

**PATHOMORPHOLOGY OF UNILATERAL CANINE
CORNEOCONJUNCTIVAL DERMOID – CASE REPORT**
MORFOPATOLOGIA DERMOIDULUI CORNEOCONJUNCTIVAL
CANIN UNILATERAL – PREZENTARE DE CAZ

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ABSTRACT | REZUMAT

The aim of the study was to describe the pathomorphological features of dogs diagnosed with Corneal-Conjunctival Dermoid at the Veterinary Teaching Hospital of the University of Jos. A 6-month-old female Russian Shepherd dog presented with an initial complaint of hyperaemia of the eye, excessive lacrimation, and an abnormal ocular hairy appearance. The animal was clinically examined and subjected to surgery to remove the tumour. After that, the excised tissue was processed to perform a histopathological and immunohistochemical examination. Grossly, there were abundant mucopurulent ocular discharges with conjunctivitis, epiphora, and the presence of hairy skin tissue in the lateral conjunctival fornix. Microscopically, a thickened stratified squamous epithelium, numerous sebaceous glands, hair follicles, sweat glands, inflammatory cells, and a hydropic degeneration of the stratified squamous epithelium have been observed. Pan-cytokeratin immunolabelled the stratified squamous epithelial layer and the substantia propria of the cornea. Ocular choristoma, or dermoid, is easy to diagnose macroscopically, and an adequate surgical procedure can lead to a definitive resolution. However, it is a tumour less common in dogs, so any additional information related to the macroscopic aspect, associated clinical signs, and surgery stages can help the veterinarian in their daily practice in the clinic.

Key words: choristoma, dermoid, dog, tumour

Scopul studiului a fost de a descrie caracteristicile morfopatologice ale câinilor diagnosticați cu dermoid corneo-conjunctival la Spitalul Veterinar de Predare al Universității din Jos. O femelă de Ciobănesc de Rusia în vârstă de 6 luni a fost evaluată inițial cu hiperemie la nivelul ochiului, lacrimare excesivă și un aspect anormal de păr ocular. Animalul a fost examinat clinic și supus unei intervenții chirurgicale pentru îndepărtarea tumorii. Ulterior, țesutul excizat a fost prelucrat pentru efectuarea unui examen histopatologic și imunohistochimic. Animalul prezenta secreții oculare mucopurulente abundente, conjunctivită, epiforă și un țesut cutanat păros în fornixul conjunctival lateral. Microscopic, s-a observat un epiteliu scuamos stratificat îngroșat, numeroase glande sebacee, foliculi de păr, glande sudoripare, celule inflamatorii și o degenerare hidropică a epiteliului scuamos stratificat. Pan-citokeratina a imunomarcant straturi din epiteliul scuamos și o parte din substanța proprie a corneei. Coristomul ocular sau dermoidul este ușor de diagnosticat macroscopic și o procedură chirurgicală adecvată poate duce la o rezoluție definitivă. Este însă o tumoare mai puțin întâlnită la câini, așadar orice informații suplimentare legate de aspectul macroscopic, semnele clinice asociate și etapele intervenției chirurgicale pot ajuta medicul veterinar în practica zilnică din clinică.

Cuvine cheie: coristom, dermoid, câine, tumoare

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Dermoids are choristomas, which are benign, congenital tumours composed of normal tissue overgrowth, formed during embryonic development in an ectopic location, especially in the ocular surface (2, 9, 14). It represents a form of heterotopia in normal tissue that develops in an aberrant location. Locations at the level of the orbit, cornea, conjunctiva, uvea, retina, optic nerve, and other body parts have been reported (2). Regarding the ocular dermoid, many reports have described lesions in peribulbar regions (14). This has all the attributes of the skin, including the epidermis, dermis, fat tissue, sebaceous glands, hair follicles, blood vessels, and hairs (1, 2). Associated clinical signs include epiphora, conjunctival hyperaemia, ocular pain, blepharospasm, and irrita-

tion (1, 2). Available literature hypothesises that the pathogenesis of choristomas is related to developmental disorders, but the definite pathophysiologic mechanism of the development still remains unknown (1, 2). There have been only a few reports describing choristomas in veterinary medicine, such as: corneal dermoids in dogs (2), cats (5), camelids and river buffalo (16), ovine ocular dermoids (11), equine third eye dermoids (7), corneoconjunctival dermoids, and perineal choristomas in calves (3, 4).

