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Case Report

Multiple type Vb dermoid sinus in the parieto-occipital region of a Pomeranian dog

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ABSTRACT

Dermoid sinus (DS) is a rare congenital cutaneous malformation resulting from incomplete separation of the ectoderm from the neural tube during embryogenesis and is most commonly encountered in dogs along the dorsal midline. Atypical regional occurrences, including cranial localizations, are rare and may pose diagnostic and surgical challenges. This report describes a four-month-old male Pomeranian dog presenting with multiple progressive swellings within the parieto-occipital region of the head. Physical examination revealed firm, poorly demarcated masses without active drainage. Routine hematological and biochemical parameters were unremarkable. Surgical management consisted of complete excision of the lesions followed by reconstructive closure using a random-pattern advancement skin flap due to the extensive skin defect. Histopathological evaluation demonstrated a closed epithelial-lined lesion lacking communication with the epidermal surface, consistent with Type V DS, considering its localization within the parieto-occipital region of the head, the lesion was classified as subtype “b” (Type Vb DS). The postoperative course was uneventful, and no recurrence or wound healing issues were detected during the 12-month follow-up period. To the best of the authors’ knowledge, this represents the first documented report of Type Vb DS in a Pomeranian dog with detailed long-term postoperative follow-up. These findings emphasize the importance of thorough surgical excision and appropriate reconstructive planning when managing extensive DS lesions in atypical cranial regions.

Keywords: Dermoid sinus, Dog, Head, Pomeranian dog, Reconstructive surgery

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Introduction

Dermoid sinus (DS) is a skin malformation defined as a congenital ectodermal inclusion anomaly resulting from the incomplete separation of the ectoderm from the neural tube during embryonic development (1). This developmental abnormality has also been described as pilonidal sinus, pilonidal cyst, or dermoid cyst, depending on its clinical and morphological features (6). The condition has been reported in humans as well as in several animal species including horses, sheep, camels, cats, and dogs (13,15). Genetic predisposition is considered to play a significant role in the etiology of DS. In particular, an autosomal dominant mutation identified in the Rhodesian Ridgeback breed, associated with the dorsal ridge phenotype, has been shown to increase susceptibility to DS development in affected dogs (7). However, cases have also been reported in various other breeds including Dachshund, Great Pyrenees, Golden Retriever, Yorkshire Terrier, Chow Chow, French Bulldog, English Springer Spaniel, English Bulldog, Saint Bernard, Shih Tzu, Siberian Husky, Victorian Bulldog, Chinese Crested, and Swedish Vallhund (10,13). In addition, DS has been described in cats (10), and isolated cases without confirmed genetic predisposition have also been reported (13). DSs are classified by the depth of penetration into underlying anatomical structures. Types I–IV are defined

by their anatomical relationship to the supraspinous ligament and, in some cases, the spinal canal. Type V represents a closed epithelial-lined cyst without communication with the epidermal surface, whereas Type VI describes a sinus tract connected to the dura mater by a fibrous cord (5). In addition to this depth-based classification, DSs are further categorized according to anatomical localization as subtype “a” (dorsal midline), subtype “b” (head region excluding the nasal area), and subtype “c” (nasal region) (2,10). Moreover, cases of DS in dogs have been documented in the nasal region (16), cervical region (9), thoracic region (8), lumbosacral region (14), and sacrococcygeal region (10). However, reports describing DS localized specifically to the cranial region remain relatively limited (2,3). A small number of case reports have documented DS occurring in the parieto-occipital region and nasal area (2,5).

To the best of the authors’ knowledge, this represents the first reported case of DS in a Pomeranian dog. This case report describes multiple Type Vb DS lesions localized to the parieto-occipital region of a male Pomeranian dog and details the clinical findings, histopathological diagnosis, surgical management, and long-term outcome. Based on previously proposed classifications (2,10), the findings in this case are consistent with Type Vb DS.

Case History

A 4-month-old male Pomeranian dog was referred to the Veterinary Medical Faculty Animal Hospital at Dicle University with a 40-day history of persistent swelling in the parieto-occipital region, accompanied by alopecia, pruritus, erythema, and intermittent bleeding. The anamnesis revealed prior treatments at multiple veterinary clinics, including parenteral antimicrobial therapy, topical antimicrobial therapy, and topical anti-edematous preparations; however, no clinical regression was observed.

