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# AURAL HAEMATOMA ASSOCIATED WITH *ESCHERICHIA COLI* INFECTION IN AN ADULT NIGERIAN INDIGENOUS BREED OF DOG

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***ABSTRACT***

***A 4 year old bitch of Nigerian indigenous breed was presented to Miravet Clinic, Umuahia, Abia State, Nigeria with a complaint that the dog had a swelling on the right ear flap which made it inflict injuries on both ear flaps. Physical examination observed swollen right ear flap, dirty ear canals with foul smelling discharges. The owner had earlier treated this condition with Gentamycin ear drop without consulting any veterinarian. Based on the findings of physical examination, a tentative diagnosis of aural haematoma was made while laboratory findings incriminated Escherichia coli. The case was surgically managed with daily dressing of the open wounds. There was full recovery without recurrence up to 3 months post-operative follow up.***

***Keywords****: Aural Haematoma, Adult Indigenous Breed, Dog, Nigeria*

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## INTRODUCTION

An aural (ear) haematoma is a collection of blood or serum, and sometimes a blood clot between the skin and the cartilage of a pet's ear flap [1,2,3,4]. It's typically caused by overly aggressive ear scratching or head shaking that result from local irritation to some part of the ear. This excessive shaking cause the ear flap (called the pinna) to slap against the head thereby causing blood vessels to break and blood leave the vessels to pool in the pocket between the skin and the cartilaginous component that make up the outer part of the ear flap. This blood collects under the skin and causes the ear flap to become thickened. The swelling may involve only a small area or the entire ear flap [3].

The ear flap is composed of a layer of skin on each side of a layer of cartilage. The cartilage gives the ear flap its shape. Blood vessels go from side-to side by passing through the cartilage [5]. Violent shaking causes the vessels to break as the skin slides across the cartilage. Any reason that causes the dog to shake its head can result in the formation of an aural haematoma [6]. Other causes of aural haematoma include: grass seed or other foreign body lodged within the ear canal; bacterial and / or yeast infections of the ear canal; ear mites; allergies resulting in an itchy ear, scratching and shaking of the head and fly bites to the tips of the ears etc [6,7].



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Both dogs and cats can suffer from ear hematomas, although dogs, particularly those prone to skin allergies and ear infections, are more susceptible to the condition [6]. Aural haematoma develops easier in dogs with more pendulous ears, because the heavy ear flaps easily slap against the sides of the head during head shaking [6,3]. A pet with an ear hematoma will have a fluid-filled swelling on all or just part of the ear flap. Sometimes the swelling will seem warm, tense and painful while at other times they are soft and fluctuant [2,3]. It may occlude the ear canal or simply involve the very tip of the ear [3]. If the lesion is chronic, the seroma will slowly resorb and chronic scarring fibrosis which distorts the pinna will develop and result in a 'cauliflower ear' appearance [8,4].

**CASE PRESENTATION**

A 4 year old bitch of Nigerian indigenous breed was presented to a private veterinary clinic, Miravet Veterinary Clinic, Umuahia, Abia State, Nigeria on 17$^{th}$ July, 2017 with a complaint that the dog had a swelling on the right ear flap which made it to shake the head and scratch the ear and thus inflict injuries on the both ear flaps (Plate 1). It had foul smelling discharges from the ear canal.

The history revealed that the bitch was kept for security purposes. The bitch gets unleashed only at night and fed once daily on the family menu. The owner had treated the bitch with Gentamycin (Pauco, Nigeria) ear drop without consulting any veterinarian. However, the condition persisted and was neglected over a period of three months. The vaccination record was not up to date.

Upon clinical examination, the rectal temperature was 38.9 $^{0}$C, heart and pulse rates were 115 and 120 beats/minute respectively. There were wounds on the ear flaps; the right one swollen while both ear canals were very dirty. On the basis of the above observations, a tentative diagnosis of aural haematoma was reached with *otitis externa*, abscess, and trauma as the differential diagnoses.

**Plate 1: The left ear showing lesions from self-inflicted injuries (arrow).**

**Sample collection and Laboratory examinations**

Swabs were collected from both ear canals using sterile swab sticks for bacterial culture and sensitivity tests in the laboratory using Kirby-Bauer disc diffusion technique [9].

