Short Communications

Spontaneous branchioblastoma in a koi carp (*Cyprinus carpio*)

W. H. Wildgoose, D. Bucke

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GILL tumours are rare in teleost fish (J. C. Harshbarger, personal communication). The lesion described in this case is a benign organoid tumour-like mass of gill tissue that is either a neoplasm or developmental anomaly (hamartoma). A branchioblastoma is a benign tumour of blast cells thought to originate from mesenchymal blastema which normally produces all the connective tissue components of gills. A hamartoma is a benign overgrowth of mature tissue with a disordered arrangement.

A 40 cm ornamental koi carp (*Cyprinus carpio*) was presented on May 18, 1993, having died several hours earlier. The fish had been ill for a week and had developed symptoms of 'dropsy' with scale oedema and bilateral exophthalmia ('pop-eye'). The fish was in good physical condition but had about 30 immature fish lice (*Argulus* species) with a few localised areas of inflammation on its body. Examination of fresh body mucus and gill filaments by microscopy did not reveal any other ectoparasites. The body wall was oedematous with some elevation of the scales and the abdomen was bulging, although there was little ascitic fluid.

There were firm masses in the dorsal area of the gill spaces on both sides. These measured 8 x 17 mm on the left side and 10 x 20 mm on the right side. In addition, there was a smaller discrete mass (12 mm diameter) in the middle of the first arch of the left gill (Fig 1). All these masses were pale in colour, cauliform and almost lymphoid in appearance.

Histological examination of the gill lesions revealed multiple, branching, organoid masses originating from gill filaments and pseudobranch filaments consisting of islands of poorly formed gill tissues in a fibrous stroma. These tissues included nests of basophilic blast cells, irregular islands of cartilage and structures that resembled gill lamellae. Mitotic figures were present in some basophilic cells. The masses looked benign and there was no evidence that adjacent tissues were being invaded (Fig 2).

Internally, both posterior lobes of the kidney were enlarged with small (1 to 2 mm) white, irregular-shaped lesions which coalesced in some areas. Histological examination revealed the renal tubules and glomeruli to be extensively infiltrated by histiocytes and other inflammatory cells. This severe reactive process is thought to be the cause of death and clinical scale oedema. There was a band of atrophic muscle surrounding the heart, although the cause and significance of this was not apparent.

An epithelio-chondroma on the first gill arch has been reported in an Amazonian cichlid (*Chaetobranchus semifasciatus*) (Thatcher and Varella 1980). Multiple metastases were found on both gills associated with metacercariae of a trematode (*Heterophyidae, Ascocotyle* species). It was suggested that the invasion of parasites in the presence of some genetic anomaly in the host could have caused the branchial tumour. However, no parasites were found in the gills of the koi carp.

FIG 1: Two separate masses on the left gill arch

In the present case, the gill lesions were similar to those found in naturally collected rainbow trout (*Oncorhynchus mykiss*), steelhead rainbow trout (*Salmo gairdneri*), brown trout (*Salmo trutta*) (Montali and others 1983), gilthead (*Crenilabrus melops*) and Atlantic salmon (*Salmo salar*) (J. C. Harshbarger, personal communication). They have been experimentally induced by exposure to the carcinogens N-methyl-N′-nitro-N-nitrosoguanidine (MNNG) in medaka (*Oryzias latipes*) (Kimura and others 1983, Brittelli and others 1985), platyfish cross swordtail F1 hybrids (*Xiphophorus maculatus* cross *helleri*) (Kimura and others 1983), channel catfish (*Ictalurus punctatus*), and again in medaka with benzo [a] pyrene (J. C. Harshbarger, personal communication).

The koi carp had been owned for six months. Its previous history and exposure to chemicals was unknown but clinical examination of five fish from the same pond failed to reveal any visible gill lesions. Due to the difficulty in concluding if the gill lesions are true neoplasms or developmental anomalies, the term 'spontaneous branchioblastoma' is used conservatively. This is believed to be the first report of this neoplasm in koi carp and stained histo-

W. H. Wildgoose, 655 High Road, Leyton, London E10 6RA
D. Bucke, Ministry of Agriculture, Fisheries and Food, Fish Diseases Laboratory, The Nothe, Weymouth, Dorset DT4 8UB

