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Case Report

Schwannoma of the External Auditory Canal in a Filly: A Case Report

Nasrollah Ahmadi DVM, PhD [a], Ahmad Oryan DVM, PhD [a], Mohsen Ghane DVM, PhD [b], Bita Geramizadeh MD, PhD [c]

[a] Department of Pathology, School of Veterinary Medicine, Shiraz University, Shiraz, Iran
[b] Department of Clinical Sciences, School of Veterinary Medicine, Shiraz University, Shiraz, Iran
[c] Department of Pathology, Transplant Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

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ABSTRACT

Schwannomas of the external auditory canal (EAC) are exceedingly rare in human beings and domestic animals. Herein we describe the clinicopathological and immunohistochemical features of a benign schwannoma arising in the EAC of a 2.5-year-old filly. Microscopically, the mass showed a spindle cell tumor composed of hypocellular Antoni type B areas as a myxomatous arrangement of mesenchymal cells and hypercellular Antoni type A areas displaying short fascicles of densely packed neoplastic cells in the collagenous stroma. Immunohistochemically, the tumor cells were diffusely positive for S100 protein and vimentin but negative for Ki67. It was concluded that schwannomas should be included in the differential diagnosis of EAC masses, and immunohistochemical markers such as S100 protein can strongly help in differentiating this tumor from other spindle cell tumors.

1. Introduction

Schwannoma (synonym: neurilemmoma, neurinoma or Schwann cell tumor) is a peripheral nerve sheath tumor (PNST) that arises from the neural sheath Schwann cells of the peripheral, cranial, or autonomic nerves in different anatomic locations and can be benign or malignant [1]. The main histological feature of schwannoma is alternating patterns of hypercellular Antoni type A and hypocellular Antoni type B areas with nuclear palisading and Verocay bodies. Immunohistochemically, schwannomas usually shows positive diffuse immunolabeling of S100 protein as a Schwann cell marker [2-5]. In human beings, schwannomas of the head and neck comprise 25%-45% of all schwannomas, whereas those of the middle ear, internal and external auditory meatus, and neck are less frequently involved [6]. Most of these tumors originate from cutaneous or muscular branches of the cervical or brachial plexus [7].

Benign peripheral nerve sheath tumors (BPNSTs) have been reported in domestic animals, and the most frequent are reports in cattle and dogs [8-10]. In domestic animals, the most common sites of PNSTs are the brachial plexus, intercostal nerves, and heart [2,11,12]. Review of the veterinary medical literature failed to find any report of schwannoma in the equine external auditory canal (EAC). To the best of our knowledge, this is the first case of EAC schwannoma reported in domestic animals. However, here we describe the clinicopathological and immunohistochemical features of a benign schwannoma arising in the EAC of a horse.

2. Case Presentation

A 2.5-year-old filly weighing approximately 300 kg was presented with a firm, painless, and well-circumscribed mass totally filling the left EAC (Fig. 1). The neoplastic mass was located in the inferior wall of cartilaginous portion without any hearing loss, bone erosion, or middle ear involvement. There was no evidence of facial weakness, head tilt, or deviation and nystagmus. The horse had no pain or discomfort in the ear, and the auricle was normal.

Corresponding author at: Nasrollah Ahmadi, DVM, PhD, Shiraz University, School of Veterinary Medicine, Department of Pathology, Shiraz 71345-1731, Iran.
E-mail address: nahmadi@shirazu.ac.ir (N. Ahmadi).

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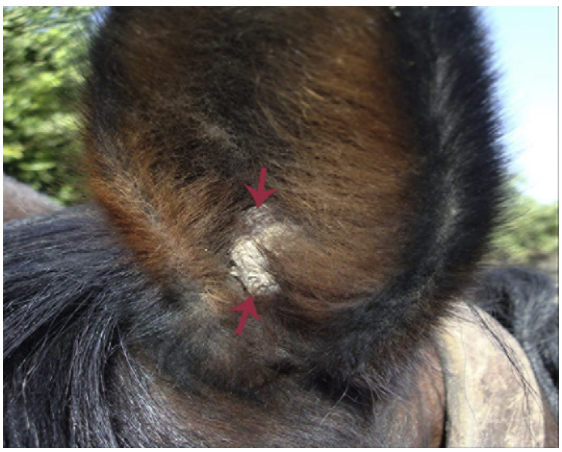

Fig. 1. A neoplastic mass was located in the external auditory canal in the inferior wall of cartilaginous portion of the left ear of a horse and totally filled the ear canal (arrows).