Following clipping and aseptic preparation, physical examination revealed multiple irregularly shaped, firm, scattered masses measuring approximately 0.5–3.5 cm in diameter (Figure 1). The lesions were poorly demarcated, and their exact nature could not be determined clinically. Although small superficial openings were noted on some swellings, no active drainage was detected. Gentle exploration did not reveal a patent sinus tract. Neither clinical examination nor intraoperative assessment revealed any communication between the lesion and the epidermal surface via a true sinus tract.The body condition score was 6/9 (4). Hematological and serum biochemical parameters were within reference ranges.

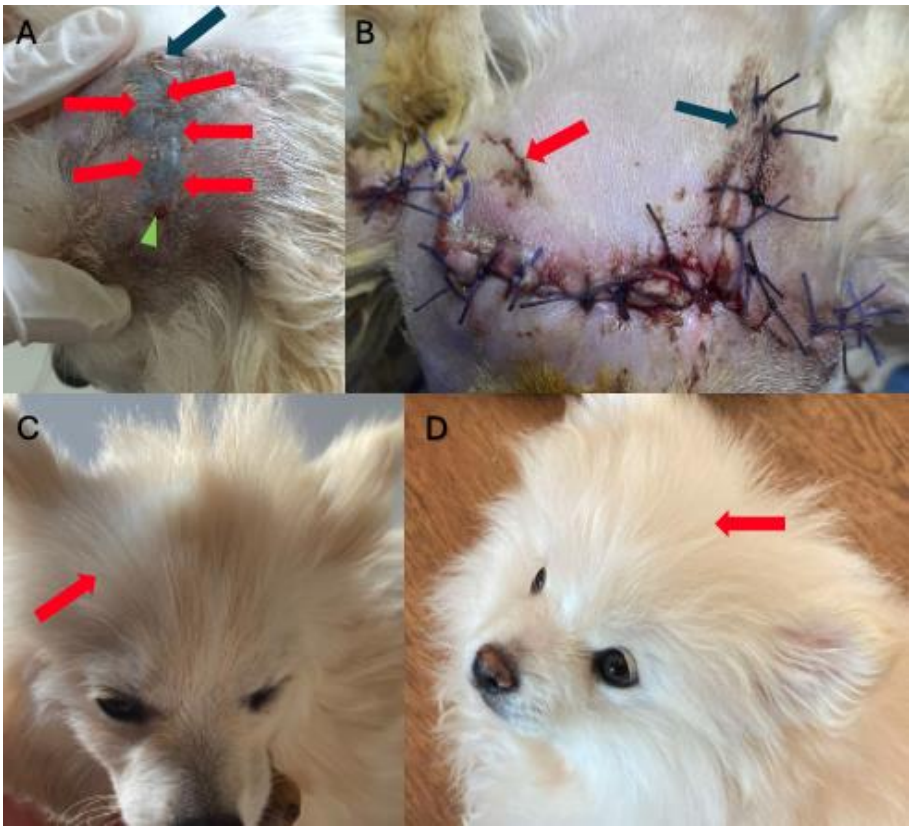


Figure 1. Clinical presentation and postoperative follow-up of DS localized in the parieto-occipital region.

A. Preoperative view demonstrating multiple nodular swellings in the parieto-occipital region (red arrows). A superficial opening is observed (green arrow). Partial evacuation of keratinous material and hair is visible on the right side (blue arrow). B. Immediate postoperative appearance following en bloc excision and reconstruction using a random-pattern advancement skin flap. C. Postoperative follow-up demonstrating complete wound healing and hair regrowth. Mild dorsal nasal skin tension is noted. D. Long-term follow-up showing reduction of skin tension and satisfactory cosmetic outcome.

After obtaining written informed consent, surgical excision was performed. Premedication consisted of medetomidine (30 µg/kg IV). Anesthesia was induced with ketamine (4 mg/kg IV), and maintained with sevoflurane in oxygen. After aseptic preparation, elliptical incisions were made over the masses. Intraoperative evaluation revealed no extension toward the skull. Because individual excision was considered technically challenging and time-consuming, the overlying affected skin was excised en bloc (Figure 2).

