by some kind of self-trauma such as when a dog aggressively scratches at the ears or shakes his or her head, causing the ear flaps to slap against the skull. This trauma can cause blood to leave the vessels and pool in a pocket between the skin and cartilage components that make up the outer part of the ear flap. Usually, there's an underlying cause for the scratching and head shaking, such as ear mites or bacterial and/or yeast infections of the ear canal. Because dogs that suffer from skin allergies are prone to ear infections, allergic skin disease can be an important part of the underlying problem. It's undeniably crucial to treat both the ear hematoma and the underlying parasites or ear infection and address possible allergies. Golden Retrievers have a hereditary weakness of the ear and are very prone to developing haematoma.

Pathogenesis

In certain circumstances, the blood vessels can be damaged and this results in blood leaking from the blood vessels and into the surrounding tissue between the cartilages. The blood is not able to drain away and so as more blood leaks out, the further the cartilage becomes distended. This takes place until the pressure within the ear becomes high enough that it acts like a pressure bandage and physically stops the bleeding. This then leaves a heavy, fluid filled ear which is both painful and quite uncomfortable for the dog.



Symptoms and Identification

A dog with an ear hematoma will have a fluid-filled swelling on all or just part of the ear flap (called the "pinna"). Sometimes the swelling will seem firm, other times, soft and fluctuant. It may occlude the ear canal or simply involve the very tip of the ear.

A veterinarian can diagnose this condition during a physical exam. However, it is also important to diagnose underlying conditions that may lead to excessive ear scratching or head shaking. The veterinarian will most likely inspect the ear canal and swab it for a sample to examine under the microscope for signs of parasites or infection.

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Allergic skin disease (including inhalant allergies and food allergies) is probably the most common condition underlying this disease in dogs. Definitively diagnosing this possibility, however, is not as easy as identifying organisms under a microscope. Food trials (to investigate food allergies) and other kinds of allergy testing may be in order.

Surgical Anatomy of the Pinna

Before performing surgical aural hematoma repair, it is important to understand the anatomy of the pinna. The pinna receives blood from branches of the great auricular arteries, and the blood is returned through the auricular veins. The main vessels are located along the convex surface of the ear, and small branches pass through the cartilage to supply the concave surface with blood. The ear's sensory innervation is supplied by the second cervical nerve on the convex surface and the trigeminal nerve's auriculotemporal branches on the concave surface.

How are aural haematomas treated?

Auriculocentesis - this is where a needle is placed into the haematoma and the fluid/blood is drawn away completely into a syringe. Recurrence is common with needle drainage alone, even if bandages are applied, but treatment with systemic or intralesional steroids reduces recurrence. For needle drainage, the concave surface of the pinna should be clipped and aseptically prepared. A 14- or 16-gauge needle or 19- or 21-gauge butterfly catheter is inserted into the dependent portion of the hematoma and directed into the pocket For floppy-eared dogs, the needle is inserted into the end of the hematoma near the pinna apex so fluid draining from the needle hole does not enter the ear canal. Fluid is drained, and the pocket is flushed with sterile saline to remove clots. Steroids can be injected into the hematoma cavity before bandage placement.

Closed-Suction Drains - Closed-suction drainage using a butterfly catheter and vacutainer tube may inexpensively prevent or resolve SC fluid accumulation. In active patients, the tube and catheter must be carefully secured to prevent accidental needle dislodgement. The owner can be taught to change the vacutainer tube when it has filled or lost negative suction and to monitor fluid production. Drains are usually removed within 5 to 7 days of placement; the ear can be bandaged for another week to prevent disruption from head shaking or scratching. Closed-suction drainage works for acute or chronic hematomas that have fluid accumulation, as long as the underlying cause is treated. Most patients show resolution in 7 to 10 days with

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minimal pinna distortion. Recurrence rates are 22%, with recurrence reported in animals with uncontrolled allergic dermatitis.

Surgical repair of haematoma - Surgical repair is often considered the most effective treatment for ear hematomas. Surgery should be performed under general anesthesia using Xylazine @ 1 mg/kg and Ketamine @ 5 mg/kg I/V. Then animal was placed in lateral recumbency with affected ear upper side. The haematoma was opened on the concave side (fig. 1) on the most distal aspect of the haematoma with a stab incision through both skin and cartilage using a Bard-Parker scalpel handle with No. 11 blade until the serosangainous fluid was drained completely. Then 3 cm long incision was made and with gentle use of a curette, fibroangioblastic tissue was removed from the inner surface of the cartilage without causing additional bleeding. The blood clots and fibrin deposits on the cartilage were curetted with the help of curette (fig. 2). The cavity was thoroughly irrigated with betadine solution. About 1-2 mm thick skin flap was removed from the edges of the incision to create a gap between the edges of skin. Series of through and through horizontal interrupted mattress sutures were applied through entire thickness of ear flap on both side of the incision using silk 2/0 and were placed parallel to the incision with knots on the convex surface of the ear using nylon no.2 (fig. 3). The incised cutaneous edges were left unopposed for continued drainage. The sutures were placed over the entire surface of the haematoma and at least 5-7 mm wide, to avoid excessive tension on the underlying tissue, and not more than 5-7 mm apart. The sutures were tied on the convex side, where the skin and subcutis are thicker and thus more resistant to the pressure of the knots. Then pinna was totally dressed with betadine ointment. A tight protective pressure and absorbent bandage was applied over the ear and the ear was placed in dorsum of neck to prevent slipping of the bandage (fig. 4). An Elizabethan collar (a cone-shaped hood that fits over the pet's head) is often recommended so dog can't scratch at the ears. Sutures were removed after 15 days.

