

Translation of the paper:

Arbeitsbedingte Krankheitsbilder: Hernia perinealis, Bursitis praepatellaris und Tyloma olecrani bei Zirkuselefanten (*Elephas maximus*)

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Regular physical exercise, as is required by circus elephants during their daily work programme, improves and stabilises the heart - and circulation function. Absent training worsens it. Through comparative electro-cardiographic investigations on circus and zoo elephants, the importance of daily exercise to the health was proven (Mill & Kuntze 1978): Dynamic exercise corresponds to the physiological needs of the elephant. Static strain and overstraining of specific body parts initiate patho-physiological reactions and finally illnesses as is described.

Casuistry

1. Hernia Perinealis: During the tour of 1982 an occasional lump was seen under the tail of the six year old Dina and, with increasing frequency, blood in her faeces occurred.

The well-nourished lively elephant moves physiologically and reacts to environmental influences in a typical manner. She only reluctantly obeys to the command to stand on her hind legs and only for a very short period of time: Now visible on the perineum, about 25 -30 cm below the anus, there is a football sized lump, which can be pushed in and is obviously painful, which disappears as soon as the animal stands on all four legs again. A hernia cannot be felt either by palpating the skin or by rectal examination. The trainer is advised to refrain from any further unnatural strain (riding a bicycle, standing on one or both hind legs, sitting). Furthermore he was informed that any prolapsed organ (bladder, uterus, intestines) could be strangulated, compressed or squeezed so tightly, that it becomes necrotic, which would result in death of the animal! Since then no further blood was seen in the faeces. The hernia of the now 11 year old elephant is the size of a medicine ball and only visible when she does the final trick (which they won't do without!) of "mounting". A Tenesmusani is conspicuous, which only occurs regularly during the several minutes long working session in the arena. Although Dina, as all the other elephants in the group, is made to defecate just prior to the performance.

2. Bursitis praepatellaris: In three adult female elephants a course, non-fluctuating, fist to child-head- sized painful swelling in the skin around the knee joint was diagnosed as cause of lameness, which could only be eliminated once by conservative methods (red light, microwaves, treatment with ointments, Kuntze 1980). The course-skinned, unmoveable, painful contraction of the two other females increasingly obstructed their working ability, so that they had to be totally removed by operation. In one elephant the new formation was histologically diagnosed as chronic fibrosing bursitis, in the second elephant an encapsulated abscess of strong connecting tissue with additional micro abscesses in the vicinity was diagnosed.

3. Tylomaoleacrani: The skin over the elbow hump is very crusted in all our Asian circus elephants. Next to rough calluses in some animals hyper horny growths were found, which in one case formed like a rough comb, had grown into horny cones curved like bear claws. Touching of the cones, obviously were painful to the animal. As conservative measures were unsuccessful, the up to 8 cm long and 1 cm wide cones were grind down with a grinding instrument under Xyalin (750 mg i.v.)

(Kuntze 1989). They were so hard, that several microtom knives broke during the histological examination.

Discussion

All three symptoms are a result of chronic un-physiological irritation. Perineal hernias are the result of excessive force (pressure, pull, push) on the pelvic diaphragm. In domestic animals, especially dogs, hormones and age related factors enhance their emergence. In large domestic animals perineal hernias are very seldom symptoms (Bolz et al 1968), which can occur in cattle after complicated births (Bolz and Dietz 1985). The perineal hernia in elephants is mentioned by Stehlik (1967).

As cause of the sufferings by Dina, age related and hormone related factors can be eliminated with certainty. Firmness and load-bearing capacity of the pelvic diaphragm correspond in this young healthy animal to the physiological requirements: walking, defecation, urination, parturition, occasional standing on hind legs (to reach branches). The elephant, who is very keen to learn, was trained to ride a bicycle. Whereby the elephant had to take up a – for elephants totally un-physiological - sitting position, and in addition had to perform heavy muscle work by alternatingly treading the pedals with her hind legs. Not only the thereby heavily used stomach muscles and the pressure of the intestines which were mechanically dropped into the pelvic space, but above all the additional pressure-pull impulses of the strong hind legs accrued to mechanic overload, with which the pelvic diaphragm could not cope. An operational correction of the ailment - different to dogs - does not seem feasible. First because of the mass and counter pressure of the abdominal organs a secure and permanent closure cannot be ensured. On the other hand certain tricks are unavoidable with elephants (e.g. mounting). The animal displays unmistakably during the performance (tenesmusani) that it feels pain during mounting. Lindau (1970), who thought a lot about the frequent lameness in circus elephants, concluded that many tricks (standing on one leg, mounting) leads to premature wear and tear of tendons, muscles and joints. It is the duty of the veterinary to recognise health hazards of his patients and to inform and warn the trainer before the tricks are learnt. These are not only the above mentioned tricks, but also kneeling and crawling. A free living elephants does neither kneel nor crawl. Already Hammer (1939) noticed Bursitis praepatellaris as well as the elbow growths in working elephants, which result from “kneeling on hard ground” and if neglected result in “horrible wounds, which take a very long time to heal”. He advised to let the animals “kneel as short as possible and to load them quickly”. Schulze and Steuer (1961) describe the Bursitis praepatellaris of a 6- 7 year old female elephant, who “was capable of performing many tricks” and thereby placed great strain on her right knee.