

Aural Hematomas in Small Ruminants – Clinical Features, Surgical Treatment and Outcome

Antônio Carlos Lopes Câmara¹, Haiane Arruda Luz Amorim¹,
Rita de Cássia Campebell¹ & José Renato Junqueira Borges¹

ABSTRACT

Background: Aural or auricular hematoma is an important and prevalent surgical condition in small animals practice, and commonly reported in companion pets. The condition is characterized by blood accumulation between the pinna's dermal surface and the underlying perichondrium. In farm animals, most cases present surgical treatment with drainage of serosanguineous fluid from acute cases with clinical evolution ranging from 1 to 5 days. Therefore, the present work reports the clinical features, surgical treatment and outcome of aural hematomas in 3 small ruminants with a chronic evolution (7 to 20 days), detailing the post-surgical complications, such as wound infection and recurrence, and final cosmetic appearance of the pinnae.

Cases: Upon physical examination, all animals were alert and presenting a good body condition score. Clinical alteration was restricted to a bilateral (Case 1) or unilateral (Cases 2 & 3) painless, and fluid-filled swelling, presenting doughy consistency masses within the fluid during pinna manipulation. The fluid-filled swellings were located on the concave (Case 1 - left ear & Case 2) and convex (Case 1 - right ear & Case 3) surface of the pinna. No primary pruritic disorders of the pinna were detected, and a diagnosis of traumatic aural hematoma was proposed. Due to the chronicity of the cases, surgical approach was advisable. The small ruminants underwent general anesthesia, and a linear incision over the skin overlying the hematoma was performed (Cases 1 & 2). After removal of blood and fibrin clots, the cavity was flushed and captionated size 0 nylon mattress sutures were performed on either side of the incision, in order to obliterate the dead space. Due to recurrence after 14 days, Case 2 was submitted to a modified surgical approach using a S-shaped incision combined to multiple drainage holes (MDH) using a disposable 6 mm biopsy punch. The same approach has performed in Case 3. Then, size 0 nylon mattress sutures followed by a tight protective pressure and absorbent bandage combined with an Elizabethan collar was applied. Postoperatively, Case 1 presented surgical site infection and the antibiotic was changed after bacterial culture and antibiogram results. Hospital discharge varied from 14 to 19 days' post-surgery. All animals presented some degree of ear retraction and a linear or S-shaped scar on the affected ear, but final cosmetic appearance was satisfactory to all owners.

Discussion: Aural or auricular hematomas are a frequent disorder in dogs and cats clinical practice. In sheep, the few reported cases have been associated with pruritic disorders of the pinna, such as ticks infestation and sarcoptic mange. Whilst in goats, traumatic injuries, such as ear tagging and trauma from others goats, are considered the main cause, especially in breeds with pendulous ear. In our cases with chronic evolution (> 7 days), the most important clinical feature was the presence of doughy consistency masses within the fluid, suggesting matured blood and fibrin clots. A linear incision with captionated size 0 nylon mattress sutures was associated to post-surgical complications, such as wound infection and aural hematoma recurrence. Therefore, a S-shaped incision associated to creation of MDH, in order to achieve better drainage, was the chosen approach in the second surgery (Case 2) and on the subsequent patient (Case 3). To the best of our knowledge, this is the first report using the MDH approach in farm animals, that appears to be an effective treatment for chronic aural hematomas in small ruminants.

Keywords: auricular hematoma, biopsy punch, goats, sheep.

DOI: 10.22456/1679-9216.129249

Received: 13 January 2023

Accepted: 23 May 2023

Published: 4 July 2023

Hospital Escola de Grandes Animais, Faculdade de Agronomia e Medicina Veterinária, Universidade de Brasília (UNB), Brasília, DF, Brazil. CORRESPONDENCE: A.C.L. Câmara [aclcamara@yahoo.com.br]. Hospital Escola de Grandes Animais, Área Especial SRB, Galpão 4. Granja do Torto. CEP 70636-200 Brasília, DF, Brazil.

