

## Polycystic kidney disease in goldfish: a statistical review

Notes on my goldfish cases with polycystic kidney disease (PKD) (1994-2021). **Key points**

**Number** (n=20): total cases confirmed = 20 over 27-year period = less than one per year

**Varieties:** 60% comets, 35% commons = 95% long bodied goldfish (5% = short-bodied oranda [1/20])

**Environment:** 75% outdoor pond, 15% indoor aquarium, 10% indoor pond

**Age** (yrs) where known (n=18): minimum 2yrs, maximum 10yrs, mean 6.2yrs

**Colour:** 35% white+ red/orange, 30% white, 25% orange/gold, 10% calico

*NB. Older goldfish commonly lose orange coloration and turn white so it is difficult to interpret the significance and if white coloration was a factor.*

**Duration:** minimum half day, maximum over 1yr, mean 5.2months

**Presentation:** 85% swollen body, 37% buoyancy disorder, 10% skin oedema, 10% ulceration

*NB. Some had a combination of clinical signs, and degree of body swelling was often related to the size of the kidneys, and lack of swelling was often because PKD was a coincidental finding. Over half of the fish continued to eat and swim (relatively) normally.*

**Buoyancy:** 37% had buoyancy disorder, most of which (71%) were on the bottom.

*NB. In my review of goldfish cases with buoyancy disorder, 17% were due to PKD.*

**Swelling:** the degree of swelling varied from none, when PKD was a coincidental finding and secondary to the primary problem, to severe and depended on the owner's degree of observation and desire to seek a professional opinion. The majority of cases (55%) had severe swelling.

**Symmetry:** 65% had asymmetrical body swelling, the remainder included those with no swelling.

*NB. The degree of asymmetry depended on the relative size of each kidney.*

**Radiography** (n=17): radiographic appearance depended on the degree of swelling of each kidney. All radiographs were taken with fish anaesthetised and out of water to achieve maximum radiographic detail. ALL fish had an increased amount of separation between the two swim bladder chambers. MOST fish had a visible margin to affected kidneys. There was often loss of radiographic contrast and coelomic tissue detail resulting in a uniform homogeneous radiographic appearance which was dependant on the size of the swollen kidneys. In cases with asymmetrical swollen kidneys, it was often possible to see separate posterior margins on lateral radiographic views. The posterior chamber of the swim bladder was displaced ventrally in 53%, and displaced laterally in 24% where kidneys were asymmetrical, most of which were also displaced ventrally.

**Ultrasound** (n=5): ALL cases had multiple large fluid-filled cavities of irregular shape and size.

*NB. The small number of cases is due to lack of diagnostic expertise and scanner availability.*

**Sex** (n=13): where gonads could be identified at necropsy, 69% were female and 31% were male.

**Histopathology** (n=11): NONE of the cases examined had parasites in the renal tissue.

*NB. The last case sent for histopath was in Oct'03 because it was apparent that there was little benefit to understanding the pathology, or for diagnostic confirmation.*