METHODS AND MATERIALS

A 6-month-old female Russian Shepherd dog presented with an initial complaint of hyperaemia, excessive lacrimation, and unilateral development of corneal pigmentation of the left eye. The dog's owners reported an abnormal ocular appearance with complaints of a copious mucopurulent discharge. The topical administration of Terramycin® (Zoetis) had been instituted by the referring veterinarian, with minimal improvements. The tissue sample was collected during surgery by excision through two curvilinear incisions close to the base and parallel to the free end on the bulbar and palpebral surfaces, then immersed in neutral buffered 10% formalin solution for fixation. After fixation, the tissues went through dehydration in graded alcohol (70-100%), clearing in xylene, embedded in paraffin wax, and sectioned at 5 µm using a microtome as described by Rajakumar et al. (2015) (15). Thereafter, staining was carried out on the tissue sections with haematoxylin and eosin. Slides were then examined under the light microscope at appropriate objectives. Photomicrographs of representative neoplastic lesions were taken using a Motic camera, while immunolabelling was performed on dewaxed sections, with the pan-cytokeratin Monoclonal Antibody AE1/AE3 Elabscience (USA) for this sample. Sections (5 µm thick) were cut and mounted on a glass slide and dewaxed in xylene and rehydrated in a graded alcohol. Antigen retrieval was performed by incubating the samples with proteinase K (DAKO, Glostrup, Denmark) for 5 min at 25°C. After that, the samples were washed in phosphate buffered saline (PBS). The next step was to add ethylenediamine tetraacetic acid (EDTA) solution, pH 8.0, a target retrieval solution (TRS), pH 9.0 (Nichirei, Tokyo, Japan), and to microwave the samples for 5 min at 100°C. The slides were cooled to 25°C and washed in PBS. The sections were furthermore treated with 0.3% H₂O₂ in methanol for 30 min at 25°C and were subsequently incubated in 5% goat serum as a blocking solution for 20 min at 25°C. Then, the sections were reacted with primary antibodies for 90 min at 25°C, washed three times in PBS and incubated with secondary anti-mouse Pan Cytokeratin Monoclonal Antibody AE1/AE3

labelled with polymer and horseradish peroxidase (Histofine, Nichirei) for 30 min at 25°C. The sample sections were counterstained with H&E for 20 sec. After washing in flowing tap-water for 5 min, the samples were dehydrated and immersed in xylene. The sections were mounted with malinol (DAKO, Glostrup, Denmark). This IHC procedure was done using standard procedures as described by Duraiyan et al. (2012) (6) and Nakagawa et al. (2017) (13).

RESULTS AND DISCUSSIONS

The general body examination showed a mucopurulent ocular discharge with conjunctivitis and epiphora. Adnexal examination revealed the presence of hairy skin tissue in the lateral conjunctival fornix. These hairs measured approximately 2 cm long and had a matted appearance due to the chronic lacrimal discharges (Fig. 1).



Fig. 1. The eye of the dog showing an aberrant hair-like growth

A thickened stratified squamous epithelium, along with numerous sebaceous glands, hair follicles, and sweat glands, were observed. A hydropic epithelial degeneration was noticed. Inflammatory cells, mainly neutrophils and macrophages, were also present (Fig. 2).

