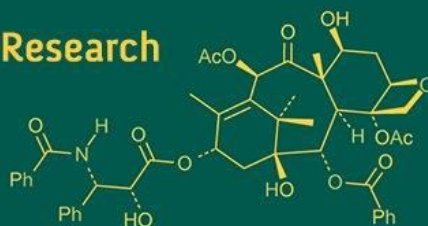


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Comparative outcomes of surgical and conservative management of canine aural haematoma

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Abstract

Aural haematoma is a common auricular condition in dogs, mostly concurrent to underlying auricular affection like otitis externa, allergic dermatitis, any ecto-parasitic infestation etc. This retrospective study compared the clinical efficacy of surgical intervention with a conventional medical protocol using *Arnica montana*, *Hamamelis virginica* and topical heparin ointment in dogs with aural haematoma. Clinical records of 20 dogs were analysed and cases were categorized based on treatment modality and haematoma extent. Surgical management resulted in complete resolution in all cases without documented recurrence. Conventional medical management achieved resolution in 50% of cases, with treatment failure occurring predominantly in dogs with complete ear haematomas. Partial ear haematomas demonstrated a higher likelihood of favourable response to conservative therapy. These findings indicate that surgical intervention remains the most reliable and definitive treatment for canine aural haematoma, while conservative management may be considered in carefully selected cases of localized disease.

Keywords: Haematoma, otitis, dogs, *Arnica montana*, *Hamamelis virginica*

1. Introduction

Aural haematoma, also referred to as otohaematoma or auricular haematoma, represents a common clinical presentation in small animal veterinary practice, characterized by the accumulation of serosanguineous fluid or blood between the auricular cartilage and the overlying perichondrium or skin of the pinna (Evangelista *et al.*, 2012; Silva *et al.*, 2018) [2, 17]. Although encountered less frequently in feline patients, the condition exhibits notably higher prevalence in the canine population, ranking among the most routinely performed surgical procedures in companion animal medicine (Graça, 2010; Valle *et al.*, 2015) [6, 21]. The pathogenesis typically involves traumatic disruption of auricular blood vessels secondary to vigorous head shaking or self-inflicted scratching, behaviours most frequently associated with underlying otological disorders including otitis externa, allergic dermatitis, ecto-parasitism or other pruritic conditions affecting the auricular region (Rodrigues *et al.*, 2016; Gheller *et al.*, 2017) [14, 4]. Predisposing anatomical factors include dogs possessing pendulous pinnae and geriatric patients demonstrating increased susceptibility, likely attributable to enhanced mechanical stress on vascular structures and age-related vascular fragility (Gothelf, 2004) [5].

The clinical progression of aural haematoma follows a characteristic biphasic course. The acute phase manifests with rapid swelling of the pinna due to rupture of branches of the caudal auricular artery and subsequent haemorrhage into the subcutaneous space, creating a fluctuant, blood-filled cavity of variable size and location, typically affecting the concave surface of the external ear (Evangelista *et al.*, 2012; Marignac, 2005) [2, 11]. During this initial stage, affected animals exhibit variable degrees of discomfort, head shaking and auricular pruritus. If left untreated, the condition progresses to a chronic phase characterized by fibrin deposition along the haematoma cavity walls, organization of the serosanguineous content and eventual transformation into granulation tissue (Krahwinkel, 2003; Matoussek, 2004) [8, 13]. This fibrotic remodelling process results in auricular cartilage thickening, permanent architectural distortion and the development of the characteristic "cauliflower ear" deformity, substantially compromising both aesthetic appearance and functional integrity of the pinna (Marignac, 2005) [11].

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While spontaneous resolution may occur through natural reabsorption mechanisms, the protracted time course and high probability of significant fibrotic sequelae make therapeutic intervention clinically advisable in most cases (Valle *et al.*, 2015) [21].

Conventional management strategies for canine aural haematoma have traditionally emphasized surgical intervention as the definitive treatment modality. Numerous surgical techniques have been described in the veterinary literature, including linear or S-shaped incisions with placement of tension-relieving mattress sutures, creation of multiple drainage fenestrations, insertion of indwelling drains and various stenting methodologies designed to eliminate dead space and facilitate adhesion between cartilage and overlying integument (Schossler *et al.*, 2007; Johnson *et al.*, 2015; MacPhail, 2016) [16, 7, 10]. These approaches generally demonstrate favourable outcomes with respect to recurrence prevention; however, they necessitate general anaesthesia or deep sedation, entail inherent perioperative risks and may be associated with postoperative complications including surgical site infection, suture-line dehiscence, prolonged healing times and variable cosmetic results (Schossler *et al.*, 2007) [16]. Such considerations assume particular clinical relevance when treating geriatric patients, animals with concurrent systemic disease, or cases where owner financial constraints or aversion to surgical procedures present barriers to conventional management.