INTRODUCTION

Aural or auricular hematoma is an important and prevalent surgical condition in small animals practice, and commonly reported in companion pets [4,8]. The condition is characterized by blood accumulation between the pinnae's dermal surface and the underlying perichondrium [6]. Typically, it is located at the concave surface of the pinna and is usually presented as a fluctuant swelling. Most common cause of aural hematomas is self-inflicted trauma by scratching and especially by head-shaking, usually as a consequence of otitis externa. Intense pruritus is the leading sign previous to hematoma formation, and may be consequence of parasitic infestation (ticks or mange), foreign bodies, otorrhoea, allergic dermatitis, polyps or neoplasms [4,13,14]

In farm animals, there are case reports of aural hematoma affecting sheep [9,13], goats [3,6,7,12], buffaloes [14], pigs [10], and horses [1]. Most cases present surgical treatment with drainage of serosanguineous fluid from acute cases with clinical evolution ranging from 1 to 5 days [3,6,7,10]. Therefore, the present work reports the clinical features, surgical treatment and outcome of aural hematomas in 3 small ruminants with a chronic evolution (7 to 20 days), detailing the post-surgical complications, such as wound infection and recurrence, and final cosmetic appearance of the pinnae.

CASES

Epidemiological data, clinical evolution, complications and outcome in three cases of aural hematoma affecting three small ruminants are presented in Table 1.

Case 1. A 2-month-old and 18 kg male Dorper lamb. According to the owner, the flock was released on a paddock for grazing native pasture during the day; and at night, the animals were housed indoors.

Case 2. A 4-year-old and 80 kg Dorper ram. The ram was raised semi-extensively with three others rams, that were used in pairs in each breeding season. On both farms (Case 1 & 2), there was no attempt of treatment and the animals were referred after clinical evolution of 20 and 8 days, respectively.

Case 3. A 5-year-old and 55 kg Saanen goat from a high-yield milk flock. The doe was recently moved to a new stall with other 4 goats, and a few days later presented the ear swelling, that was drained twice

by the owner at the property. After the third recurrence, the doe was referred for hospital care after 7 days of clinical evolution.

Upon physical examination, all animals were alert and presenting a good body condition score. Clinical alteration was restricted to a bilateral (Case 1) or unilateral (Cases 2 & 3) painless, and fluid-filled swelling, presenting doughy consistency masses within the fluid during pinnae manipulation. The fluid-filled swellings were located on the concave (Case 1 - left ear & Case 2) [Figure 1A] and convex (Case 1 - right ear & Case 3) [Figures 1B & 2A] surface of the pinna. No signs of scab formation, ticks or otitis was detected after careful otoscopic examination. Based on these findings, a diagnosis of traumatic aural hematoma was proposed. Surgical approach was advisable due to the chronicity of the cases, especially because of the doughy consistency masses on the pinnae, suggesting blood or fibrin clots.

Pre-operative laboratory tests included hematology (complete blood count and fibrinogen determination) and serum biochemistry (total protein, albumin, globulin, urea and creatinine levels, as well as aspartate aminotransferase and gamma-glutamyl transferase activities). Biochemical abnormalities were restricted to hypoalbuminemia (2.7 g/dL; reference range: 3.03-3.55 g/dL) in the Saanen doe (Case 3) [5]. All the other parameters were within reference range for the specie [5,11].

After pre-medication with 2% xylazine hydrochloride¹ [0.2 mg/kg - intramuscularly (IM)] and morphine² [0.2 mg/kg - IM], induction was obtained with propofol³ [5 mg/kg - intravenously (IV)]. Orotracheal intubation was performed, and general anesthesia maintained using 1.3 minimum alveolar concentration (CAM) of isoflurane and 50 mL/kg of 100% oxygen flow in a semi-closed circuit. After routine surgical preparation, the auriculotemporal and major auricular nerves were blocked with lidocaine⁴ (0.6 mg/kg). The first 2 sheep (Cases 1 & 2) were submitted to the same surgical approach, with a linear incision over the skin overlying the hematoma on the concave (Case 1 - left ear & Case 2) and convex (Case 1 - right ear) surface of the pinna. A large amount of blood and fibrin clots were removed with the aid of hemostats forceps (Figures 1B & 1C), and the cavity was flushed with abundant 0.9% saline solution [9]. Afterwards, captionated size 0 nylon mattress sutures were performed on either

side of incision in order to obliterate the dead space. A tight protective pressure and absorbent bandage was applied over the ear(s). Case 2 presented recurrence of the aural hematoma after 14 days of surgery. Then, the secondary treatment after recurrence from Case 2 and Case 3 (first surgery) were submitted to a modified surgical approach. A S-shaped skin incision over the skin on the concave (Case 2) and convex (Case 3) surface of the pinna was performed (Figure 2A). Multiple drainage holes (MDH) [7 fragments of the ear skin] were removed using a disposable 6 mm biopsy punch [4,8]. Then, closer size 0 nylon mattress sutures were applied to avoid recurrence (Figure 2C). Again, a tight protective pressure and absorbent bandage was applied over the ear combined with an Elizabethan collar to prevent self-inflicted trauma (scratching) [Figure 2D].

