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CASE REPORT

Suspected Case of Rhabdomyosarcoma in a Cultured *Clarias gariepinus*

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INTRODUCTION

The over 30,000 species of fish so far reported in literature (Helfman *et al*., 2009) presumes an immense opportunity for discovery of numerous disorders, especially spontaneous neoplasia. However, information on neoplastic diseases is still poor because of the large size of the environment (rivers, ocean etc) the animals live, difficulty in tracking the individual fishes and the effects of autolysis and predation on vast majority of samples which limit observation of aquatic disorders to only zoo and aquarium populations, tropical and marine aquaria and cultured fish (Lombardini *et al*., 2014).

Because of the economic value of fishes, neoplastic diseases of aquatic animals are reported in fishes more than amphibians and reptiles as many of the tumors are observed during marketing and processing for consumption (Schlumberger and Lucke, 1948). Also, majority of such cases still unaccounted for as such cases are easily separated from the ones meant for the market and thrown away. Furthermore, the apparent low occurrence of rhabdomyosarcoma may not be unconnected to the tumor's low degree of differentiation which results in misdiagnosis in most cases (Vas *et al*., 1993).

Reports on neoplasms of fish include those of the urinary track (Nakatsuru *et al*., 2000; Lombardini *et al*., 2010, 2014), hepatic (Mikaelian *et al*., 1998), lymphosarcoma (Bowser *et al*., 1985; Earnest-Koons *et al*., 1997) and rhabdomyosarcoma (Haddow and Blake, 1933; Mousavi *et al*., 2016).

Rhabdomyosarcoma originates from striated muscle cells and sometimes from undifferentiated pluripotent cells (Kusewitt, 2012). Gross descriptions usually reveal an irregularly elevated, lobulated and relatively firm mass (Hendrick *et al*., 1998; Cooper and Valentine, 2002; Kusewitt, 2012). Microscopically, rhabdomyosarcoma can present as disorganized tissue composed of pleomorphic cells, usually fusiform to elongated, with marked anisokaryosis and sometimes multinucleated giant cells (Kusewitt, 2012). Cross striations may be present in histologic sections and normally are hard to detect but may be demonstrated by special stains such as phosphotungstic acid and haematoxylin (Hendrick *et al*., 1998; Cooper and Valentine, 2002). Poorly differentiated tumor cells can be demonstrated using specific antibodies against striated muscle desmin, vimentin and actin antigens in tissues (Skalli *et al*., 1988).

CASE REPORT

A 6-month–old cultured male *Clarias gariepinus* weighing 950g with a mass on the tail region was scooped with a fishing-net upon observation of sluggish movement in a concrete pond having about one thousand fish. The weight of the fish was relatively lower than majority of them in the pond though they were hatched at the same time. The mass was located intramuscularly towards the tail region of the fish (Figure 1) and was composed of two nodules measuring about 1 and 1.5 cm respectively with areas of necrosis at the centre (Figure 2).

Blood was collected from the caudal vein and haematological parameters determined following standard procedures. The fish was subsequently euthanized and the mass carefully extirpated and fixed in 10% buffered formal saline. The tissue sample was processed by conventional methods and sections of about 5µm were stained with Haematoxylin and eosin.

RESULTS AND DISCUSSION

Packed cell volume – 24% (31.00 - 35.00), Haemoglobin concentration - 7.90 g/dl (10.86 - 11.90), Red blood cell count – 1.80 x $10^{6/\mu l}$ (2.37 - 2.69), Mean corpuscular volume – 133.33 fl (136.02 - 141.95), Mean corpuscular haemoglobin – 43.89pg (40.37 - 45.82), Mean corpuscular haemoglobin concentration – 32.92 g/dl (31.03 - 35.03), White blood cell count – 18.45 x $10^{3/\mu l}$ (24.50 - 32.15).

The blood picture shows mild microcytic, normochromic anaemia considering the reduced values when compared with the reference ranges (Okorie-Kanu and Unakalamba, 2015) of packed cell volume and RBC count and MCV and suggest prolonged maturation process due to red blood cells pathology occasioned by the tumor cells. The significantly reduced WBC count could have resulted from exhaustion following prolonged elaboration of the cells to the tumor tissue as was observed in figure 3.