Fig. 2. The tumor, revealing a well-circumscribed, alopecic, nonulcerated, firm, smooth and creamy yellow-colored mass extracted from the ear canal of a horse.

Physical examination revealed no lymphadenopathy in the head and neck region and no further significant clinical abnormalities in other locations of the body. In addition, vital signs such as pulse rate, respiratory rate, and rectal temperature were normal. The horse was restrained in an individual stock with a nose twitch and sedated with intravenous xylazine (2%, Alfasan; Woerden-Holland), 0.2 mg/kg body weight (BW), and acepromazine (Neurotranq 1%, Alfasan; Woerden-Holland), 0.02 mg/kg BW. Surgical resection was carried out under local auropalpebral anesthesia with lidocaine (2%, Pasteur Institute of Iran) in a standing position, and mass debris was cauterized by using a hot forceps. Preoperatively, the horse was given intramuscular penicillin G procaine plus streptomycin (40,000 IU/kg plus 1.1 mg/kg), and flunixin meglumine (Flunex 5%; Razak Laboratories, Tehran, Iran), 1.1 mg/kg BW.

On gross examination, the tumor revealed a well-circumscribed, alopecic, nonulcerated, firm, smooth and creamy yellow-colored mass measuring 5 × 3 cm in diameter (Fig. 2). The excised mass was round to oval, without an apparent vascularity. Cut surfaces of the mass were homogenously solid without any necrosis and hemorrhage (Fig. 3). Sections of different parts of the mass were fixed in 10% neutral buffered formalin (pH 6.8), dehydrated with graded ethanol concentrations, embedded in paraffin wax, sectioned, and stained with hematoxylin and eosin (H&E) and Masson's trichrome for microscopy examination. Immunohistochemically, the 4-μm-thick sections were stained for S100 protein (clone S100; DAKO), vimentin (clone Vim 3B4; DAKO), and Ki67 (clone MIB-1; DAKO). As chromogen, 3,3-diaminobenzidine tetrahydrochloride (DAB) was used. All immunohistochemical sections were counterstained with Harris hematoxylin. For negative controls, the primary antibody was replaced with nonimmune serum. Positive internal control (blood vessels) and external control (cutaneous Langerhans cells) were used for expression of vimentin and S100 protein, respectively.

Microscopically, the mass showed a moderate to severe spindle cell pattern with indistinct cell borders and inconspicuous nucleoli (Fig. 4). The unencapsulated tumor mass was composed of hypocellular Antoni type B areas as a myxomatous arrangement of mesenchymal cells with small elongated hyperchromatic nuclei and a small amount of pale eosinophilic, poorly defined cytoplasm (Fig. 5). The tumor also revealed areas of hypercellular Antoni type A arrangements displaying short fascicles of densely packed neoplastic cells in the collagenous stroma, without nuclear palisading pattern or Verocay bodies. There were no nerve fibers within the tumor tissue. No evidence of necrosis, atypia, or mitosis was present. Masson's trichrome staining revealed small to moderate amounts of intervening collagen fibers forming an irregular, loose stroma. Immunohistochemical study of the tumor cells was positive for vimentin and S100 protein marker (Fig. 6) but negative for Ki67. Based on the histopathological and immunohistochemical features, a benign schwannoma of the EAC was diagnosed. Until now, there has been no recurrence of original tumor during 2 years' follow-up.

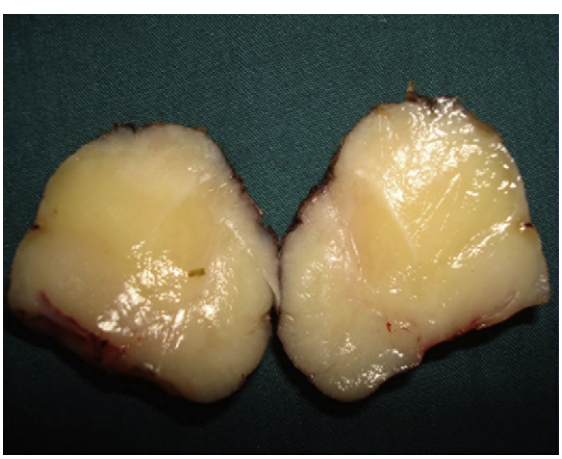

Fig. 3. Cross-section of the tumor of the ear canal of a horse, showing homogenous solid architecture. No necrotic changes or hemorrhages are evident in the section.