Postoperatively, the animals received broad spectrum antibiotic⁵ [ceftiofur - 2.2 mg/kg - IM, once a day [s.i.d.], for 7 days] therapy. Anti-inflammatory⁶ [flunixin meglumine - 2.2 mg/kg - IV, s.i.d., 5 days] and analgesic⁷ [dipyrone - 25 mg/kg, IM, twice a day, 5 days] therapy was also performed. Surgical wounds were dressed daily with diluted (1:100) iodopovidone solution, followed by healing ointment. Case 2 (after the 2nd surgery) and Case 3 evolved uneventfully and suture removal occurred on the 14th post-surgical day.

On the 5th post-surgical day, Case 1 presented surgical site infection on the right pinna, that was painful to manipulation and draining purulent discharge. A pus sample was collected and submitted to bacterial culture and antibiogram profile, yielding a cephalosporin-resistant *Staphylococcus* sp. Then, the antibiotic was changed to enrofloxacin⁸ [5 mg/kg - IM, s.i.d., for 14 days] combined with the aforementioned surgical wound dressing. After this, the recovery was uneventfully and hospital discharge occurred on the 19th post-surgical day. All animals presented some degree of ear retraction (Table 1), and a linear (Case 1) or S-shaped scar (Cases 2 & 3) on the affected ear, but final cosmetic appearance (Figure 3) was satisfactory to all owners.

DISCUSSION

Aural or auricular hematomas are a frequent disorder in dogs and cats clinical practice [4,8]. In sheep, the few reported cases have been associated with pruritic disorders of the pinna, such as ticks infestation [9] and sarcoptic mange [13]. Whilst in goats, traumatic injuries, such as ear tagging [7] and trauma from others goats [6,12], are considered the main cause, especially in breeds with pendulous ears [3,6,12]. In the present report, no underlying cause of

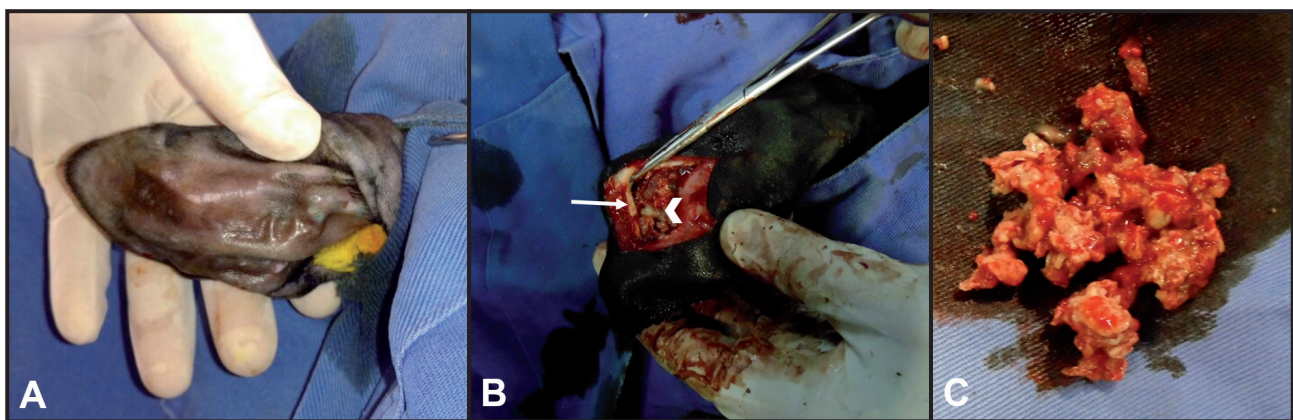


Figure 1. Aural hematoma in 2 Dorper sheep. A- Painless, soft and fluid-filled swelling located on the concave surface of the right pinna (Case 2). B- Intra-operative visualization of blood and fibrin clots (arrowhead) from the aural hematoma at the convex surface of the right ear. Note the thickened auricular cartilage (arrow) [Case 1]. C- Large amount of fibrin clots removed from the right pinna of Case 1.

