

Leiomyoma Localized on the Head of a Goldfish (*Carassius auratus*)

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Abstract: A tumor structure, 2 x 2.5 x 0.7 cm in size, was observed on the top of a goldfish's (*Carassius auratus*) head. On histopathological examination of the tumor tissue, palisadic fusiform smooth muscle cells constituting a focal whirling pattern were seen. No mitosis was observed in the cells. In conclusion, the conventional staining results suggested that the tumor was leiomyoma.

Key Words: Goldfish, *Carassius auratus*, tumor, leiomyoma

Japon Balığının (*Carassius auratus*) Kafasına Lokalize Olmuş Leiomyoma Tümörü

Özet: Japon balığının (*Carassius auratus*) kafasının üst kısmında 2 x 2,5 x 0,7 cm ebatlarında bir tümör oluşumu gözlemlendi. Tümör dokuları üzerinde yapılan histopatolojik incelemede; girdap yapıları oluşturan palizatik dizilimli iğ şekilli düz kas hücreleri görüldü. Hücrelerde mitoz rastlanmadı. Konvensiyonel boyama sonuçlarından tümörün leiomyoma olduğu anlaşıldı.

Anahtar Sözcükler: Japon balığı, *Carassius auratus*, tümör, leiomyoma

Introduction

Mesenchymal tumors are considered an important group of neoplasia. They originate from various cell groups and are called by various names according to the tissue structure: lipoma, liposarcoma, fibroma, fibrosarcoma, leiomyoma and leiomyosarcoma (1). Some of these tumors have been reported in fish such as *Squalus fernandinus*, *Raja macrorhynchus*, *Sardina pilchardus*, *Salmo gairdneri* and *Carassius auratus* (2).

Smooth muscle tumors of soft tissue are classified under 2 groups, leiomyoma and leiomyosarcoma. Smooth muscle cells are widely distributed throughout the body and contribute to the gastrointestinal and genitourinary system. They constitute a significant portion of blood vessel walls and make up the pilar arrector muscles of the skin (3).

Although several infectious agents have been identified as associated with tumors, including parasites (4), toxicants (5), oncogenic viruses, genetic predisposition, ultraviolet radiation, and other as yet undefined synergistic environmental factors (6), the etiologic agent has not been isolated or characterized.

It is noteworthy that this type of tumor, which is very rarely seen and thought to extend from the basal cells of the epidermis, may be located on the top of a fish's head. Therefore, this case was considered important. Thus, in the present paper, the macroscopical and histopathological findings of a smooth muscle tumor in a goldfish are described.

Case History

The fish in the study was 3 years old and 15 cm in fork length. The fish was euthanized with an overdose of anesthetic (MS-222™). Then all tissue samples were collected and fixed with formalin saline. Tissue samples were dehydrated with a fully automated tissue processor (Autoteknikon®-Citadel 2000). After paraffin embedding and sectioning, the samples were stained with hematoxylin and eosin (H&E), Van Gieson, Masson's trichrome and reticulin (7). Following the staining process, the samples were examined and photographed under an Olympus® BH-50 light microscope.

Results and Discussion

From the macroscopic examinations, it was determined that the slow growing tumor attained dimensions of 2 x 2.5 x 0.7 cm (after approximately 12 months) on the top of a goldfish's (*Carassius auratus*) head. (Figure 1A). In addition, the morphological structure of the tumor had a regular edge and was lobular, and its section surface had a plexus construction and was gray-white.

In the histological examinations, the section stained with H&E showed that tumor tissue had a sharply circumscribed border and no capsulated structure (Figure 1B). In tumor tissue, while it was observed that interlacing bundles of fusiform cells constituted a focal whirling pattern with elongated vesicular nuclei, there was no mitosis (Figure 1C).

In the study carried out to determine the reticular structure of the tumor sections a thin reticular network (Figure 1D) was found. Furthermore, it was determined that the tumor sections stained with Van Gieson were yellow and those stained with Masson's trichrome were red. Fusiform cells were also observed on the tumor sections stained with Masson's trichrome.

In previous studies, researchers reported several tumor structures including leiomyoma in rainbow trout

(2), such as epidermal papilloma and lymphosarcoma in wild and cultured Atlantic salmon, fibrosarcoma and hepatoma in rainbow trout, and condrosarcoma in paddlefish (8). Some researchers reported that leiomyomas have been found in many organs of fish such as the stomach, mouth, skin, head, fins and testicles (2,9). Roberts (10) stated that leiomyoma has a high prevalence and occurs in epizootic proportions on the testicles of yellow perch (8% of those examined) from the Great Lakes in Canada.

Leiomyoma is histologically similar to fibroma and schwannoma, which are types of mesenchymal tumors. In differential diagnosis, they have to be taken into consideration. Fibromas are stained red with Van Gieson stain; reticular structures are evident and may extend irregularly into neighboring tissue (1). Neurilemmomas are stained red-purple with Masson's trichrome stain (7), they have a fence-like fiber pattern and they produce Antoni A and Antoni B structures (11).