Laboratory results of the culture and sensitivity yielded heavy growth of *Eschericha coli* which was very sensitive to Ciprofloxacin, mildly sensitive to Tarivid but resistant to penicillin-streptomycin (Penstrep) combination, gentamycine, augmentin, ceporex, nalidixic acid septirn, ampicillin and reflacine (Table 1).

**Definitive Diagnosis**
Definitive diagnosis of aural haematoma due to *Escherichia coli* infection was arrived at based on the results of the physical examination of the ear flap, aspiration and examination of the fluid and laboratory analysis of the samples collected.

**Table 1. Antibiotic sensitivity and resistance profile**

| Antibiotics | Level of sensitivity | | |
|---|---|---|---|
| | High | Moderate | Resistant |
| Ciprofloxacine | +++ | | |
| Tarivid | | ++ | |
| Streptomycin | | + | |
| Reflacine | | | - |
| Augmentin | | | - |
| Gentamycin | | | - |
| Ciporex | | | - |
| Naliixin | | | - |
| Septrin | | | - |
| Ampicilin | | | - |

**CASE MANAGEMENT**
The case was surgically managed. The ear flap was shaved, washed and disinfected using 0.5% Chlorhexidine solution. The bitch was sedated using Xylazine hydrochloride (VMD, Belgium) at 2 mg/kg body weight intra-muscularly after Atropine sulphate (Pauco, Nigeria) premedication at 0.2 mg/kg intramuscularly. Anaesthesia was achieved using Ketamine hydrochloride (Rotexmedica, Trittau, Germany) at 15 mg/kg intramuscularly.

The bitch was carefully restrained and positioned on right lateral recumbency and the left ear was draped aseptically. The ear canal was plugged with cotton wool while an S-shaped incision was made on the concave part of the ear flap over the haematoma. The serosanguinous fluid was drained and the haematoma cavity flushed with normal saline. Simple interrupted suture of size 2/0 silk was placed 5-10mm apart along the line of incision through both layers to hold them against each other (Plate 2). A small quantity of gauze was placed inside the haematoma cavity to help in drainage. The ear was flipped up and bandaged against the head to prevent head shaking and disruption of granulation during recovery. An improvised Elizabethan collar was placed on the neck of the dog to prevent it from mutilating the ear wound. Ciprofloxacin antibiotic tablets at 10 mg/ kg *per os* for seven days and intramuscular injection of piroxicam analgesic at a start dose of 0.3 mg/kg were administered postoperatively. The cotton wool plug in the ear canal was removed post-operatively while the gauze placed inside the haematoma cavity was gradually reduced in size during the post-operative care to allow granulation to take place until there was minimal drainage when it was totally removed. The bitch was monitored till recovery which was uneventful. The sutures were removed after 21 days post surgery during which the wound had healed (Plate 3).

**DISCUSSION**
*Escherichia coli,* a medium sized gram negative rod-shaped bacterium, can affect dogs, cats and humans and can spread from animal to human or person to person [10]. The bacterium is one of the most common types found in the world and it is a normal inhabitant of the lower gastrointestinal tract of all animals. However, under certain circumstances, this bacterium can also be responsible for causing disease. The harmless strains are part of the normal flora of the gut and can benefit their host by producing Vitamin K2

and preventing the establishment of pathogenic bacteria within the intestines [10]. *Escherichia coli* and related bacteria constitute about 0.1% of gut flora, and faecal-oral transmission is the major route through which pathogenic strains of the bacterium causes disease [10]. *Escherichia coli* has been reported as one of the aerobic bacteria flora of the canine middle ear [11]. Other gram negative organisms isolated from cases of canine *otitis externa* include *Pseudomonas*, *Proteus*, *Klebsiella* and *Pasteurella* species that were commonly seen in chronic cases of *otitis externa* [11].