Table 1. Epidemiological data, clinical evolution, complications and outcome in 3 cases of aural hematoma in small ruminants.

Case	Specie	Breed	Age	Weight (kg)	Clinical evolution	Affected ear(s)	Complications	Outcome
1	Sheep	Dorper	2-months	18	20 days	Both	Wound infection (right ear)	Right ear shrivel (++)
2	Sheep	Dorper	4-years	80	8 days	Right	Recurrent (2nd surgery)	Ear shrivel (+)
3	Goat	Saanen	5-years	55	7 days	Right	Drainage 2-times at property	Ear shrivel (+)

(+) Discrete; (++) Moderate.

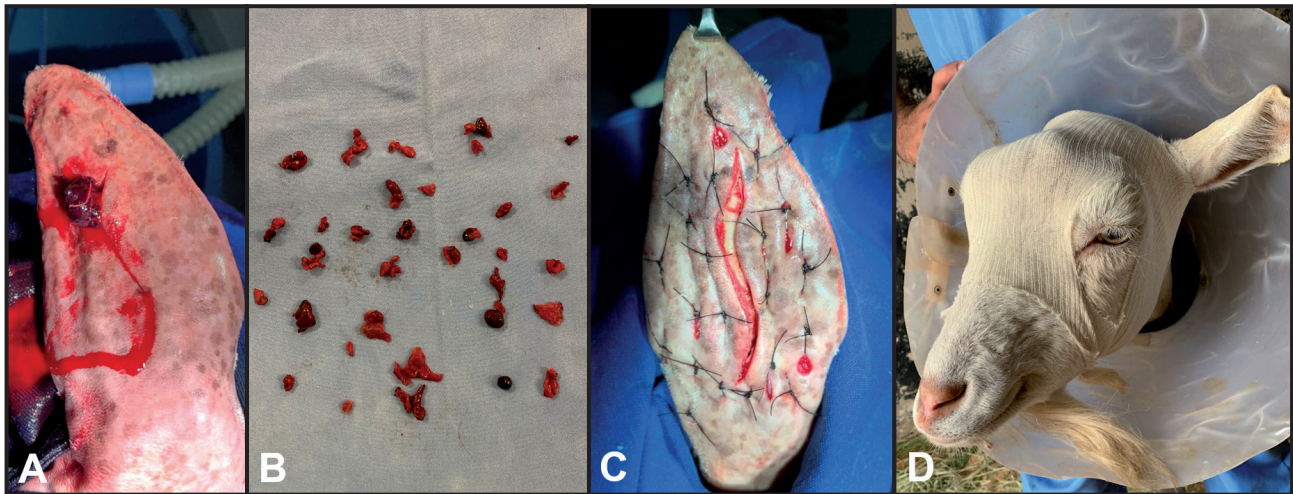


Figure 2. Aural hematoma in a Saanen doe (Case 3). A- S-shaped skin incision over the skin on the convex surface of the right pinna. Note the exteriorization of a blood clot. B- Blood and fibrin clots removed. C- Final post-surgical appearance. D- Tight protective pressure and absorbent bandage combined with an Elizabethan collar.

