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## Metastatic Squamous Cell Carcinoma in a Beached California Sea Lion (*Zalophus californianus*)

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A stranded adult female California sea lion was rescued at La Jolla, California on 19 April 1984 and transported to Sea World, San Diego, for medical evaluation as part of Sea World's beached animal rescue program. At the time of rescue the animal was dyspneic and had a bilateral mucopurulent nasal discharge. Three wk prior to death the sea lion became progressively more dyspneic, in spite of antibiotic therapy. Fecal analysis at the time of initial examination revealed a high concentration of eggs of *Contracaecum osculatum* and *Zalophotrema hepaticum*, and larvae of *Parafilaroides decorus*. Although emaciated, the animal initially had a good appetite and gained weight steadily. However, her appetite subsequently declined steadily until the time of death on 28 May 1984.

Whitish nodules (1 to 2 cm in diameter), which glistened on cut surface and contained soft, necrotic centers, were found throughout the lungs. The liver was congested and had many nodules, similar in appearance and size to those in the lungs, in all lobes. A mesenteric lymph node contained a single nodule measuring 0.5 mm in diameter. The right kidney contained numerous miliary nodules and a yellow exudate was present within the pelvices. The right ovary also contained miliary nodules. Additionally about 4 liters of serous, yellow fluid was present within the thoracic cavity. The pleura was thickened with numerous adhesions to the

thoracic wall. Numerous adult lungworms (*P. decorus*) were found in the bronchial lumina, which also contained clear fluid. The tracheal mucosa was hemorrhagic and congested. Other findings included large numbers of nematodes (*C. osculatum*) and several ulcers, 4 cm in diameter, as well as several smaller ones, in the cardiac re-

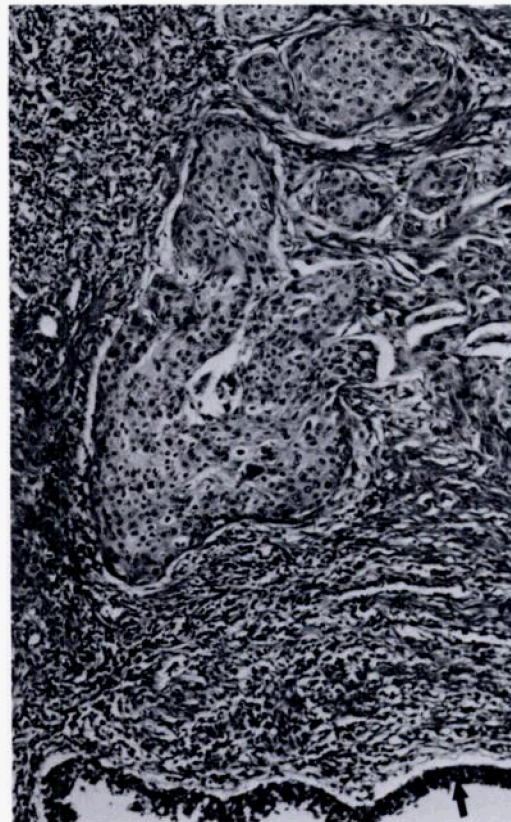


FIGURE 1. Kidney of a California sea lion with multiple foci of squamous cell carcinoma in the renal parenchyma. Renal pelvis (arrow). H&E,  $\times 100$ .

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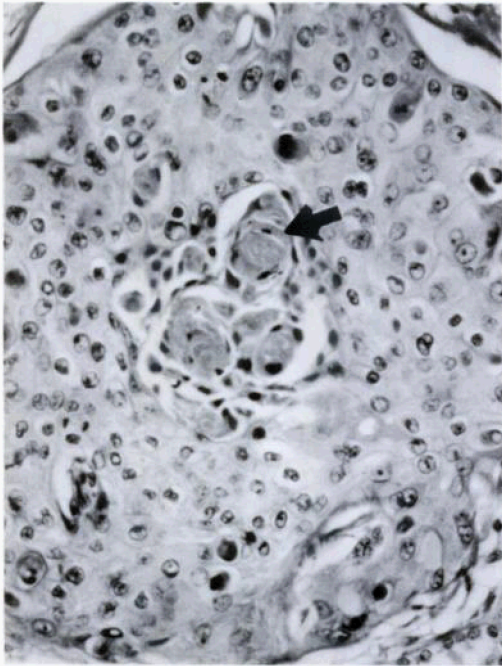


FIGURE 2. Higher magnification of another section of Figure 1 illustrating a focal area of keratinization (arrow). H&E,  $\times 250$ .

gion of the stomach. The mucosal wall of the urinary bladder was rough and thickened. Small abscesses were present within the skeletal muscle of the pelvic region, possibly as a result of intramuscular injections.

