Acta vet. scand. 1985, *26*, 136—139.

Brief Communication

COLOBOMA OF THE OPTIC NERVE HEAD IN BENBAL TIGER KITTENS (Panthera tigris tigris)

Coloboma (Gr. = mutilation) means in ophthalmology a defect, partial or total, in an ocular structure, usually in the area of the embryonic cleft. Colobomata arising as a result of disturbed closure of the cleft are termed typical colobomata, in contrast to atypical colobomata of a different etiology.

Colobomata involving the disc and optic nerve are typical colobomata, and may be included in a total coloboma comprising the whole embryonic fissure or may be a partial coloboma in the posterior part involving only the disc and optic nerve.

Ocular colobomata have been reported in felidae (*Bellhorn et al.* 1971) including snow leopards (*Wahlberg et al.* 1982).

Two cases of bilateral coloboma of the optic nerve head in a litter of Bengal tigers are presented, and to our knowledge this defect has not previously been reported in Bengal tigers.

A litter of Bengal tigers comprising two 3-months-old kittens, one male and one female, was euthanatized due to extraordinarily small eyes and poor vision. Both kittens were well-fed and weighed 9.5 and 9.0 kg, respectively. The kittens had been vaccinated twice against panleukopenia, rhinotracheitis and calicivirus, i.e. at 5 weeks of age and at 8 weeks of age. There were no signs of concurrent disease. The parents were vaccinated 1 year earlier. The mother showed no signs of disease during pregnancy and no alterations in handling or feeding were accomplished. Vitamin supplement was regularly added to the food.

The parents had had 7 litters comprising approximately 25 kittens. None of these have shown signs of ocular disease.

Seven months after the litter concerned another litter was born. Of the 4 kittens in this, 2 died sortly after birth, probably killed by the mother. The 2 remaining kittens were examined ophthalmoscopically at 5 weeks of age and were found to be clinically normal.

Macroscopical examination. The eyes were enucleated immediately after euthanasia, fixed in 4 % buffered neutral formaldehyde for 24 h, measured in length, width and height, sectioned vertically and photographed.

1. (Lab. Nos. 113/84 & 114/84): Right and left eyes of male kitten. The eyes measured 22×22×22 mm and 22×22×21 mm. The optic nerves were 9 mm and 3 mm in length, respectively. No colobomata were observed.
2. (Lab. Nos. 115/84 & 116/84): Right and left eyes of female kitten.

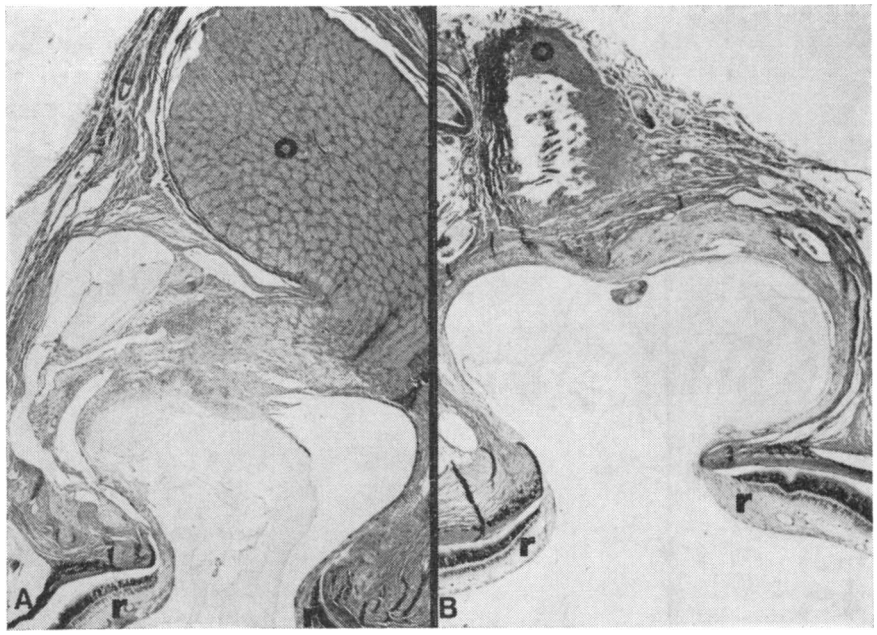

Figure 1 A, B. Colobomata of disc and optic nerve in right and left eye of male kitten (Lab. Nos. 113/84 & 114/84). o = optic nerve remnants, r = retina (× 17.5).

Lab. No. 115/84: The eyeball measured 12×15×13 mm. Because of a posterior defect, the eye had shrunk during processing. No optic nerve was seen.
Lab. No. 116/84: The eyeball measured 21×13×13 mm. The optic nerve was 3 mm in length and located on top of a posterior cystic defect in the disc area (Fig. 2 A, B) measuring 4×6×4 mm. The retina was totally detached, and the cataractous lens was luxated posteriorly.