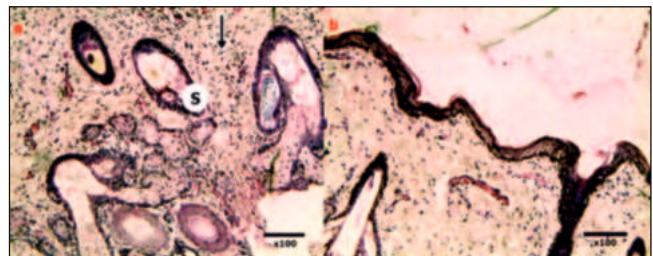


Fig. 2. a: Numerous sebaceous glands (S), hair follicles, inflammatory cells mainly neutrophils and macrophages (thick arrows), H&E; b: Presence of thickened stratified squamous epithelium, H&E

Pan-cytokeratin immunolabeled the stratified squamous epithelial layer and the substantia propria of the cornea, but there was a decreased immunolabeling of the deeper layer cells such as the stroma, Dua's layer, etc (Fig. 3).

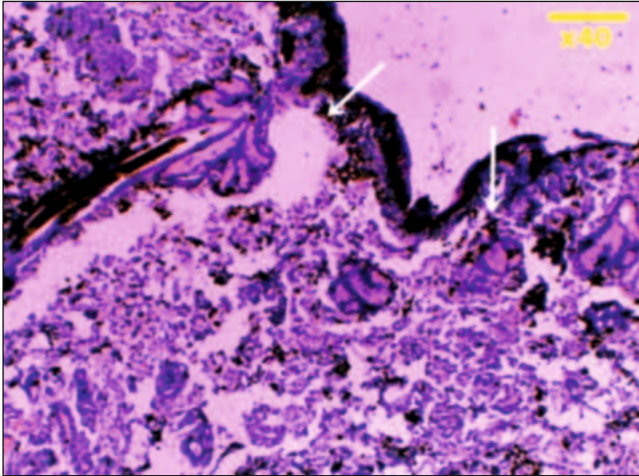


Fig. 3. Immunolabeling by pan-cytokeratin (arrows)

Following the aseptization of the area and surgical team preparation, the anaesthesia was achieved by administering 1% atropine sulphate (0.02 mg/kg) and chlorpromazine (4 mg/kg), IV, as preanaesthetic and 5% ketamine hydrochloride (10 mg/kg, IV) and 2% halothane in oxygen (following intubation) as induction anaesthetics and maintenance anaesthetics, respectively. The patient was positioned on the surgical table on lateral recumbency with the affected eye uppermost, and the choristoma was excised by two curvilinear incisions close to the base and parallel to the free end on the bulbar and palpebral surfaces. The closure of the defect was done in accordance with the Modified Morgan's technique using a size 4-0 vicryl suture (8, 12). After the surgical removal, a post-operative treatment was implemented, and the prognosis was favourable.



Fig. 4. Eye of the dog after healing

A 1% Piroxicam was administered intramuscularly (0.3 mg/kg $x^{1/7}$) plus 2 drops intraocular $x^{1/52}$ BID of Betadron-N® (Betamethasone 0.1% and neomycin 0.5%). To avoid a delay in healing, an Elizabethan collar was applied. Figure 4 shows the dog after the healing of the surgical wound.

The age at which the animal with this condition was discovered agrees with the findings of Balland et al. (2015) (2). The case in this report was unilateral, but it is important to highlight the possibility of bilateral occurrences. This study partly agrees with the findings of María del Mar et al. (2019), where the same IHC antibody was used but a diagnosis of corneal squamous cell carcinoma was made (10).

The surgical excision of this corneal choristoma at an early age with proper post-operative management was curative. Balland et al. (2015) used another surgical technique, in which they made a V-shape incision and the conjunctival defect was sutured with a 6-0 vicryl. The same surgical floss was used during continuous suturing of the palpebral conjunctiva. In the end, the skin was sutured with 5-0 nylon. For general anaesthesia, a combination of medetomidine, ketamine, and morphine hydrochloride was used. Postoperatively, chloramphenicol ointment was applied topically for 2 weeks (2).

CONCLUSIONS

Canine corneoconjunctival dermoid is a rare tumour that affects a small number of dogs. An early surgical treatment, along with additional histopathological and immunohistochemical examinations, can help the vet make a definitive diagnosis. The data stemming from this report may contribute to the current knowledge about this rare but unique tumour.

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