Due to the resulting wide skin defect, primary closure was not feasible. Reconstruction was performed using a random-pattern advancement skin flap. The surgical design and execution of the advancement flap are schematically illustrated in Figure 3. Wide subcutaneous undermining was performed, preserving the subdermal vascular plexus, and the skin was advanced cranially for tension-free closure. The flap dimensions were planned to exceed the defect size by approximately 20–30% to allow adequate mobilization and tension-free closure. Layered closure was performed. The subcutaneous tissues were apposed with a simple continuous suture pattern using absorbable suture material, and the skin was closed with simple interrupted sutures.

Results

The excised tissue was fixed in 10% neutral buffered formalin, embedded in paraffin, sectioned at 5 µm, and stained with hematoxylin and eosin. Macroscopically, multiple well-circumscribed epithelial-lined structures containing yellow-white keratinous material and hair fragments were observed (Figure 2). Histopathological examination revealed stratified squamous epithelium lining the lesion, with adnexal structures including hair follicles and sebaceous glands within a fibrous stroma. Keratin lamellae and hair fragments were present in the lumen (Figure 4A). Multinucleated giant cells and mononuclear inflammatory infiltrates were observed in some areas (Figure 4B–C). Collagen deposition and fibroblast proliferation were evident in the surrounding connective tissue (Figure 4D–E). Based on these findings, the lesion was diagnosed as Type Vb dermoid sinus.

Intraoperatively, multiple closely distributed epithelial-lined structures were identified within the subcutaneous tissue of the parieto-occipital region. The lesions were firmly attached to surrounding connective tissues but showed no evidence of invasion into the underlying calvarial bone or periosteum. The absence of cranial penetration was confirmed by careful blunt and sharp dissection. Following en bloc excision, a wide full-thickness skin defect was created that required reconstructive closure.

Postoperative recovery was uneventful, with no evidence of flap necrosis, wound dehiscence, infection, or vascular compromise. During the 12-month follow-up period, no recurrence or wound-healing abnormalities were detected, and satisfactory hair regrowth was achieved. Although a mild cosmetic alteration due to increased regional skin tension was observed, it was not associated with any functional deficit.

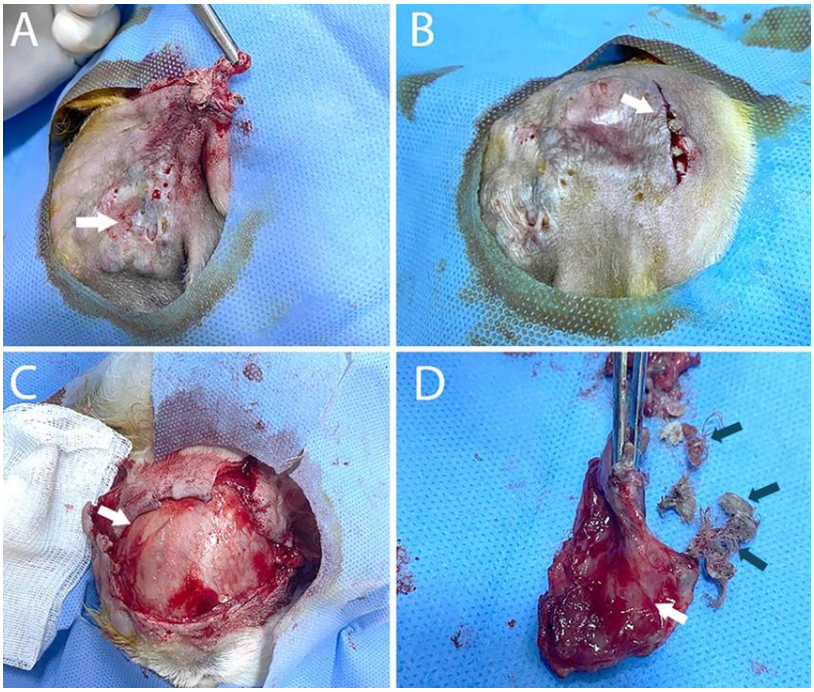


Figure 2. Intraoperative findings and surgical excision of DS in the parieto-occipital region.

A. Intraoperative view demonstrating multiple lesions within the parieto-occipital region (white arrow). B. Surgical removal initiated from the healthy skin surface over the lesion (white arrow). C. Complete en bloc excision of the lesion following careful dissection from surrounding tissues (white arrow). D. Excised specimen containing keratinous material and hair fragments (blue arrows).