Microscopical examination. The eyes were processed according to routine paraffin technique. Sections of 5 μm were stained with hematoxylin-eosin.
1. (Lab. Nos. 113/84 & 114/84). The sclera in both eyes was

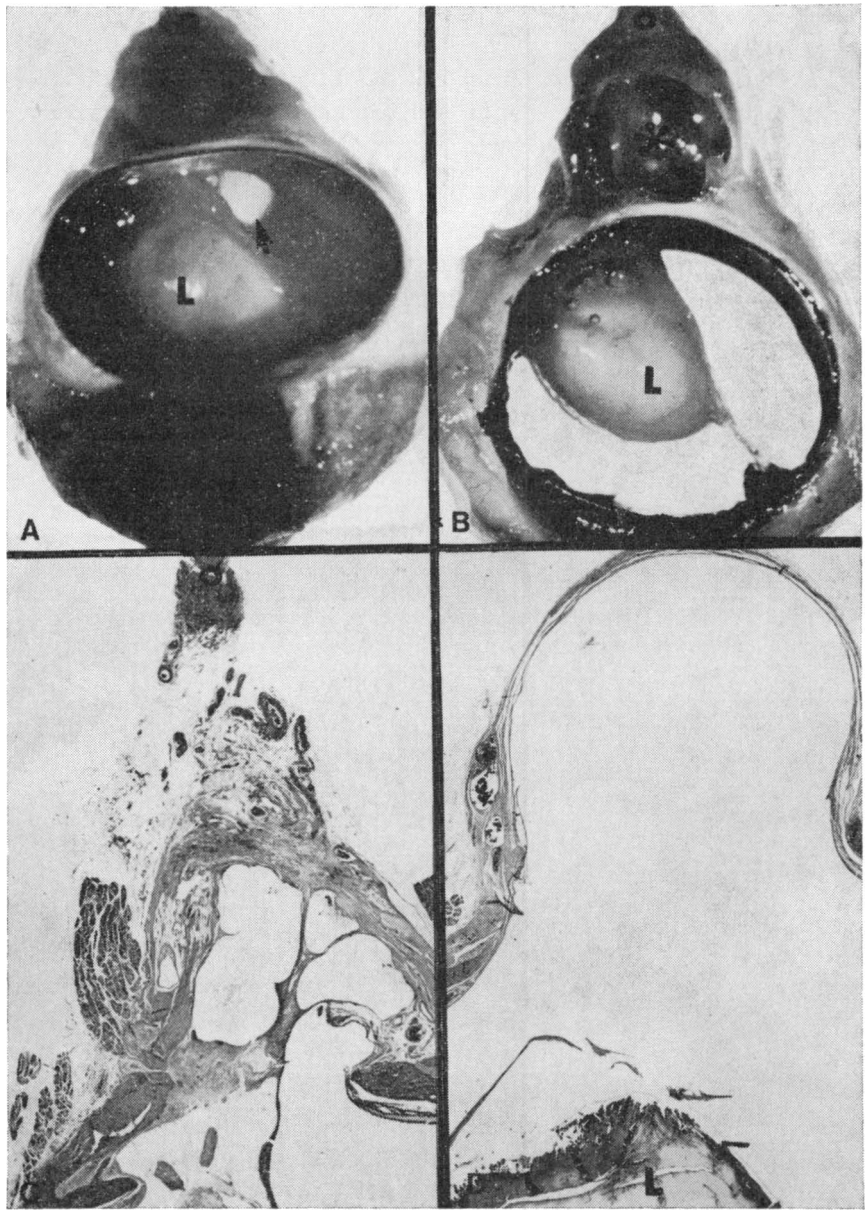

Figure 2 A. View into the interior of left eye of female kitten (Lab. No. 116/84). The superior calotte has been removed. Coloboma at arrow. L = lens, o = remnants of optic nerve (× 4).

Figure 2 B. Same as A. Both calottes removed. The coloboma cavity at asterisk. Abbreviations as above (× 4).

Figure 2 C, D. Various sections through the colobomatous area. In C, glial strands are crossing the cavity. D is a section through the middle of the coloboma (× 7).

thin posteriorly around an optic nerve head coloboma. The outside of the coloboma was covered with several large vessels (Fig. 1), whereas the inside was covered with glial tissue connected to normal retinal tissue outside the coloboma. Outside the cavity, a normal optic nerve was seen in the right eye (113/84). Only remnants of optic nerve tissue were seen in the left eye (114/84) (Fig. 1 B). Otherwise, the ocular structures were normal.

2. (Lab. 115/84). In this shrunken eye, a large posterior defect in the sclera was seen. The retina was totally detached and formed strands behind the cataractous lens continuous with glial tissue in the large posterior coloboma. No optic nerve was observed. Otherwise the ocular structures were normal. (Lab. No. 116/84). A large posterior scleral defect was seen (Fig. 2). The retina was totally detached and degenerated with fibrosis and gliosis. No normal retinal structures were discernible. The lens was cataractous. At the site of the optic nerve head, a large coloboma containing glial tissue was seen. Sections through the middle of the coloboma revealed a large thin-walled cavity without remnants of optic nerve tissue (Fig. 2 D). Otherwise the ocular structures were normal.

Both in animals and man, colobomata are considered to be hereditary, transmitted as an irregularly dominant trait with varying penetrance (*Duke-Elder* 1964).

In the present case there was no indication of an hereditary basis for the malformation, since the same parents had normal litters both before and after the present litter. Also, no indication of environmental influence was found.

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(Received December 17, 1984).

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