Post operative care

1. Dextrose saline 5% (500 ml) was administered continuously into the cephalic / saphenous vein during operation.
2. A course of antibiotic (Inj. Intacef 500 mg I/V) for 5 days and Inj. Meloxicam @ 0.5 mg/kg I/M for 3 days were administered.
3. Bandage should be changed every three days after antiseptic wound dressing of the operative site with betadine solution and lorexane ointment.
4. It should be advised to keep the animal in a clean house and not allowed to rub its head.

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Fig. 1: Before surgery

Fig. 2: Curetting the cavity

Fig. 3: After surgery

Fig. 4: Pressure bandaging

Punch biopsy technique –

The punch biopsy is also an appropriate option if the patient can tolerate general anesthesia. Begin by making two 1 to 2 cm transverse incisions at the distal and proximal edges of the hematoma to drain the fluid and remove the fibrin. Then use a 4 to 6 mm skin biopsy punch to make several drainage holes in the skin on the concave aspect of the pinna. Veterinarians should take care to remove skin only, leaving the cartilage intact. To prevent the punch from penetrating the cartilage, veterinarians can insert a sterile tongue depressor or other flat instrument through the distal drainage incision to hold the skin away from the cartilage. The drainage holes should be evenly distributed across the entire hematoma approximately10 to 15 mm apart. Leave these drainage sites open to heal by second intention, but tack the peripheral edge down to the cartilage using one simple interrupted suture persite.1 These sutures are placed through the skin on the concave surface and cartilage only or full thickness through the pinna. The sutures should be placed parallel to the blood vessels without tension, as described above, to avoid damaging the blood supply Finally, bandage the ear to the head. Both the incisional and punch biopsy techniques eliminate fluid, obliterate dead space and appose the skin of the concave.

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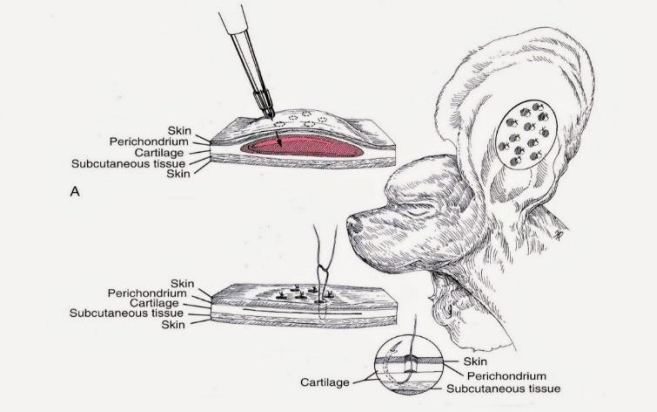

Laser technique-

The recent introduction of laser surgery to veterinary medicine has created another method of aural hematoma management. Use a CO2 laser to make one 1-cm incision in the skin for drainage and lavage. Then make multiple 1- to 2-mm incisions through the skin and cartilage over the entire hematoma that extends slightly beyond the edge of the hematoma. (Alternatively, small 4- to 6-mm holes can be made over the hematoma, similar to the punch biopsy technique.) These open lesions provide drainage while stimulating the tissues to adhere, and suturing is usually not necessary. These lesions will heal through second intention. Therefore, these techniques result in less recurrence and fewer complications than the nonsurgical drainage techniques.

Complications

The most common complications of aural hematomas are cosmetic alterations from delayed healing, recurrence from not properly addressing the underlying causes or not applying adequate sutures, or pinna damage from inappropriate suture placement. If sutures are placed perpendicular to the long axis of the pinna rather than parallel with it and the ascending branches of the great auricular artery are ligated, necrosis of the pinna can occur.

What is the prognosis?

Following surgery, the chance of recurrence is very low-but can occasionally occur. If your dog has suffered from an aural haematoma in one ear, then it is possible that the other ear may become affected at some point. This is particularly the case if there was no obvious trigger for the original problem.

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