

SHORT COMMUNICATION

Clinical Studies on Sciatic Nerve Neurectomy in Chickens

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Sciatic nerve neurectomy on six Nigerian local cocks was conducted and clinical manifestation arising from the damaged nerve observed.

In unilateral neurectomized birds, the affected limb hung loosely with stifle and hock joints extended and the fetlock and pastern joints were flexed, while there was total paralysis of both limbs in bilateral sciatic neurectomized birds.

These results suggest that resection of sciatic nerve may be associated with lameness and paralysis of the affected limbs in chickens.

Keywords: Neurectomy, Sciatic nerve, chickens.

Introduction

In the chickens, the sciatic nerve, obturator nerve and the sacral nerve originate from the lumbosacral plexus which also arises from the first to the 8th lumbosacral nerves (Yasuad, 1961). Sciatic and obturator nerves principally innervate the hindlimbs in animals (Ghoshal, *et. al* 1971), (Gyang *et. al* 1992). The sciatic nerve also innervates major muscles of the hindlimbs; obturator internus, gemilus, quadriceps femoris, semitendinosus and semimembranosus (Fradson, 1974, Cox, *et. al*, 1975). Hamberger (1955) reports that in numerous investigations of reflexes and other problems of neurophysiology involving transaction of the central nervous system of adult birds, regeneration and restoration of functional activity has never been observed. Complete

restoration after resection of the spinal cord occurred only in chick embryos after 2 - 5 days of incubation (Clear, 1954). Tencate (1960) made microscopical preparation of the spinal cord of adult pigeons to establish the anatomical alterations and the place of transaction. A regeneration of the whole spinal cord was not observed but some growth of the nerve fibres in the proximal as well as the distal part of the spinal cord was found.

A number of conditions affects sciatic nerve to present lameness or total paralysis in chickens. Some of these conditions include nutrition as in arachidonic acid deficiency (Roland, 1979), traumatic injuries to the pelvis (Guth 1956, Vaughan, 1964) and fracture of the femour (Ayorinde, 1988 unpublished information). However, the

paralysis that may be observed in these cases may not be as complete as that which would be observed in chicken which has its sciatic nerves neurectomised and may therefore all depend on the severity of the disease condition as well as the strain of bird affected (Ayorinde, 1988). This study was therefore designed to guide clinicians in prompt and accurate diagnosis of sciatic nerve surgical problems in chickens and wild, game birds for better a management of the condition.

Materials And Methods

Animals

Six Nigerian local cocks were purchased from Sokoto Central Market for the study. They were eighteen weeks old and weighed between 1.0 to 1.5kg. None had any history of previous vaccination. The cocks were conditioned for 14 days and fed on corn, and chick mash. Tap water was provided ad libitum. Prior to the experiment the birds were assessed to be in good health based on the results of physical and clinical examinations. Laboratory examination ruled out possible microbes and other helminth eggs or ova. The birds were divided into three groups: Group 1 consisted of two chickens for unilateral neurectomy Group 2 consisted of two chickens for bilateral neurectomy and Group 3 consisted of two chickens as controls.

Anaesthesia

Ring block technique of infiltration with 2% lidocain HCl at proximal one third portion of the thigh region were performed on each operated chicken.

Operative Procedure

The lateral aspect of the thigh was prepared aseptically after plucking off the feathers from the dorsal ilium to the proximal end of the tibia. The details of surgical procedure is the same as described by Yasuad (1961), Cox *et. al.* (1975), and Gyang *et. al.* (1992) except after blunt dissection technique the nerve was exposed cranially to the bifurcation of the sciatic nerve into tibial fibular nerve and about 0.3cm of the nerve trunk removed. The muscles were opposed with simple interrupted sutures using 1 – 0 chromic catgut and skin incision suture with silk also in simple interrupted suture pattern. Post operative care consisted of systemic antibiotic procaine penicillin 400,000 I.U. intramuscularly daily for four days.

Results

In unilateral sciatic nerve neurectomy (Fig. 1) the chicken stood on one leg with the affected leg hanging loosely. The stifle and fetlock joints were flexed. While walking, the affected leg was dragged on the limb to become bruised with time. There was loss of skin sensation on the lateral aspects except on the medial aspects of the affected thigh. The digits of the affected limb were curled caudally. In an attempt to stand up, the bird rather circled. The circling was in the direction of the neurectomised limb.

In the bilateral sciatic nerve neurectomy (Fig.1) the bird sat on its hocks on the ground. The legs became abducted in an attempt to move and the wings spread out on the ground to provide additional support to the bird. Throughout the period of observation, appetite appeared not affected as the birds continued to eat normally. The birds also defecated normally.

Discussion

The sciatic and obturator nerves are frequently implicated in lameness and paralysis of the hindlimbs of farm animals (Cox, *et. al.*, 1973; Gyang, *et. al.* 1992). Vaughan (1964) reported loss of skin sensation of almost the entire limb except on the medial aspect of the limb of cattle. This observations are similar to those observed in chickens in this study.

In the bilateral sciatic nerve neurectomy the bird assumed a sitting posture on the hock with its vent on the ground. This could be explained by the loss of gripping ability of the digits caused by the paralysis of the innervating nerves. Some of the muscles innervated are gemilus, quadriceps femoris, semitendinosus, semimembranosus and obturator internus. In both unilateral and bilateral sciatic neurectomy although lameness was very poor, the animal could still move about by dragging the affected limbs on the floor in search of food. The circling movement observed in this study can be attributed to exaggerated action of gluteus medius, gluteus profundus, gluteobiceps and gemili muscles that would tend to rotate the femur laterally in the absence of adequate compensatory action from the nerve (Gyang *et. al.*, 1992). Bilateral sciatic nerve neurectomy in birds is more incapacitating and should be considered more serious when evaluating clinical cases. Any injury of sciatic nerve may be associated with lameness and paralysis of the affected limbs in chickens.

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Fig. 1: Paralysis of one or two limbs of contaminated chicks

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Fig. 1: Paralysis of one or two limbs of neurectomised Chickens

The present study was conducted with a view to determine the effect of neurectomy on the locomotor movements of the pigeon. The results of the present study are in accordance with those reported by Tanaka (1980) who reported that neurectomy of the spinal nerves of the pigeon resulted in paralysis of one or two limbs. Any injury of nerve may be associated with haemorrhage and swelling of the affected limbs in animals.

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