

Gray
Blau

Sonderdruck aus
Verhandlungsbericht des
XV. Internationalen Symposiums über die Erkrankungen
der Zootiere

Kolmården 1973



AKADEMIE-VERLAG · BERLIN

1973

From the Arthritis Institute of the National Orthopaedic and Rehabilitation Hospital, Arlington, Virginia, and The National Zoological Park, Smithsonian Institution, Washington

RHEUMATOID TYPE ARTHRITIS NATURALLY OCCURRING IN A GORILLA
A THREE YEAR FOLLOW-UP REPORT OF A MECHANISTIC APPROACH TO TREATMENT

By T. Brown, H.W. Clark, J.S. Bailey,
and C.W. Gray

The male gorilla, Tomoka, was the first gorilla to be born at the National Zoological Park of the Smithsonian Institution in Washington, D.C., and believed to be the second to be born in a zoological park in the United States, on 9th September 1961. His medical history was uneventful except for a Shigella-salmonella enteritis at the age of thirteen months and an attack of balantidium enteritis in 1967.

Occasional lameness and swollen joints had been observed since 1966. The swelling was migratory and involved the right leg, the right foot, and would shift to the left hand, back to the right foot, then to the left foot, and so on. Treatments included analgesics and cortico-steroids which would have some beneficial effect, but the next time lameness developed, the same treatment was frequently ineffective. Consultations with pediatricians and orthopedic specialists were nonproductive in developing an effective therapeutic regimen to correct the condition. Tomoka was immobilized in March 1969, and at that time blood samples as well as articular and extremity radiographs were taken for study by Drs. Brown and Gray.

The history, physical findings, and laboratory tests on Tomoka were pathologically consistent with rheumatoid type arthritis and included stunted growth, elevated serum gamma globulin, positive rheumatoid factor test, and a nonspecific inflammatory reaction in the synovial tissue. Radiographic examination revealed no abnormalities on the articular surfaces which are also consistent with a diagnosis of rheumatoid type arthritis.

Joint capsule biopsy and the collection of synovial fluid was proposed to make the diagnosis definitive. Following immobilization in March 1969, the joint capsule was biopsied and synovial fluid was taken for culture of both bacteria and mycoplasma. Concurrently, treatment was started using 1 gm of oxytetracycline in 250 cc of 5 percent dextrose in water administered by an intravenous drip. Immobilization was necessary to permit biweekly treatment.

The clinical response to this treatment was an immediate improvement in movement and disposition of the animal. The gorilla weighed 113 pounds in April 1967, and at the time of the first immobilization, 9 March 1969, the gorilla weighed 137 pounds for a gain of only 24 pounds in 21 months. Four months following the initiation of treatment in March 1969, Tomoka had gained a total of 41 pounds. The rapid weight gain continued and at present the gorilla weighs 315 pounds which is considered normal for his age.

The natural occurrence of classical rheumatoid type arthritis in a gorilla observed at the National Zoo in Washington, D. C. was reported by Brown, et al. in 1970 as an original finding. It was suggested that the immunologic nearness of the gorilla to man exemplified by the close similarity of blood types made this happenstance possible. The primate was seriously disabled not only from severe multiple joint involvement but with other characteristic rheumatoid expressions, such as failure to gain weight and grow normally, weakness, fatigue and depression. The most significant laboratory findings in support of the diagnosis of rheumatoid disease were a positive rheumatoid factor (BFT) and greatly elevated gamma globulin. The biopsy specimen from the wrist synovium also revealed findings characteristic of rheumatoid type inflammation.

The treatment plan which was successful after nearly thirty attempts had failed with a variety of medication, was based upon a concept of disease mechanism evolved through long-term

continuity studies of rheumatoid disease in humans where mycoplasma were considered the primary persistent antigenic source, promoting the rheumatoid hypersensitivity state. Evidence of obscure mycoplasma infection in the gorilla was provided by the isolation of mycoplasma from the throat, the presence of mycoplasma antigen of the same type from wrist joint synovium, and a Jarisch-Herxheimer effect at the beginning of antimycoplasma intravenous therapy followed by a rise and subsequent fall of the complement fixing antibody titer to mycoplasma during therapy.

The intravenous route was chosen for the administration of either tetracycline or lincomycin, both of which possessed potent antimycoplasma effects. Dosages of 1000 to 1500 mgm in 500 cc 5 % dextrose were administered in the attempt to achieve cellular penetrance and reach the sensitizing intracellular parasitic agent. After many months of such treatment, administered at 2 to 6 week intervals, the joint symptoms cleared completely and there was a general constitutional improvement with continuous gain in weight. For the three years of illness prior to the specific treatment program there was a striking failure to gain weight.

Oral administration was substituted for the intravenous route after 22 months and the gorilla remained clinically well until December 1971, the 31st month following the initiation of treatment. At this time a flare reaction occurred in the 1st and 2nd metatarsal phalangeal joints of the left foot. There was no evidence of a return of the systemic disease in a clinical sense except for failure to continue to gain weight and minimal worsening of the laboratory findings during the flare period.

The intravenous therapy was resumed at two week intervals and lincomycin was injected repetitively in the affected joint areas in an attempt to penetrate the inflammatory barrier. Gradual joint improvement followed and there was a re-establishment of the state of remission in association with the method of treatment.

The behavior pattern of the disease over a 3-year period of treatment and follow-up laboratory studies has been classically that of the rheumatoid arthritis hypersensitivity state as seen in man. The findings lend support to the infective theory in the pathogenesis of rheumatoid arthritis and point the way to a new basic and more effective approach in treatment.

It is hoped through international awareness of the present study with intermittent reporting of follow-up findings, that similar examples of rheumatoid expressions in primates will be discovered and studied in a comparable manner. The original report did bring to our attention two other gorillas with the same apparent disease process. Cooperative studies are now underway to report these additional cases.

Summary:

A rheumatoid type arthritis in a gorilla is described. The behavior pattern of the disease over 3-year period of treatment and follow-up laboratory studies has been classically that of the rheumatoid arthritis hypersensitivity state as seen in man.

Zusammenfassung:

Es wird eine rheumatische Arthritis bei einem Gorilla beschrieben. Der Verlauf der Erkrankung während einer dreijährigen Behandlung und die Ergebnisse der durchgeführten Laboratoriumsuntersuchungen waren für eine hypersensitive Form von Gelenkrheumatismus, wie sie beim Menschen beobachtet wird, charakteristisch.

Résumé:

Description d'une arthrite rhumatismale chez un gorille. L'évolution de la maladie pendant un traitement de trois ans et les résultats des examens de laboratoire étaient caractéristiques pour une forme hypersensitive de rhumatisme articulaire tel qu'on l'observe chez l'homme.

Резюме:

Сообщается о ревматическом артрите, обнаруженном у гориллы. Обсуждается течение заболевания, период трехгодичного лечения, результаты проведенных лабораторных исследований, все это указывает на характерную гиперзентивную форму суставного ревматизма, подобного человеческому.

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Address of author: Thomas McP. Brown
Arthritis Institute of National Orthopaedic and Rehabilitation
Hospital, Arlington, Virginia (USA)