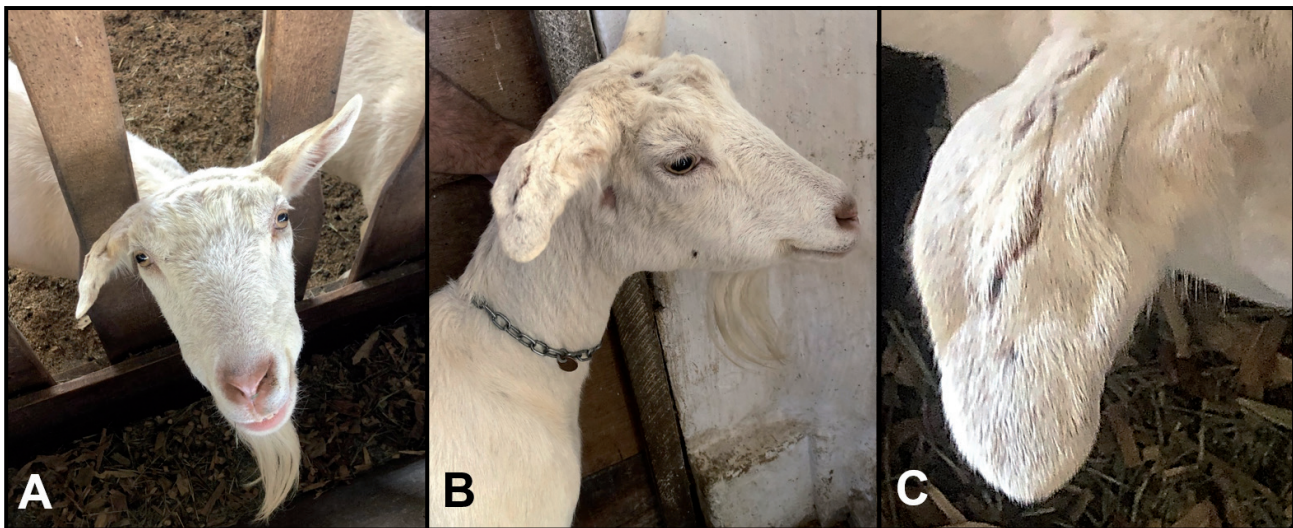


Figure 3. Cosmetic appearance 4-years after surgery (Case 3). A- Frontal view of the Saanen doe. Note that the right ear is droopier when compared to the contralateral one. B- Lateral view of the Saanen doe. C- Closer view of the right pinna showing a discrete ear retraction and a S-shaped scar.

ear pruritus was identified, thereby, aural hematomas from traumatic origin was the presumptive diagnosis. Herein, we hypothesized that trauma, especially biting from adult sheep to discourage nursing (Case 1) and fights among rams in the breeding season (Case 2), was the most probable cause. Case 3 was a high-producing Saanen doe recently moved to a new stall, thereby, it is believed that the dispute to establish the new social hierarchy could be the traumatic cause predisposing to the aural hematoma formation. Additionally, the conformation of the feeders may also increase the chance for pinnae trauma (Figure 3A).

Clinical signs presented by the 3 small ruminants herein were similar to previous reports of aural hematoma affecting sheep [9,13] and goats [3,6,7,12]. Although, most reports were from acute cases with

clinical evolution of 5 days at the most [3,6,7], and on our cases with chronic evolution (> 7 days), the most important feature was the presence of doughy consistency masses within the fluid, suggesting matured blood and fibrin clots. This was the crucial finding for the choice of surgical approach, since clinical treatment, accomplished by needle drainage and corticosteroids infusion directly to the lesion, is recommended in cases with a maximum evolution of 24 h [4]. After drainage, a compression bandage may be applied to avoid recurrence [7,14].

The purpose of surgical intervention is to remove the blood and fibrin clots, and to press the layers of auricle together to eliminate dead space and minimize hematoma recurrence [1,4,7-9,14]. If left untreated, the auricle will shrivel and subsequent ossification

of the cartilage will cause continuous irritation [3]. Additionally, the fibrin present in the subcutaneous edema induces fibroblast proliferation and interstitial fibrosis; subsequently, due to the effect of myofibroblast contraction, there is bending of the pinna [2].

The use of 2 small surgical incisions for placement of a Penrose tube (tube drainage technique) can be successfully performed for aural hematomas containing only serous material without fibrin [13], as previously reported in a 3-day goat kid [6]. For chronic cases, especially if a large amount of fibrin and/or blood clots are present, surgical drainage by a linear or S-shaped incision is considered the most effective treatment [1,3,7,9,10,12-14]. In the present report, the linear incision associated with captioned size 0 nylon mattress sutures was performed in 1 lamb (Case 1) bilaterally, that present unilateral surgical wound infection during hospitalization. In Case 2, the same surgical approach evolved to aural hematoma recurrence. Therefore, the chosen secondary treatment after recurrence

was a S-shaped incision associated to creation of MDH using a biopsy punch [4,8], allowing a more effective drainage. Due to the good postoperative evolution, the same approach was performed in Case 3, that had a complete and uneventful recovery.

To the best of our knowledge, this is the first report using the MDH approach in farm animals, that appears to be an effective treatment for chronic aural hematomas in small ruminants.

MANUFACTURERS

¹Syntec do Brasil. São Paulo, SP, Brazil.

²Hipolabor Pharmaceuticals. Belo Horizonte, MG, Brazil.