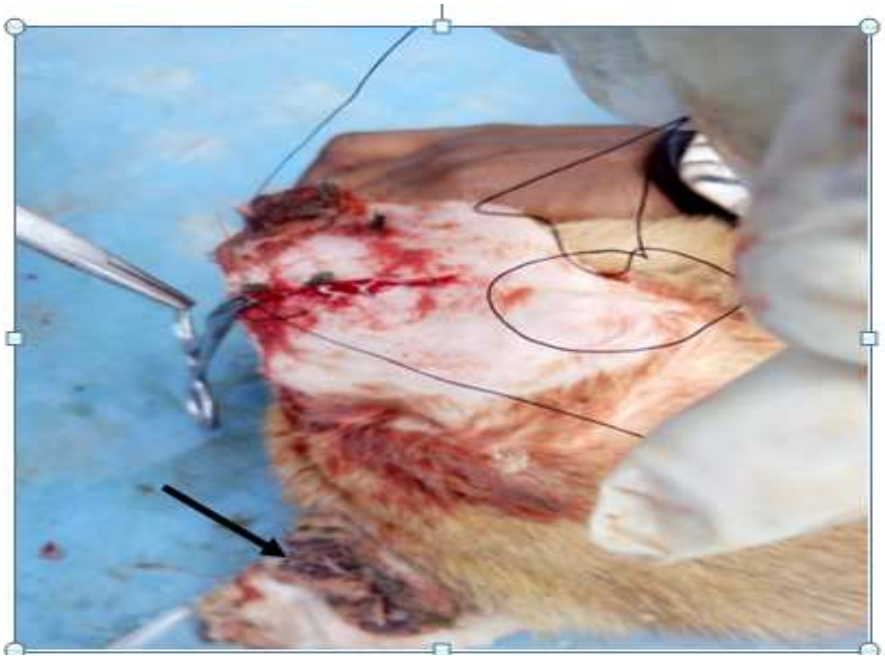

**Plate 2: Suturing of the right ear flap using 2/0 silk, Note the wounded left ear (Arrow)**

**Plate 3: The ear after the removal of stitches. Note the gradual healing of the open wound (arrowed).**

This case was as result of *E. coli* infection of the ear canal which manifested initially as discharge from both ears but was wrongly managed by the pet owner. The diagnosis of aural haematoma was established from the history and physical examination while the offending organism was ascertained from the laboratory result which revealed heavy growth of *E. coli*. The ear haematoma arose as a result of improper diagnosis and wrong management approach of an earlier infection. It is probable that the presence of the bacterium led to the irritation of the inner ear and constant shaking of the ear by the animal, hence the resultant rupture of the blood capillaries and subsequent blood accumulation between the ear skin and the cartilage.

Surgical management was resorted to because other conservative methods present with high recurrence rate [3,8]. An S-shaped incision, from the haematoma's distal edge to its proximal edge running parallel to the margins of the pinna, was made in order to drain all the accumulated fluid between the skin and auricular cartilage. Simple interrupted suture was used to avoid the likelihood of ligating a major blood vessel and the possibility of interrupting blood supply. While knotting, uniform pressure was maintained on the suture using the thumb to avoid any wrinkle formation on the skin and pocketing.

Chlorhexidine gluconate (0.5 %) was used for preoperative skin preparation to prevent infection and therefore increase the rate of healing. The ear was bandaged to facilitate drainage and prevent mutilation of the wound. Piroxicam, a non-steroidal anti-inflammatory drug was administered as an analgesic and anti-inflammatory to reduce pain and possibility of thickening of the pinna post-operatively. The sensitivity of the organism to Ciprofloxacin agreed with previous works by other researchers [12,13,14,15] who also recorded high resistant rates of *E. coli* to erythromycin, amoxicillin and tetracycline. Kibret and Abera [16] in their work also recorded multiple antimicrobial resistance and increased resistance rates to all antimicrobial by *E. coli* except ciprofloxacin. Resistance of a high proportion of gram negative bacteria to cephaloxin, cotrimoxazole, ampicillin, gentamycin and nalidixic acid has been reported in South-eastern Nigeria [17]. The laboratory result obtained from this case agrees with this report. Ciprofloxacin tablet was chosen against the injectable for ease of administration by the owners who find it difficult to restrain the bitch.

The laboratory results showed that the causative organism was resistant to Gentamycin, the drug earlier used by the client. This emphasizes the importance of proper laboratory diagnosis to the clinician and the danger of self medication by the pet owners. The prognosis of the case was good because the wound healing was uneventfully successful and the sutures were removed after 21 days following adequate tissue apposition. The self-inflicted injuries were debrided and managed as open wounds using a multi action skin gel (Charmil®) and daily dressing. The gauze plug inside the haematoma cavity was gradually reduced in size post-operatively to allow for normal granulation to take place until day 3 post-operatively when there was minimal drainage from the cavity, while the cotton wool plug in the ear canal was removed on post-operative day 2.

