Attempted Induction of Sarcoma in a Cape Chacma Baboon with the Snyder-Theilen Feline Sarcoma Virus

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SUMMARY

A 21½-month-old male Cape Chacma baboon was inoculated subcutaneously with a large amount of material from fibrosarcoma induced in a kitten with the Snyder-Theilen fibrosarcoma virus (ST-FSV). Within one week a small tumour developed at the site of inoculation. Initially it increased slightly in size and then rapidly regressed and disappeared. Heavy immunosuppression failed to cause recurrence of the tumour. The evidence suggests that immunologically mature baboons are highly refractory to oncogenesis by ST-FSV, and this may also apply to humans.


The Snyder-Theilen fibrosarcoma virus (ST-FSV) readily induces fibrosarcomas across species barriers,1-3 and has been reported to transform human tissue culture morphologically.4-5 Active research is currently being undertaken with ST-FSV and thus laboratory workers are constantly at risk of accidental exposure to the virus.

MATERIAL AND METHODS

As it is not known whether man or the baboon is susceptible to the oncogenic effects of the virus, a 21½-month-old male Cape Chacma baboon (Papio ursinus) was injected subcutaneously and intramuscularly with material obtained from a kitten fibrosarcoma (Fig. 1), that had been experimentally induced with ST-FSV. This inoculum was prepared by homogenizing a piece of the tumour in phosphate-buffered saline (50%, w/v), and resuspending the pellet produced by light centrifugation in the original volume of PBS. Two-and-a-half millilitres of this suspension was used for the subcutaneous injection, and 2 ml for the intramuscular injection.

One week after inoculation a small tumour about 2 cm in diameter was observed at the site of the subcutaneous inoculation. It was firm and elastic in consistency, similar to fibrosarcomas experimentally induced in dogs and cats with ST-FSV. Three days later it had increased to approximately 3 cm in diameter (Fig. 2), but thereafter it gradually regressed and by 5 weeks postinjection it was no longer palpable. No biopsy was performed.

No changes were detected at the site of the intramuscular injection.

Seven weeks after disappearance of the subcutaneous tumour the baboon was given an intensive course of treatment with immunosuppressive drugs consisting of 5 treatments of 10-12 ml of antihuman lymphocyte globulin (horse anti-lymphocyte globulin; Behringwerke batch 587302) given either all intravenously, or half intravenously and half subcutaneously at 2-5-day intervals; azathioprine intravenously (Imuran injectable; Burroughs Wellcome), and prednisolone (Meticortelone soluble intravenous; Scherag) intramuscularly biweekly over a period of about 5 weeks—the dosage of the former was progressively increased from 9.2 mg/kg to 28.6 mg/kg, and the latter from 2.4 mg/kg to 5.7 mg/kg. At no stage were any abnormalities observed. About 9 weeks after the cessation of treatment the baboon was killed and an autopsy performed. Histological sections from the sites of inoculation of the feline sarcoma material as well as from many other situations were prepared. No abnormalities were detected, either macroscopically or microscopically.

The amount of virus in the inoculum the baboon received was not quantitated, but it was probably substantial, since 1 ml amounts of supernatant fluid of the same tumour homogenate induced fibrosarcomas visible at one week at
Fig. 2. Appearance of the subcutaneously located tumour in the baboon 10 days after injection of material derived from the kitten fibrosarcoma.

Fig. 3. Appearance of a subcutaneously located fibrosarcoma in a pup produced by inoculation of material derived from the same kitten fibrosarcoma 24 days previously.

the site of subcutaneous inoculation in 4 out of 5 pups. The tumours in 2 of the pups were very large, as shown in Fig. 3.

**DISCUSSION**

Since biopsy specimens of tumour in the baboon were not examined it could not be definitely established that a sarcoma had been induced. The inoculum either failed to induce a sarcoma at all, or caused the formation of a neoplasm which regressed rapidly. Several studies have indicated that adult animals, including cats, are considerably more resistant to the oncogenic effects of feline sarcoma viruses than foetuses and newly-born animals.1,4,5 Heavy immunosuppressive therapy in the baboon failed to cause reappearance of a tumour. It is of interest to note that the tumour did not reappear after cessation of azathioprine treatment, proving that this was not inhibiting growth of neoplastic cells. At autopsy no evidence of neoplasia was detected, confirming that the immune mechanism of the baboon either prevented development of the tumour altogether or caused regression of growth after a short period, but this does not exclude the possibility that ST-FSV genetic material could have been incorporated into some of the baboon’s cells. The evidence thus suggests that immunologically mature baboons are highly refractory to oncogenesis by ST-FSV, and this may also apply to adult humans. It may be relevant that in a recent epidemiological study no association of human cancer was found with feline malignant lymphoma, which is produced by viruses very closely related to feline fibrosarcoma viruses.6 These feline malignant lymphoma viruses have been known to occur with feline sarcoma viruses.5,6

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**REFERENCES**