In our study, we found a tumor on the top of a goldfish's (*Carassius auratus*) head; a similar case was previously reported by Plehn as cited by Mawdesley-Thomas (2).

No prominent capsule was observed in the sections stained with H&E. Interlacing bundles of fusiform cells

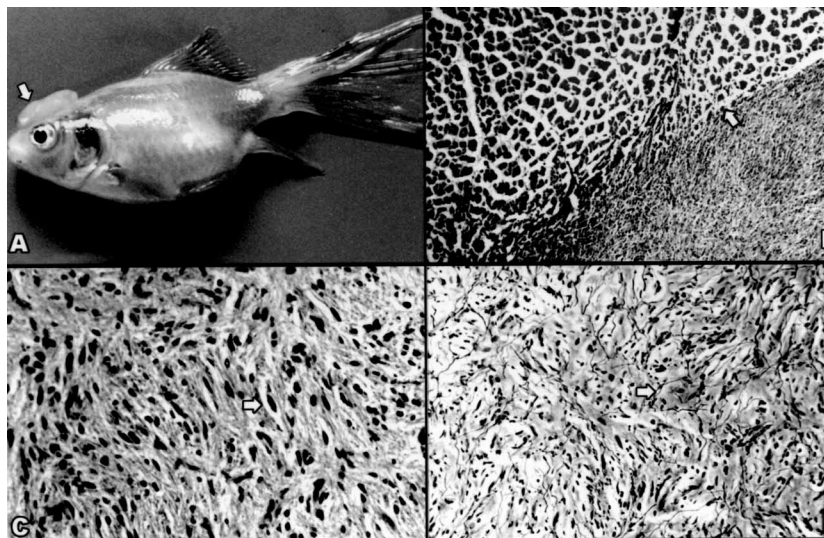


Figure 1. A: A tumor on the top of a goldfish's (*Carassius auratus*) head. B: Tumor tissue had a sharply circumscribed border, no capsulated structure (right lower corner) and normal tissue (left upper corner) (H&E x 40). C: Fusiform cells that constituted the focal whirling pattern had elongated vesicular nuclei (H&E x 200). D: Thin reticular network structure of the tumor (Reticulin x 100).

with elongated vesicular nuclei and eosinophilic cytoplasm were seen. In addition, a thin reticular web was determined with reticulin stain, and the tumor stained yellow with Van Gieson stain and red with Masson's trichrome. The results revealed that the tumor was leiomyoma. In addition, no giant cells or mitotic nuclei

were encountered in the histological examinations. These findings, indicated that the tumor could be benign leiomyoma (11). The data about slow growing ability of the tumor and no metastasis in the examined tissue sections confirmed our hypothesis (1).

References

1. Robbins, S.L., Kumar, V.: Basic Pathology. Saunders, Philadelphia. 1987; 290-299.
2. Mawdesley-Thomas, L.E.: Neoplasia in Fish. In: Ribelin, W.E., Migaki, G., Eds. The Pathology of Fishes, The University of Wisconsin Press, USA. 1975; 805-870.
3. Enzinger, F.M., Weiss, S.W.: Soft Tissue Tumors. Second Edition. The C.V. Mosby Company, St. Louis. 1988; 402-432.
4. Dailey, M. D., Morris, R.: Relationship of parasites (Trematoda: Spirorchidae) and their eggs to the occurrence of fibropapillomas in the green turtle (*Chelonia mydas*). Can. J. Fish. Aquat. Sci., 1995; 52: 84-89.
5. Aguirre, A.A., Balazs, G.H., Zimmerman, B., Galey, F.D.: Organic contaminants and trace metals in the tissue of green turtles (*Chelonia mydas*) afflicted with fibropapillomas in the Hawaiian Islands. Mar. Pollut. Bull., 1994; 28: 109-114.
6. Herbst, L.H.: Fibropapillomatosis in marine turtles. Ann. Rev. Fish Dis., 1994; 4: 389-425.
7. Bancroft, J.D., Cook, H.C.: Manual of Histological Techniques. Churchill Livingstone, New York. 1984; 39-52.
8. Bruno, D.W., Poppe, T.T.: A Colour Atlas of Salmonid Diseases. Academic Press, London, San Diego, New York, Boston, Sydney, Tokyo, Toronto, 1996; 105-110.
9. Budd, J., Schroder, J.D., Dukes, K.D.: Tumors of the yellow perch. In: Ribelin, W.E., Migaki, G., Eds. The Pathology of Fishes, The University of Wisconsin Press, USA, 1975; 895-906.
10. Roberts, R.J.: Fish Pathology. Bailliere Tindall, London, Toronto, 1989; 167.
11. Anderson, W.A.D., Scotti, T.M.: Synopsis of Pathology. Aykan, T.B., Tüzüner, N., Sav, A., İnce, Ü., Translators. Nobel Tıp Kitabevi, İstanbul: 1987; 312-877.