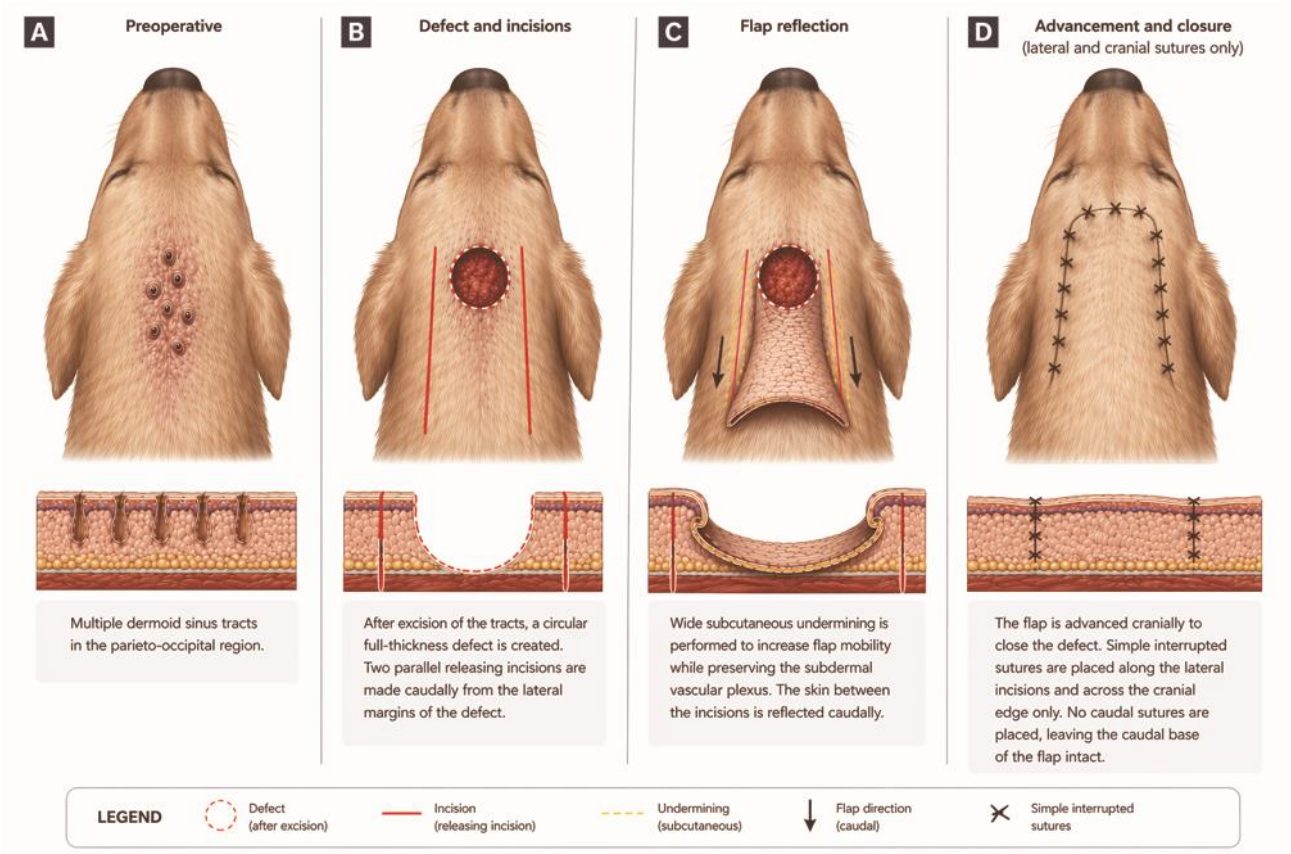


Figure 3. Schematic illustration of a random-pattern advancement flap used for closure of a circular full-thickness skin defect following excision of dermoid sinus tracts.