Histological examination of the nodules in the kidney, lungs, liver, ovary, and lymph node revealed a squamous cell carcinoma. The tumors were composed of a highly cellular neoplastic tissue containing epithelial cells arranged in large masses or cords (Fig. 1) without any attempts to form glandular structures. There was a minimal amount of stromal tissue. Intercellular bridges could not be demonstrated; however, concentrically laminated masses of keratin were occasionally found in some areas (Fig. 2). Mitotic figures were common.

The widespread distribution of malignant cells in this animal made it impossible to determine the primary locus of neo-

plasia. It may be speculated that the tumors originated from the renal pelvis resulting from squamous metaplasia of the transitional epithelium of the pelvic mucosa. Unfortunately, no bladder tissue was retained for histopathological examination.

Another possible site of neoplastic origin is within the genital tract. In one survey of neoplasia in pinnipeds the genital tract was the most frequent site of tumors (16 of 35 cases) (Howard et al., 1984, *In Pathobiology of Marine Mammal Diseases*, Howard (ed.), CRC Press, Boca Raton, Florida, pp. 120–232). However, only one of these cases was diagnosed as a squamous cell carcinoma of the cervix and vagina.

The respiratory tract is another possible site of origin. In the survey previously mentioned five primary lung tumors were reported (Howard et al., 1984, *op. cit.*). Four of the five tumors were diagnosed as squamous cell carcinoma originating from the bronchial mucosa, with metastasis to the bronchial lymph nodes.

At one time neoplastic disease was considered uncommon in marine mammals, but improved observation and reporting have revealed many cases in recent years (Howard et al., 1984, *op. cit.*). In a survey of 35 cases of neoplasia in pinnipeds, 60% of the tumors were reported as malignant (Howard et al., 1984, *op. cit.*). It was suggested in this latter survey that a higher prevalence of neoplasia in the lung, biliary tract and genital tract may be due to chronic low concentrations of organochlorines in the marine environment.

This tumor has been deposited in the Registry of Comparative Pathology at the Armed Forces Institute of Pathology under AFIP 1942173.

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## Craniofacial Tumors of the Koala (*Phascolarctos cinereus*)

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Bone tumors of the skull are uncommon in domestic animals and virtually unrecorded in wildlife species. No reports of such tumors in koalas could be found in the literature.

A mature male koala (A) was found in a depressed condition and with a swelling of the right maxillary area. It died shortly after presentation and was examined at necropsy. Tissues for microscopic examination were fixed in 10% phosphate buffered (pH 7.0) formalin, embedded in paraffin by standard methods and stained with hematoxylin and eosin, and toluidine blue. Bone tissue was decalcified in a solution of trisodium citrate and formic acid prior to embedding.

Both kidneys appeared smaller than normal with irregular fibrosis of the cortex. There was a discrete bone-textured mass (3 to 4 cm in diameter) occupying the right nasal passages and frontal sinus and causing compression of the right maxillary sinus and deviation and erosion of the nasal septum (Fig. 1). The right nasopharyngeal meatus was totally occluded in the middle portion and there was some occlusion of the left meatus. The mass was pale, cream-colored with irregular thin soft-textured grey areas throughout, and a white translucent appearance of vari-

able thickness around the periphery. All other organs appeared normal.

Histologically, the kidney showed large areas of segmental interstitial fibrosis, tubular dilation, and glomerular shrinkage. The tubular epithelium was endothelial-like in appearance, with loss of apical cytoplasm, but with retention of nuclei. Approximately 50% of the kidney showed this change with the remaining tissue appearing histologically normal. The bone-textured mass had aggregates of monomorphic undifferentiated sarcomatous cells around its margins (Fig. 2). There were scattered areas of variably mature cartilage throughout the substance of the growth. The chondrocytes appeared hy-

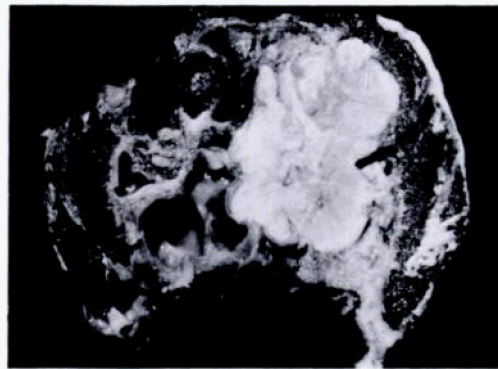


FIGURE 1. Transverse section of the nasal cavity of koala A showing a bony-textured mass occupying the right nasal meatus and frontal sinus. The left meatus is partly occluded.

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