³União Química Farmacêutica. Brasília, DF, Brazil.

⁴Hypofarma. Ribeirão das Neves, MG, Brazil.

⁵Eurofarma Laboratórios. Ribeirão Preto, SP, Brazil.

⁶Ceva Saúde Animal. Paulínia, SP, Brazil.

⁷Zoetis Indústria de Produtos Veterinários Ltda. Campinas, SP, Brazil.

⁸Chemitec Produtos Veterinários. São Paulo, SP, Brazil.

Declaration of interest. The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

REFERENCES

- 1 Boorman S., Boone L.H. & White A. 2021.** Clinical features, treatment, and outcome of aural hematomas in horses: 7 cases (2008-2019). *Journal of the American Veterinary Medical Association*. 258(6): 654-660. DOI: 10.2460/javma.258.6.654
- 2 Caldas S.A., Graça F.A.S., Barros J.S.M., Rolim M.F., Peixoto T.C. & Peixoto P.V. 2013.** Lesions caused by Africanized honeybee stings in three cattle in Brazil. *Journal of Venomous Animals and Toxins including Tropical Diseases*. 19: 18. DOI: 10.1186/1678-9199-19-18
- 3 Dewangan R., Sharda R. & Kalim M.O. 2016.** Surgical management of extensive aural haematoma in a Jamunapari goat. *International Journal of Science, Environment and Technology*. 5(4): 2221-2225.
- 4 Itoh T., Kojimoto A., Kojima K., Mizawa K. & Shii H. 2022.** Surgical creation of multiple drainage holes versus local injection of corticosteroids for treatment of aural hematomas in dogs: 51 dogs with 71 aural hematomas (2000-2017). *Journal of the American Veterinary Medical Association*. 260(S1): 15-23. DOI: 10.2460/javma.20.12.0672
- 5 Kaneko J.J., Harvey J.W. & Bruss M.L. 2008.** *Clinical Biochemistry of Domestic Animals*. 6th edn. San Diego: Academic Press, pp.117-156.
- 6 Katsoulos P.D. & Dedousi A. 2021.** Surgical management of bilateral ear pinna lesions associated with traumatic aural hematoma in a 3-day-old goat kid. *Open Veterinary Journal*. 11(3): 379-384. DOI: 10.5455/OVJ.2021.v11.i3.7.
- 7 Kumaresan A., Dharmaceelan S. & Sidhan R. 2017.** Surgical management of aural haematoma in a goat. *Intas Polivet*. 18(2): 263-264.
- 8 Kuroki K., Nagaoka K., Nakayama K. & Kaneko T. 1997.** Surgical treatment of aural hematoma using biopsy punch. *Japanese Journal of Veterinary Anesthesia & Surgery*. 28(4): 95-101.
- 9 Lamani T.S.D., Kamalakar G., Sunil C.L., Murthy K.M.S. & Nagaraja B.N. 2019.** Surgical management of aural haematoma resultant of tick infestation in a non-descript sheep – a case report. *International Journal of Livestock Research*. 9(12): 224-227. DOI: 10.5455/ijlr.20190917044914
- 10 Raidurg R. & Revanna P.S. 2015.** Aural haematoma in a Yorkshire pig - a case report. *Indian Veterinary Journal*. 92(5): 72-73.
- 11 Stayt J. 2020.** Hematology of sheep and goats. In: Brooks M.B., Harr K.E., Seeling D., Wardrop K.J. & Weiss D.J. (Eds). *Schalm's Veterinary Hematology*. 7th edn. Hoboken: Jon Wiley & Sons, pp.1012-1018.

- 12 **Singh P., Bansal K. & Singh Y. 2015.** Aural haematoma in Beetal buck (male goat): a case report. *Veterinary Practitioner*. 16(1): 144-145.
- 13 **Tsioli V., Farmaki R., Papastefanou A., Galatos A.D., Marinou M., Tontis D., Mavrogianni V.S., Doukas D., Sardi-michelakis M.N. & Fthenakis G.C. 2013.** A case of bilateral auricular haematoma in an ewe-lamb with sarcoptic mange. *Small Ruminant Research*. 110(2-3): 145-149. DOI: 10.1016/j.smallrumres.2012.11.023
- 14 **Vishwakarma R.K. 2018.** Surgical management of aural haematoma in a buffalo calf. *Intas Polivet*. 19(1): 74-75.