The cell morphology within the mass showed multinucleated and pleomorphic cells varying in appearance from elongated to round and strap-like cells haphazardly

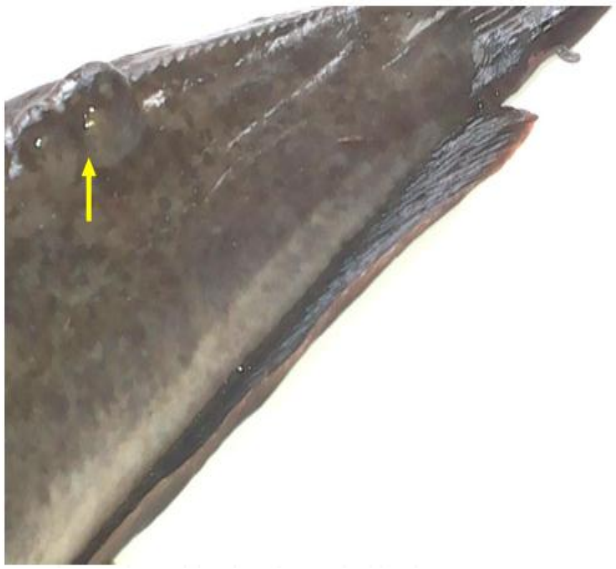

Figure 1: Tumor tissue at the caudal region of 6-month-old male *Clarias gariepinus*

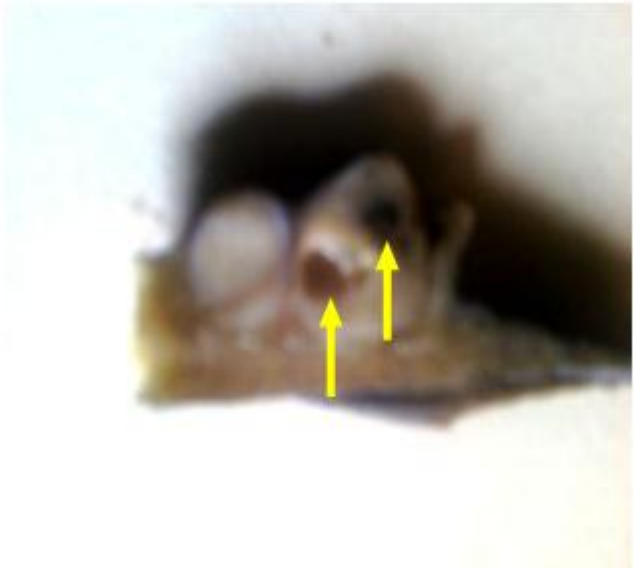

Figure 2: Necrotic areas on the centre of cut tumor tissue - arrows

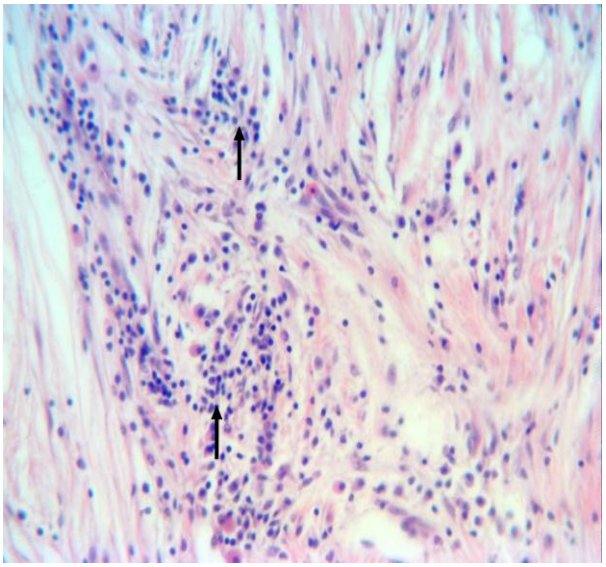

Figure 3: Massive infiltration of mononuclear cells and presence of mitotic cells in some segments of the tissue with striated tissue cells H&E x 400