In light of these limitations, alternative therapeutic modalities have been explored, albeit with inconsistent success rates. Conservative approaches such as repeated needle aspiration, with or without concurrent administration of intralesional corticosteroids, have yielded variable outcomes and are frequently complicated by high recurrence rates attributable to inadequate dead space obliteration (Kuwahara, 1986; MacPhail, 2016) [9, 10]. Emerging regenerative medicine approaches, including platelet-rich plasma therapy, have been reported in isolated case series, though robust evidence supporting their efficacy remains limited.

Homeopathic and botanical preparations have been employed in various clinical contexts, with growing documentation of their potential utility in managing inflammatory and haemorrhagic conditions ((Busnardo *et al.*, 2023; Valle *et al.*, 2020; Valle and Carvalho, 2020) [1, 18, 20]. *Arnica montana*, a well-established botanical agent in both human and veterinary applications, possesses documented anti-inflammatory, anti-oedematous, and anti-ecchymotic properties and has demonstrated capacity to stimulate extracellular matrix gene expression in wound-healing phenotypes (Marzotto *et al.*, 2016) [12]. *Hamamelis virginica* exhibits recognized haemostatic, venotonic and vasoprotective activities that may theoretically facilitate resorption of extravasated blood and minimize secondary vascular leakage (Valle *et al.*, 2015) [21]. Furthermore, topical heparin preparations have been utilized to promote fibrinolysis and prevent organization of haematoma contents, potentially limiting progressive fibrosis (Santos, 2014) [15]. Several case reports and small clinical series have described favourable therapeutic outcomes following treatment of canine aural haematoma with *Arnica montana* and *Hamamelis virginica*, either as monotherapy or in combination with topical agents, documenting satisfactory clinical resolution and preservation of normal auricular conformation without requirement for surgical intervention (Valle and Carvalho, 2020, 2021) [18, 20, 21].

Given the substantial prevalence of aural haematoma in canines, the economic implications and animal welfare considerations associated with surgical management and the idea of minimally invasive and integrative therapeutic options, there is a need for systematic, controlled evaluation of alternative treatment modalities. The present study was therefore designed to prospectively compare the clinical efficacy, safety and outcome parameters of *Arnica montana* and *Hamamelis virginica* combined with topical heparin ointment versus surgical intervention in the management of naturally occurring aural haematomas in dogs. By employing standardized assessment criteria for clinical resolution, recurrence rates, treatment duration and cosmetic outcomes, this investigation aims to provide evidence-based data to inform rational therapeutic decision-making and expand the available treatment options for this common clinical condition.

Materials and Methods

Study design

This study was conducted as a retrospective clinical record analysis of dogs diagnosed with aural haematoma and presented to Pet Animal Medical Centre, Panchkula during the study period. The investigation aimed to compare outcomes of surgical management with those of conventional medical management using *Arnica montana*, *Hamamelis virginica* and topical heparin ointment. A total of 20 dogs presented with ear haematoma were randomly divided in two equal groups according to the treatment approach documented in the clinical records:

Surgical management group (n = 10): Dogs that underwent surgical evacuation of the haematoma with techniques aimed at eliminating the dead space between the auricular cartilage and skin, as per standard surgical practice.

Conventional medical management group (n = 10): Dogs managed non-surgically using *Arnica montana* and *Hamamelis virginica*-10 drops each, orally twice daily for a period of 2-4 weeks in combination with topical heparin ointment applied to the affected pinna. In dogs where conventional management failed, subsequent surgical intervention and final outcomes were recorded.

For each case, the following data was recorded: breed, age, sex, type of aural haematoma, treatment modality and treatment outcome.

Aural haematomas were categorized as complete or partial based on recorded descriptions of the extent of auricular involvement.

Treatment outcome was classified retrospectively based on follow-up records as:

Favourable: complete resolution of the aural haematoma without recurrence and without the need for additional intervention.

Non-favourable: persistence or recurrence of the haematoma necessitating surgical intervention.

Results

Case characteristics

A total of 20 dogs diagnosed with aural haematoma were included in the retrospective analysis. Dogs represented a range of breeds, ages and both sexes. Based on treatment records, 10 dogs (50%) underwent surgical management, while 10 dogs (50%) were initially managed using a conventional medical approach consisting of *Arnica montana*, *Hamamelis virginica* and topical heparin ointment.

Breed, age, and sex distribution

German Shepherd Dogs were the most frequently affected breed (6/20; 30%), followed by Labrador Retrievers (4/20; 20%) and indigenous Indian dogs (4/20; 20%). Other breeds included American Bully/Pitbull types (2/20; 10%), Shih Tzu (1/20; 5%), French Bulldog (1/20; 5%), and Lhasa Apso (1/20; 5%).

The age of affected dogs ranged from 7 months to 12 years (mean: 5.1 years). A male predominance was observed, with 14 males (70%) and 6 females (30%) represented in the study population.

Based on the extent of auricular involvement recorded in the case files, 11 dogs (55%) were classified as having complete aural haematomas, while 9 dogs (45%) had partial haematomas.