In conclusion, therefore, this case of aural haematoma was successfully managed by surgical intervention while laboratory examination of the swab samples helped to pinpoint the offending organism which in turn aided in the choice of antibiotic so as to reduce the issue of antibiotic resistance thus preventing recurrence up to 3 months post-treatment.

**RECOMMENDATIONS**

From the above case, it is therefore recommended that pet owners should seek professional advice when they notice strange conditions on their animals instead of resorting to self medication. Secondly, the usefulness of early discovery and prompt intervention buttressed by the right diagnostic approach cannot be over emphasized.

**REFERENCES**


1. Harvey, R. (2001). *Ear diseases of dogs and cats*. First edn., Manson Publishing Ltd., London, United Kingdom. 177 – 180.
2. Giles, W. C., Iverson, K. C., King, J. D., Hill, F. D., Woody, E. A. and Bouknight, A. L. (2007). Incision and drainage followed by mattress suture repair of auricular haematoma. *Laryngoscope*, 117 (12): 2097 - 2099.
3. Brown, C. (2010). Surgical management of canine aural haematoma. *Laboratory animals (New York)*, 34 (4): 104 - 105.
4. Roy, S. and Smith, L. P. (2010). A novel technique for treating auricular haematomas in mixed ultimate fighters. *American Journal of Otolarygology*, 31 (1): 21 - 24.
5. Vuyk, H. D. and Bakkers, E. J. (1991). Absorbable mattress in the management of auricular haematoma. *Laryngoscope,* 101(10): 1124 – 1126.
6. Joyce, J. A. and Day, M. J. (1997). Immunopathogenesis of canine aural haematoma: a case history. *Journal of Small Animal Practice,* 38 (4): 152 - 158.
7. Blattler, U. (2007). Fibrin sealant as a treatment for canine aural haematoma: a case history. *Veterinary Journal*, 173 (3): 697 - 700.
8. Romatowski, J. (1994). Non-surgical treatment of aural haematomas. *Journal of the American Veterinary Medical Association,*. 204 (9): 1318 - 1322.
9 Jorgensen, J.H., and Turnidge, J.D. (2007). Susceptibility test methods: dilution and disk diffusion methods p. 1152-1172 in Murray, P.R., Baron, E.J., Jorgensen, J.H., Landy, M. L., and Pfaller, M. A. Manual of Clinical Microbiology 9th ed. ASM Press, Washington, D.C.
10. Kate, S. K. (2011). Managing the *Escherichia coli* UTI. *Clinicians Brief Journal,* 5 (3): 243 - 254.
11. Daniel, O. M., Meghan, F. D., Brian, S. P., Kathleen O. and Shelley, C. R. (2017). Molecular and epidermiological characterization of canine pseudomonas otitis using a prospective case control study design. *Advances in Veterinary Dermatology,* 6: 133 - 140.
12. Chatterjee, J. S. (2005). A critical review of irrigation techniques in acute wounds. *International Wound Journal*, 2(3): 258 - 265.
13. Tesfaya, G., Asrat, D., Woldeamanuel, Y. and Gizaw, M. (2009). Microbiology of the discharging ears in Ethiopia. *Asian Pacific Journal of Tropical Medicine,* 2(91): 60 - 67.
14. Wariso, B. A. and Ibe, S. N. (2006). Bacteriology of chronic discharging ears in Port Harcourt, Nigeria. *West African Journal of Medicine,* 25: 219 - 222.
15. Bharathi, M. J., Ramakrishnan, R., Meenakshi, R. and Palaniappan, R. (2002). *In-vitro* efficacy of antibacterials against bacterial isolates from corneal ulcers. *Indian Journal of Ophthalmology,* 50: 109 - 114.
16. Kibret, M and Abera, B. (2011). Antimicrobial susceptibility patterns of *Escherichia coli* from clinical sources in North East Ethiopia. *African Health Science,* 11(1): 540 - 545.
17. Chah, K. F., Eze, C. A. and Oluoha, B. N. (2004). Frequency and antimicrobial resistance of aerobic bacteria isolateted from surgical sites in humans and animals in Nsukka, South East Nigeria. *Nigerian Veterinary Journal* 24(1): 1-7.