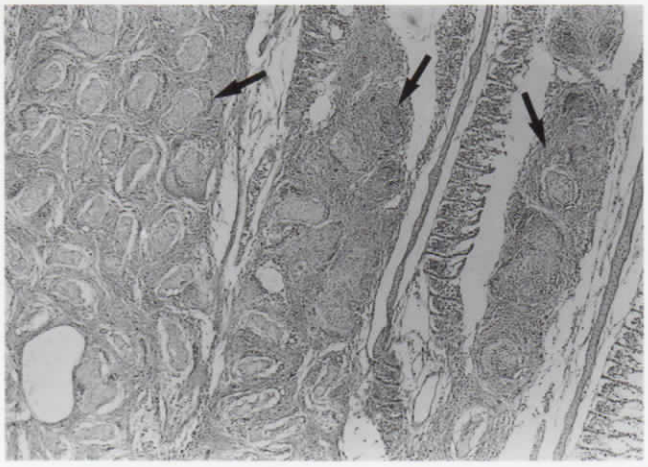

FIG 2: Histological section showing firm masses, including islands of cartilage displacing gill filaments (arrowed). Haematoxylin and eosin x 40

logical sections have been deposited with the Registry of Tumors in Lower Animals, Washington DC (RTLA 5800).

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Spontaneous otoacoustic emission in a pony

I. G. Mayhew, S. E. Preston, D. Hannant,
J. R. Washbourne, C. B. Johnson, T. J. Phillips

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THE perception of a sound emanating from one's ear, referred to as tinnitus, is experienced by most human beings during their lifetime (Goodhill 1954). If this sound is not heard by an examiner it is referred to as subjective tinnitus. When the sound is heard by an examiner it is referred to as objective tinnitus. These terms are probably inappropriate in veterinary medicine where the term otoacoustic emission is preferable (Sims and others 1991).

Otoacoustic emissions can be audible or subaudible to the patient and to an examiner and can be induced spontaneously or following application of an external, sound energy stimulus (Probst and others 1991).

Otoacoustic emissions reflect a reversal in the normal hearing pathways. Cochlear efferent nerve fibres are capable of stimulating outer hair cells to vibrate, potentially resulting in not only a perception of a sound, but also reversed stimulation of endolymph and perilymph and ultimately of the ossicles and tympanic membrane which acts as a sound generator (Probst and others 1991). Subaudible spontaneous and induced otoacoustic emissions can be recorded from normal-hearing human beings and animals (Probst and others 1991, Sims and others 1993). Audible spontaneous otoacoustic emissions (equivalent to objective tinnitus in human beings) have been recorded in a few dogs (Decker and Fritsch 1982, Ruggero and others 1984, Sims and others 1991) and other species (Sims and others 1991, 1993) but do not appear to have been reported in the horse. This communication documents a case of spontaneous audible otoacoustic emission in an equine species.

A five-year-old grey Welsh pony gelding was referred for surgical excision of a disfiguring melanomatous mass affecting the left upper lip and commissure. Surgical excision and commissural reconstruction was performed and the pony started on cimetidine therapy. During postoperative hospitalisation, and before the beginning of cimetidine therapy, it was noticed (by S.E.P.) that while grooming the pony's neck a high pitched noise could be heard that was traceable to the pony's right external ear canal. The sound could be heard by all the authors except one (D.H.) who suffers from premature, partial, high frequency presbycusis related to an ongoing intimate association with electric guitar loudspeakers. The sound appeared constant in its frequency although it did vary in amplitude.

Short latency (10 ms), brainstem auditory evoked potentials were recorded (Mayhew and Washbourne 1992) using broad band clicks and using pure tone pips at 8 kHz all of which were within normal ranges. The sound was recorded on high precision magnetic tape using a Shune Unidyne microphone and a Foster X-15 recorder on single channel gain then played into a Macintosh computer via an analogue to digital converter (Mac Adios; G. W. Instruments) and examined for frequency. The mean frequency was determined to be 7 kHz. The pony appeared totally oblivious to this sound and was discharged to convalesce from the surgery.

The clinical importance of otoacoustic emissions in horses is likely to be insignificant although speculative musings on their relationship with headshaking are intriguing.

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I. G. Mayhew, S. E. Preston, J. R. Washbourne, C. B. Johnson, T. J. Phillips, Department of Clinical Studies, **D. Hannant,** Department of Infectious Diseases, Animal Health Trust, PO Box 5, Newmarket, Suffolk CB8 7DW

Small animal fluid therapy: practice principles

THIS review defines the pathophysiological principles which underlie the use of fluid therapy for the treatment of hypovolaemia, acid-base disturbances, hyper- and hypokalaemia, cell deficitis of potassium, and hyper- and hyponatraemia in small animals, and deals with a number of misconceptions. These include the belief that colloids are better than crystalloids for treating shock, and that glucose-saline is a safe physiological solution for restoring circulating volume and providing essential calories. It also considers the problems posed by the EC requirement that products for human use should not be used in an animal if there is another product licensed for that species, even if the product is less effective than the human product.

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