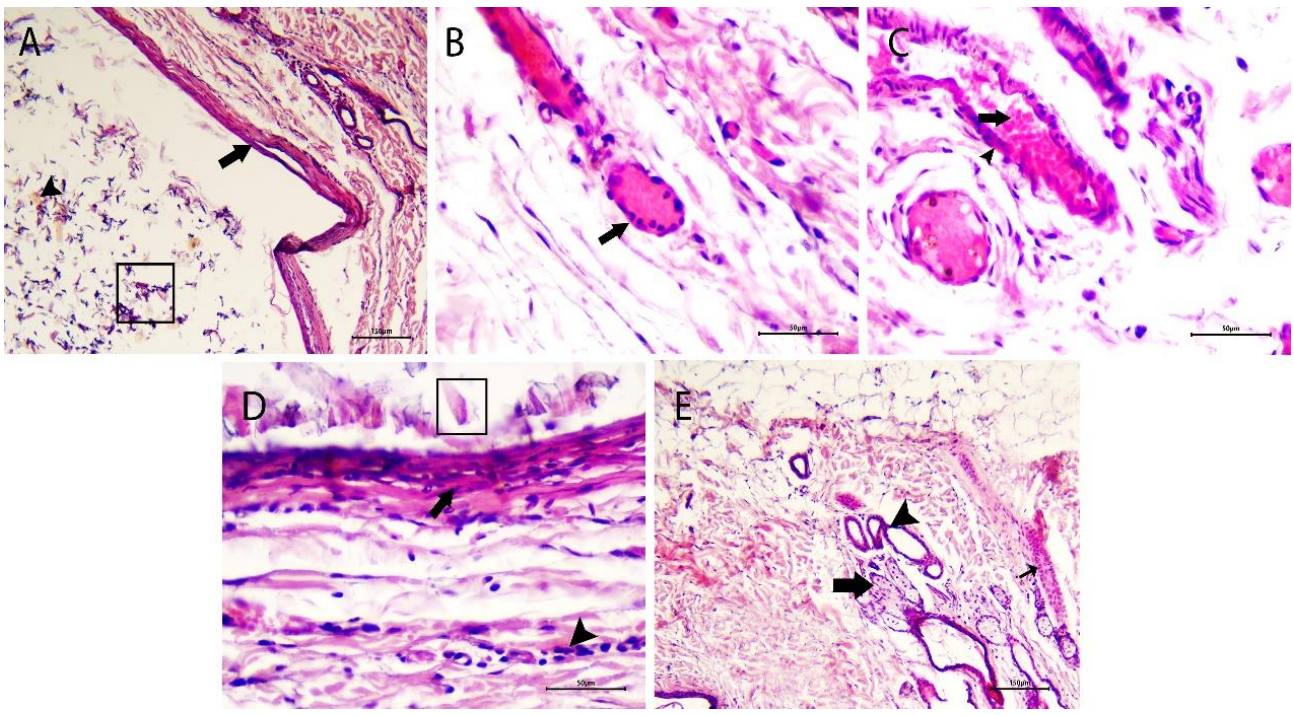


Figure 4. Histopathological features of DS (H&E).

A. Stratified squamous epithelial lining of the lesion (thick arrow) with accumulation of keratin lamellae (square) and hair fragments within the lumen (arrowhead) (4×). B. Multinucleated giant cell associated with granulomatous inflammation (thick arrow) (40×). C. Mononuclear inflammatory cell infiltration (arrowhead) and a blood vessel filled with erythrocytes (thick arrow) (40×). D. Collagen deposition and fibroblast proliferation within the connective tissue wall (thick arrow), scattered inflammatory cells (arrowhead), and intraluminal keratin lamellae (square) (40×). E. Keratinized stratified squamous epithelium resembling epidermis (thin arrow), oval-shaped hair follicles (arrowhead), and lobular sebaceous glands (thick arrow) (10×).

Discussion and Conclusion

DS is classified in veterinary medicine according to the depth of penetration and anatomical localization (2,5,10). In the present case, both clinical and histopathological findings were consistent with Type Vb DS. The lesion, which consisted of a closed epithelial-lined structure without communication with the epidermal surface was difficult to delineate on palpation. These characteristics are in agreement with previously described features of Type V lesions (2,8). Although DS most commonly occurs along the dorsal midline, atypical localizations have been reported in various breeds and anatomical regions. Parieto-occipital, cervical, thoracic, and other rare localizations have been described in the literature (1). These findings indicate that DS should be considered in the differential diagnosis of atypical lesions of the head region. To the best of the authors' knowledge, this case represents the first reported Type Vb DS in a Pomeranian dog for which long-term follow-up data are available. Therefore, the 12-month follow-up period may provide valuable information regarding surgical outcome and long-term prognosis in this breed.

