NOTE

Multicentric lipoma in a molly (*Poecilia velifera*)

C. De Stefano, R. Bonfiglio, G. Montalbano,
P. Giorgianni and G. Lanteri*

*Dept. of Veterinary Sciences, University of Messina,
Polo Universitario dell’Annunziata, 98168 Messina, Italy*

**Abstract**

A neoplasia diagnosed as multicentric lipoma affecting a single aquarium fish (molly *Poecilia velifera*) is described. The fish had six exophytic dermal masses on its lateral side of the back deforming the skin surface. Histologically, the neoplasia consisted of well differentiated adipocytes. This is the first report of lipoma in molly.

Lipoma in fish is considered a rare neoplasia. Nevertheless, adipose neoplasms (lipomas, liposarcomas and fibrolipomas) have been described in bream (*Abramis brama*) (Mawdesley-Thomas & Bucke, 1968), rockfish (*Sebastodes diploproa*) (Harshbarger, 1969), largemouth bass (*Micropterus salmoides*) (Mawdesley-Thomas, 1972), black crappie (*Pomoxis nigromaculatus*) (Harshbarger, 1972), sand flathead (*Platyccephalus bassensis*) (Hard et al., 1979), catfish (*Ictalurus punctatus*) (McCoy et al., 1985), mullet (*Mugil cephalus*) (Easa et al., 1989), farmed striped seabream (*Lithognathus mormyrus*) (Volpatti et al., 1998), farmed halibut (*Hippoglossus hippoglossus*) (Bambir et al., 2000), Thunnus spp. (Munday et al., 2003), farmed northern bluefin tuna (*Thunnus thynnus*) (Marino et al., 2006), farmed southern bluefin tuna (*Thunnus maccoyii*) (Lester and Kelly, 1983; Johnston et al., 2008), and Mediterranean seabass (*Dicentrarchus labrax*) (Marino et al., 2011).

The molly (*Poecilia velifera*) is one of the most common aquarium fish, widely present in private and public aquaria. Although infectious and parasitic diseases have been studied in this fish (Aguirre-Macedo et al., 2001), no reports concerning neoplasias are available in literature. The aim of the present paper is to describe a lipoma in a molly.

An adult molly (*P. velifera*) (Regan, 1914) of approximately 6 cm in length 10 g in weight, originating from a private aquarium (Messina, Italy) was sent for the examination of recent masses which had appeared during the previous five months on the lateral sides of the fish. The subject had been reared by the owner in a 100 l aquarium (100 x 20 x 40 cm), alongside a 30 fish belonging to different species, fed with commercial food.

Normal and pathological muscular tissues from the area of the lesions were sampled, fixed in
Histologically, the neoplasms arose from dermal tissue and showed well defined borders and no tendency to invade surrounding tissues (Figure 2). The neoplastic tissue was characterized by well differentiated mature adipose cells containing single large fat vacuoles and flat nuclei pushed to the periphery of the cells (Figure 3). The fat cells were uniform and were supported by a thin stroma which condensed to form thin septa giving a slightly lobulated feature to the neoplasm. No evidence of mitoses, necrosis, steatonecrosis were detected. A few scattered blood vessels and sometimes small areas of haemorrhage were seen.

Macroscopic and microscopic features were consistent with a diagnosis of a multicentric lipoma. Histologically, the neoplasm was mainly constituted of well differentiated adipocytes, without evidence of mitosis and without tendency to infiltrate the surrounding tissues. Blood vessels were present although not involved in neoplastic transformation permitting a differential diagnosis of angiolipoma (Galofaro et al., 2005).

10% buffered formalin solution and embedded in paraffin wax. Sections were stained with haematoxylin and eosin (H&E), Periodic acid-Schiff (PAS), Masson’s trichrome and Van Gieson.

At external examination, the specimen showed six prominent growths deforming the body. On the left side two large masses were present protruding towards the surface (Figure 1). Two further neoplasias were located on the right side; one on the dorsal fin and one close to the mouth. The overlying epidermis was normal. The masses were irregularly spherical, firm, and slightly elastic in consistence. The largest mass had a diameter of about 4 mm, whilst the smaller one was 0.5 mm in size. At the cut surface, the tissue was light-grey in colour with some light pink areas, referable to muscle tissue, and showed a lardaceous texture. The masses had a thin capsule, margins were distinct, and never infiltrating the underlying muscles. The remaining body organs and tissues were normal at macroscopic examination.

**Figure 1. Poecilia velifera.** Macroscopical appearance of the neoplasms (arrow) deforming the body dorso-laterally.
Figure 2. *Poecilia velifera*. Histological low power view of the neoplasia showing well distinct borders, a thin capsule delimiting the tumour tissue, and no tendency to involve the surrounding tissues. Bar = 200μm.

Figure 3. *Poecilia velifera*. Histological section showing the neoplasia tissue constituted of well differentiate adipocytes (arrow). (H&E) Bar = 50μm.
According to the World Health Organization International Histological Classification of Neoplasias of Domestic Animals (Hendrick et al., 1998), neoplasias arising from adipose tissue are classified as either benign (lipoma and angiolipoma) or malignant (liposarcoma). Lipoma is a benign neoplasia of well-differentiated adipocytes that is found in most domestic animals (Goldschmidt and Hendrick, 2002) and humans. Histologically, a lipoma is often indistinguishable from normal adipose tissue. Lipomas are localized nodules of otherwise normal appearing fat and only their lumpy appearance has justified the inclusion among neoplasms (Yager and Scott, 1985). This mesenchymal neoplasm has been reported in both freshwater and marine fish.

Due to the rarity of neoplasias of fat tissue in fish and the scarce availability of data in the scientific literature, only hypotheses can be made regarding their aetiology. The aetiology of lipoma development is unknown. An error in fat metabolism (Easa et al., 1989; Pulley and Stannard, 1990), endocrine or neurological dysfunctions (Easa et al., 1989), as well as a dysraphic status of bone tissue as a predisposing factor leading to a congenital neoplasm (Marino et al., 2006b) have been proposed as possible causes. Furthermore, studies suggesting that lipoma development may be due to excessive differentiation of interstitial mesenchymal cells into adipocytes, a form of hyperplasia (Pulley and Stannard, 1990) is also a possibility.

However, it is reasonable to assume that in such neoplasm, including the case here described, a dysmetabolic disturbance may be present. In aquarium fish, as well as in farmed species, aspects regarding the quali-quantitative profiles of the lipid component of the muscular tissue are complex and sometimes enigmatic. According to studies (Marino et al., 2011), a dysmetabolic syndrome may be the starting point to promote lipoma formation and this assumption may help to explain the relative frequency compared with other neoplasias in aquaculture or in aquarium facilities reared fish.

References


Hard GC, Williams R and Lee J (1979). Survey


