NEOPLASMS IN THE LOWER PRIMATES, WITH A DESCRIPTION OF AN OSTEOGENIC SARCOMA OF THE JAW IN A MACACUS RHEUS

HALSEY J. BAGG
Douglas Research Laboratory, Memorial Hospital and Cornell University Medical College, New York City

The presence of neoplasms in wild and captive animals has frequently been reported. They appear with varying frequency in different species and apparently are more common in the rodentia and carnivora than in the lower primates. In over seven hundred autopsies of primates recorded at the Philadelphia Zoological Gardens (1) only five tumors were noted. They are as follows: a hypernephroma in a brown Cebus; a papillary adenoma of the gastric mucosa in a Hamandryas baboon; an adenocarcinoma of the rectum of a Macacus pileatus with extensions to the prostate; an adenocarcinoma involving the head of the pancreas in a Grivet monkey, and finally a giant-cell tumor of the ulna of a Chacma baboon with metastases to the lungs, heart, and gluteus muscles (2).

Only two tumors in primates have been reported from the London Zoological Gardens. One was described as a sarcoma of the scalp of a Cercopitheque, and another as an adenosarcoma of the kidney of an Ouakari (3, 4).

The following case presents several features of interest. In March 1929 an adult female Macacus rhesus monkey was purchased from a dealer. It showed a firm, solid tumor of the outer aspect of the left side of the lower jaw. The overlying skin was intact, and the size of the mass was approximately 4 x 3 x 3 cm. The condition of the lesion at this time is shown in Fig. 1.

There is no information available as to the length of time that this swelling had been present, as the animal had been imported by the dealer only a few days before it reached the laboratory.

X-ray films of the head and chest were taken on March 28, 1929. The report of Dr. Herendeen, the roentgenologist, is as follows: "The films of the left inferior maxilla reveal evidence of a destructive and productive process involving almost the entire
horizontal ramus (see Fig. 2). The bulging appearance of the inferior margin suggests that the process may be medullary in origin, but this is not certain, inasmuch as the radiating lines of bone spicules suggest that the tumor may be of the so-called periosteal type of osteogenic sarcoma. The film of the chest shows a shadow opposite the level of the anterior end of the third rib on the right side rather characteristic of sarcoma metastasis to the lung.”

On April 11, 1929, a specimen of the growth was removed for histologic examination (Fig. 5). Approximately 6 mm. below the skin the tumor tissue was vascular, solid, and white. In addition, an autotransplantation of the tumor tissue was made into the subcutaneous tissues of the right side of the jaw and to the left axilla of the monkey. Transplantations were also made into the axillae of two young adult females of the same species.

The microscopic description of the tumor is as follows: spindle-cell sarcoma, osteogenic type, not very cellular. The cells are
moderately hyperchromatic. The intercellular tissue is mucinous. The section shows no bone formation. Histologically the tumor appears to be not very malignant.

The skin incision made at the time of the biopsy healed promptly. There was no evidence of growth of the two autotransplantations from March 11 to May 6.

On May 6 the size of the tumor was approximately 4.5 x 3.5 x 3.5 cm. when it was treated with approximately three skin erythema doses of x-rays over the lateral and inferior surfaces. An oil immersion tube was used at 30 cm. distance for fifteen minutes of exposure. The filtration was 2 mm. of aluminum, the voltage 145, and milliamperes 30.

Ten days after the treatment there was beginning desquamation of the skin, with excessive salivary activity. The tumor became markedly inflamed, swollen, and apparently tender, but the skin remained intact until July 16, when surface ulceration appeared.
FIG. 3. TUMOR OF THE JAW AFTER DEATH, JULY 23, 1929

FIG. 4. THE SKULL, SHOWING THE EXTENT OF THE TUMOR PROCESS AND NEW BONE FORMATION
Infection, constant picking at the growth by the animal, and the presence of fly larvae in the ulcer produced the partial excavation of the tumor which is illustrated in Fig. 3. This photograph was taken on July 23, 1929, and as the general physical condition of the animal was poor, it was killed at this time.

X-ray films of the jaw, lungs, and the entire skeleton were made soon after death. The roentgenologic report was that "as far as comparison in films made before and following the irradiation is concerned, very little change in the tumor process is shown. It may be that some of the loss of density shown in the films of the tumor made after irradiation is due to destruction of its soft cellular constituents. There is no evidence of further extension or growth of the tumor. As far as could be determined in the films of the skeleton, no further bone involvement was found." The x-ray films of the chest at this time were apparently negative.

The extent of the destructive tumor process of the lower jaw is shown in Fig. 4. A considerable portion of the finer elements of the bony constituents of the tumor has been lost in the process of macerating and cleaning the skull.

The autopsy findings showed an apparent absence of metastasis in the lungs and of involvement of other portions of the skeleton,
and the viscera were apparently normal. The tumor measured 30 x 25 x 20 mm., was firm, ulcerating on the surface, and filled with ramifying bony spicules. There was considerable displacement of the teeth adjacent to the tumor, which occupied practically all of the horizontal ramus of the left side of the lower jaw.

The attempt at autotransplantation of the tumor was apparently negative. There was apparently no growth of the transplants which were placed in the two adult female monkeys, as noted at the end of fifteen months.

SUMMARY

This paper describes an osteogenic spindle-cell sarcoma of the lower jaw of an adult Macacus rhesus monkey. Microscopically the tumor was composed of spindle cells, moderately hyperchromatic, not very cellular, and with mucinous intercellular tissue, but no evidence of bone formation in the section examined.

The growth of the tumor was apparently arrested by heavy roentgen-ray treatments, but the tumor soon became ulcerative and infected, and the animal was killed. There apparently was no extension of the tumor process by metastases. One small mass that was noted in the x-ray plate of the right lung before treatment had apparently disappeared from the x-ray picture at death, and at autopsy careful gross examination and section of the lungs revealed no tumor process. It is possible that the mass in the lungs was a metastatic nodule which regressed spontaneously. We have no evidence that it was directly affected by the roentgen-ray treatment of the jaw tumor.

Attempts at autotransplantation of the tumor failed, as well as transplantation into two monkeys of the same species.

Only seven other reports of neoplasms in the lower primates were found in the available literature.

REFERENCES