Several reports describing head-localized dermoid sinuses allow comparative evaluation of clinical presentations and surgical management. Bornard et al. (2) reported bilateral parieto-occipital dermoid sinuses in a Rottweiler, in which the lesions were symmetrically distributed and surgically excised without the need for extensive reconstructive procedures. Similarly, Buijtels et al. (3) described multiple dermoid sinuses localized to the head of a Miniature Schnauzer; however, those lesions were relatively confined and did not require wide en bloc skin resection. In Saint Bernard dogs, Type Vb dermoid sinus cases have been documented as epithelial-lined structures lacking epidermal communication (13). Nevertheless, these reports generally described solitary or limited lesions that permitted primary closure following excision. In contrast to the aforementioned cases, the present Pomeranian dog exhibited multiple closely distributed Type Vb dermoid sinus lesions involving a broad parieto-occipital region. The multiplicity and confluence of the lesions necessitated removal of a substantial area of affected skin rather than individual excision of each structure. Consequently, primary closure was not feasible, and reconstructive surgical planning using a random-pattern advancement skin flap was required. Therefore, beyond its rarity in terms of breed and anatomical localization, the distinguishing aspects of this case lie in the multiplicity of lesions and the consequent need for advanced reconstructive management.

Complete surgical excision is regarded as the treatment of choice for DS in veterinary medicine and is generally associated with a favorable prognosis (5). In the present case, complete removal of the lesion was achieved successfully. However, due to the multiple and extensive distribution of the lesions, a wide area of skin had to be excised, making primary closure impossible. Reconstruction was therefore performed using a random-pattern advancement skin flap. Flap techniques are recommended for the management of extensive skin defects in the head region because they reduce tissue tension, preserve vascular supply through the subdermal plexus, and improve both functional and cosmetic outcomes (12). In this case, the selected technique enabled tension-free closure of the defect and resulted in satisfactory healing with hair regrowth and no major postoperative complications. Although mild aesthetic alteration due to increased skin tension was observed during follow-up, no functional impairment was detected. At the 12-month evaluation, this cosmetic difference was considered minimal and clinically insignificant.

A limitation of this report is the absence of advanced preoperative imaging, such as computed tomography (CT) or magnetic resonance imaging (MRI). Advanced imaging modalities such as computed tomography (CT) or magnetic resonance imaging (MRI) could have provided additional information regarding lesion depth, potential intracranial extension, and surgical planning. Such imaging might have further reduced intraoperative uncertainty and improved preoperative risk assessment. Although no cranial extension was observed intraoperatively, cross-sectional imaging could have provided more detailed information regarding lesion depth and potential intracranial involvement. Another limitation is the lack of genetic testing. As exclusion of affected dogs from breeding programs has been recommended (11), neutering was performed in this case to prevent potential hereditary transmission.

In conclusion, surgical excision of Type Vb DS is generally technically feasible and associated with a favorable prognosis when complete removal is achieved. However, in cases involving multiple and extensive lesions, careful preoperative assessment and reconstructive planning, including the use of advancement flap techniques, are essential to achieve tension-free closure and satisfactory cosmetic results. This case highlights the importance of considering Type Vb DS in the differential diagnosis of atypical cranial swellings and emphasizes that appropriate reconstructive strategies play a critical role in optimizing long-term functional and aesthetic outcomes.

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Ethical Statement

This study was approved by the Animal Experiments Local Ethics Committee of the Dicle University Health Sciences Application and Research Center (Approval No. 25/09/2025-08-10).

Conflict of Interest

The authors declared that there is no conflict of interest.

Author Contributions

NS and SY conceived the study and performed the surgical procedures. BT and EE conducted the histopathological examinations. BÖ, BEK, and EÇ contributed to the clinical management of the case and data collection. NS and SY drafted and critically revised the manuscript. All authors reviewed and approved the final version of the manuscript.

Data Availability Statement

The data supporting this study's findings are available from the corresponding author upon reasonable request.

Declaration of Generative Artificial Intelligence (AI)

The authors declare that generative artificial intelligence (AI) and AI-assisted technologies were not used in the writing of this manuscript or in the preparation of figures.

Animal Welfare

The authors confirm that they have adhered to ARRIVE Guidelines to protect animals used for scientific purposes.

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