Within the surgical treatment group, 7 dogs (70%) had complete haematomas and 3 dogs (30%) had partial haematomas. In the conventional treatment group, 4 dogs (40%) had complete haematomas and 6 dogs (60%) had partial haematomas.

Treatment outcomes

Surgical management

All dogs managed surgically (10/10; 100%) showed

complete resolution of the aural haematoma, with no recurrence documented during the available follow-up period. Surgical management was therefore associated with a 100% favourable outcome rate.

Conventional medical management

Among dogs initially managed using the conventional medical protocol, 5 of 10 dogs (50%) achieved complete resolution of the haematoma without requiring additional intervention. The remaining 5 dogs (50%) showed persistence or recurrence of the haematoma and subsequently underwent surgical management, after which resolution was achieved.

Relationship between haematoma type and outcome

In the conventional treatment group, treatment failure was more frequently observed in dogs with complete haematomas. Of the five dogs that did not respond to conventional management, four (80%) had complete haematomas and one (20%) had a partial haematoma. Conversely, among the five dogs that responded favourably to conventional management, four (80%) had partial haematomas and one (20%) had a complete haematoma.

Relationship between haematoma type and outcome

Sr. No.	Breed	Age	Sex	Type of Haematoma	Treatment	Outcome	Remarks
1	German Shepherd	9y	M	Complete	Surgical	F	-
2	Lab	2y 6m	M	Complete	Surgical	F	-
3	Indie	11y 6m	F	Complete	Surgical	F	-
4	Shih tzu	3y	M	Partial	Surgical	F	-
5	German Shepherd	1y	M	Complete	Surgical	F	-
6	Pitbull	1y	M	Partial	Surgical	F	-
7	Indie	5y	F	Complete	Surgical	F	-
8	German Shepherd	6y	M	Complete	Surgical	F	-
9	German Shepherd	7y	M	Complete	Surgical	F	-
10	French bully	7 m	M	Partial	Surgical	F	-
11	Lab	3y	F	Partial	Conventional	F	-
12	German Shepherd	3y	M	Complete	Conventional	NF	Surgical intervention performed
13	Lab	9y	F	Partial	Conventional	F	-
14	Lhasa apso	12y	F	Partial	Conventional	F	-
15	Bully	1y	M	Complete	Conventional	NF	Surgical intervention performed
16	German Shepherd	6y	F	Partial	Conventional	NF	Surgical intervention performed
17	Indie	1y	M	Complete	Conventional	NF	Surgical intervention performed
18	Lab	6y 6m	M	Partial	Conventional	F	-
19	Indie	3y	F	Partial	Conventional	F	-
20	Indie	9y	M	Complete	Conventional	NF	Surgical intervention performed

Discussion

Aural haematoma is a common auricular disorder in dogs, typically resulting from vascular rupture within the pinna secondary to head shaking or scratching, often associated with otitis externa or other causes of auricular irritation (Fossum, 2007) [3]. Despite its frequent occurrence, optimal management remains debated due to variability in lesion extent, chronicity, and risk of recurrence.

In the present retrospective study, surgical management resulted in complete resolution in all treated dogs, with no recurrence documented during follow-up. This outcome is consistent with previous reports demonstrating that surgical techniques aimed at evacuating haematoma contents and eliminating the dead space between the auricular cartilage and skin provide predictable and durable results. Obliteration of dead space is considered fundamental to

surgical success, as it prevents re-accumulation of fluid and promotes uniform adhesion of tissue layers.

Conventional medical management using *Arnica montana*, *Hamamelis virginica* and topical heparin ointment achieved resolution in 50% of cases. Treatment response was influenced by the extent of auricular involvement, with partial ear-haematomas responding more favourably than complete ones. This finding is consistent with the pathophysiology of aural haematoma, as larger lesions are characterized by greater tissue separation, fibrin organization and vascular disruption, which limit the effectiveness of conservative therapy (Fossum, 2007) [3]. The partial success observed in this study suggests that conservative management may be considered in carefully selected cases of localized haematoma, particularly when surgical intervention is contraindicated or declined,

provided that close clinical monitoring is ensured (Busnardo *et al.*, 2023) ^[1].

Breed and demographic patterns observed in this study, including a predominance of medium to large breeds and male dogs, are consistent with earlier clinical observations. Increased ear mass, pendulous pinnae, breed predisposition to otitis and greater susceptibility to self-trauma may contribute to the aetiology.

The study results are suggestive that surgical intervention remains the most reliable definitive treatment for canine aural haematoma, particularly in complete ear-haematomas. Conservative medical management may be appropriate in selected cases of partial haematoma but carries a higher risk of treatment failure. Treatment decisions should therefore be individualized based on lesion extent, clinical severity and owner considerations.

Conclusion

This retrospective study confirms that surgical intervention offers consistent and definitive resolution of canine aural haematoma, particularly in complete ear-haematomas. Conservative management using *Arnica montana*, *Hamamelis virginica* and topical heparin ointment may be effective in selected cases of partial haematoma but carries a higher risk of failure. Treatment decisions should therefore be guided by lesion extent and clinical severity.

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