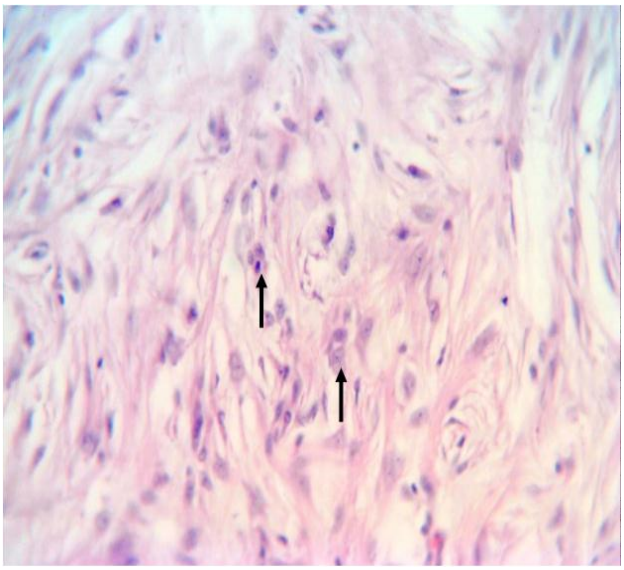

Figure 4: Multinucleated-arrows and pleomorphic tumor cells haphazardly arranged H&E x 400

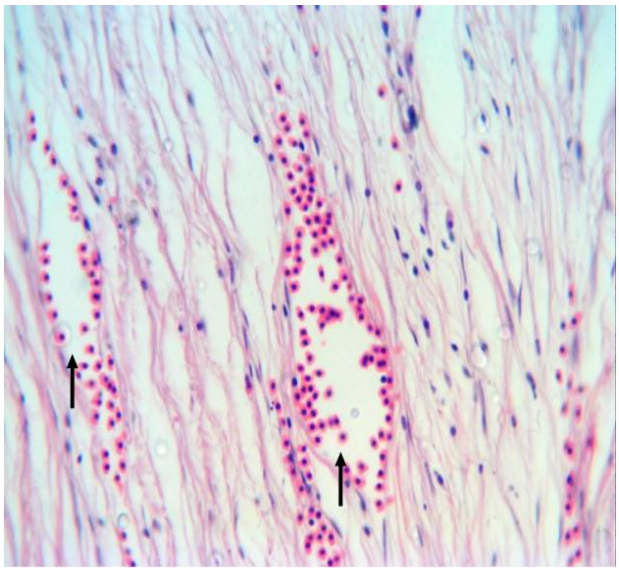

Figure 5: Well vascularized (arrows) tumor tissue with larger than normal capillaries H&E x 400

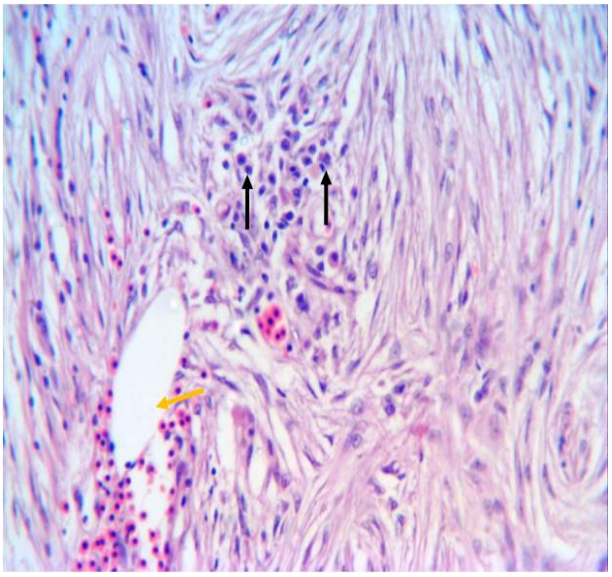

Figure 6: Well vascularized tumor tissue with wider than normal capillaries – yellow arrow, mitotic cells- black arrows and haphazardly arranged tissues H&E x 400

arranged (Figure 4). The tumor tissue was also well vascularized with larger than normal capillaries (Figures 5 and 6), a feature very important for growth and sustenance of tumor tissues and metastasis (Zhou *et al*., 2011; Kusewitt, 2012; Chen *et al*., 2015). There was also massive infiltration of mononuclear cells in some segments of the mass (Figure 3 and 6). This was a chronic inflammatory activity as tumor cells are perceived as foreign by the host's immunological apparatus.

This case was observed in February, 2014 and since that time, all the concrete ponds in the farm had been under close monitoring for cases but none was observed before this

report. This may suggest that the tumor could be congenital and not as a result of virus or poison. This is (to the knowledge of the authors) the first case of rhabdomyosarcoma in fish in Nigeria.

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