NOTE

Metastatic fibrosarcoma in black seabream
(Spondyliosoma cantharus)

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Abstract
An adult male black sea bream, Spondyliosoma cantharus with a tumour showing a plaque shape and partially covering the eye was examined. The surface was smooth and white-greyish in colour with localised haemorrhage. Histologically, the neoplasm was characterized by spindle cells with basophilic well defined cytoplasm. In some areas, neoplastic cells showed atypical pleomorphism. Some parasitic bodies were detected within the neoplastic tissue. The diagnosis of metastatic fibrosarcoma was made.

Fibrosarcoma has been described in teleosts since the work of Schlumberger and Luckè (1948) and reported in goldfish (Carassius auratus) (Ahmed and Egusa 1980), striped mullet (Mugil cephalus) (Edwards and Overstreet, 1976), sockeye salmon (Oncorhynchus nerka) (Meyers and Hendricks, 1983), European eel (Anguilla anguilla), conger (Conger conger), cod (Gadus morhua), Japanese sea bass (Lateolabrax japonicus), searobin (Lepidotrigla alata), scorpionfish (Scorpaena porcus), European plaice (Pleuronectes platessa), Atlantic halibut (Hippoglossus hippoglossus), Black Sea turbot (Psetta maerotica) and turbot (Psetta maxima) (Mawdesley-Thomas, 1972). The current article reports a neoplasm in a Mediterranean sparid.

An adult male (520 g in weight) black seabream (Spondyliosoma cantharus), fished by a scuba-diver in the southern Tyrrhenian sea, was sent to the laboratory of the Unit of Veterinary Pathology, University of Messina (where tissues have been archived), for pathological examination because of the detection of a large mass on the head. Tumour and all tissue samples were collected two hours after death and fixed in 10% buffered formalin and then routinely processed for light microscopy. Transversal and longitudinal 4 μm thick sections were stained with Haematoxylin-Eosin and Masson’s modified trichrome techniques. At gross observation, the head mass partially covered the eye in its lower part (Figure 1a). The tumour had a plaque shape and measured
8x3.5 cm. The surface was smooth and white-greyish in colour showing loss of scales with diffuse haemorrhage. The mass extended through the gill operculum reaching its inner surface where a small whitish nodule was also observed. Another neoplastic growth was present in the frontal region; it measured 3.5x2.5 cm and was lobulated shaped, red in colour and fibrous in consistency. Close to this mass, a further small grey-red nodule (1x1.5 cm) was detected. In the spleen, under the serosa, a white-greyish nodule (0.2x0.3 cm) was also seen (Figure 1b).

Histologically, the neoplasm was characterized by spindle cells, with basophilic well defined cytoplasm. The whole mass appeared to be scarcely confined and invaded various areas of the host surrounding tissues, mainly skeletal muscles (Figure 1c). The vascularization was scarce. Nuclei were vesicular and sometimes hyperchromatic, often elongated and parallel to the longer axis of the cell. In some areas, neoplastic cells showed atypical pleomorphism, with large hyperchromatic nucleolated nuclei and strongly basophilic cytoplasm (Figure 1d). These cells were arranged in parallel or interwoven bundles oriented in a wavy or vorticous fashion. In areas where cellular atypia was detected, the tumour proliferation became more compact, showing densely packed cells always arranged in bundles with less intercellular substance. Mitoses were frequent and often atypical. High apoptotic index was also observed. Within the neoplastic tissue, some unidentified parasitic bodies, whose meaning remains to be elucidated, were also detected. The histological features of the splenic growth were similar to those above described (Figure 1e and 1f). The splenic nodule had a slight pseudocapsule, no features of granuloma and only a scarce cellular infiltrate.

Gross and histological findings were consistent with a diagnosis of fibrosarcoma. The malignancy of the tumour is demonstrated by the uncontrolled growth involving surrounding tissues, by the metastasis, atypia, pleomorphism, as well as by several mitoses. Metastases have been rarely detected in fish tumour due to the lack of those tissues and organs which typically develop malignant tumours in higher vertebrates, such as bone marrow, lymph nodes, uterus, mammary gland and lungs.

Fibrosarcoma has been already reported in fish, but never in this species. This tumours may recognize many causative agents, such as foreign bodies, viral and toxicological agents, as well as parasites (Stephens et al., 1983). Although some fish tumours, as in example liver neoplasms, have been suggested to play a role in indicating water pollution by carcinogens, which could otherwise go unnoticed, we could not confirm that heavy metal pollution was as a primary causative agent in this case. On the contrary, a possible role in conditioning the malignancy of the neoplasm could be hypothesized.

Otherwise, it is widely known that specific parasites have been linked to neoplasms in humans and in animals; particularly, Spirocerca lupi may induce oesophageal fibrosarcoma in dog (Stephens et al., 1983) and Cysticercus fasciolaris has been linked to liver fibrosarcomas (Hanes, 1995). Moreover, vaccination-induced (Hendrick and Brooks,
Figure 1. *Spondyliosoma cantharus* fibrosarcoma.

a) Head mass covering partially the eye. The surface was smooth, showing loss of scales, and white-greyish in colour with many haemorrhages.

b) Spleen metastasis (arrow)

c) Histological sections of the tumour showing sharp tendency to invade muscle fibres (H&E; bar 50μm)

d) Histological field of the mass with neoplastic cells showing atypical pleomorphism (H&E; bar 50μm)

e) Low magnification of the spleen metastasis (H&E; bar 250μm)

f) Particular of the neoplastic cells in the spleen showing similar patterns and arrangement to the cells of the primary tumour (H&E; bar 80μm)
1994) and post-traumatic fibrosarcomas (Dubielzig et al., 1990), as well as foreign body tumorigenesis (Brand et al., 1975) have been described in higher vertebrates. The role of parasites in the pathogenesis of the neoplasia described here remains unknown. Furthermore, the persistent inflammatory and immunologic reactions to adjuvants in vaccines or foreign bodies, as for example the same parasitic bodies observed in our case, could induce continued proliferation of resident mesenchymal cells that, sometimes, could appear to lead to neoplastic transformation of these cells.

References


