Case Study

Tibio-tarsal luxation and its surgical management in a German Shepherd dog

ANJU POONIA[1*], SULEKHA[1], AMIT KUMAR[1] and HITESH[2]

[1]Department of Veterinary Surgery and Radiology
[2]Department of Veterinary Gynaecology and Obstetrics
Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar 125001 Haryana, India
[*]Email for correspondence: anjupooniavs@gmail.com

 Received: 12.06.2023/Accepted: 23.07.2023

ABSTRACT

Joint luxation is a serious orthopaedic concern because of its potential damage to articular cartilages and ligaments. Joint arthrodesis using bone screws, bone plates or pins is considered as a final solution in the cases where luxations cannot be corrected. A one-year-old German Shepherd was diagnosed with right tibio-tarsal luxation after a motor vehicle accident. Under general anaesthesia, joint arthrodesis was performed using bone screws after reducing the bone in its anatomical position. Partial weight bearing lameness was reported one month postoperative.

Keywords: Arthrodesis; luxation; tibio-tarsal; screw

INTRODUCTION

In dogs, tibio-tarsal joint luxation or subluxation are mainly traumatic due to automobile accidents and are usually associated with malleolar fracture, collateral ligament rupture and tissue loss (Tobias and Johnston 2012). Ligament rupture and joint instability have been reported in 50 per cent of traumatic joint luxations (Rahal et al 2006). The primary aim of treatment is to restore the joint alignment and stability while supporting structures and articular cartilage surfaces heal (Bruce et al 2002). The arthrodesis of the tibio-tarsal joint, leaving it in a functional position, is considered a final solution for trauma cases with no repair of ligament injuries, luxations without possibility of joint recovery and chronic joint diseases (Roch et al 2008).

Accident case of a German Shepherd dog

A one-year-old male German Shepherd was brought to veterinary clinical complex with the complaint of non-weight bearing lameness of right hind limb after a motor vehicle accident two days before. Physical examination of right hind limb revealed an open wound and increased range of motion of the hock joint suggesting joint luxation which was confirmed by radiographic examination that revealed luxation of tibia from the tarsal joint at acute angle (Plate 1). Thus the case was diagnosed as tibio-tarsal joint luxation and haematological parameters were within the normal clinical limits and thus surgical intervention was performed to correct the joint luxation.

The dog was fasted 12 hours prior to preparing for aseptic surgery. It was premedicated with subcutaneous atropine sulphate injection @ 0.04 mg per kg body weight followed by sedation with intramuscular xylazine hydrochloride injection @ 1 mg per kg body weight. Anaesthesia was induced with intramuscular ketamine hydrochloride injection @ 5 mg per kg body weight and maintained on xylazine-ketamine combination intravenously. The dog was restrained in right lateral recumbency and the hock joint was approached medially. The hock joint was explored and it was observed that there was serious damage to the lateral and medial collateral ligaments. Thus it was decided to perform joint arthrodesis.

The tibia was relocated back to its anatomical position with a joint angle of 125-135 degrees. A cortical screw was passed through the distal tibia into the tuber calcaneous bone to fix the joint (Plate 2).

Plate 1. Radiographic image showing luxation of tibia from tibial tarsal

Plate 2. C-Arm intensifier image after tibio-tarsal joint arthrodesis

The muscles and skin were closed as per standard procedure.

Postoperatively antibiotics and analgesics were administered for five days parenterally. External immobilization of the joint was performed with PVC pipe splint. Complete cage and movement restriction was advised for a period of one month. Further postoperative evaluation was made telephonically where the owner reported partial weight bearing lameness of the dog one month postoperative.

Shearing injury of the canine hock joint most commonly results in the loss of the medial malleolus of the tibia and the rupture of the medial collateral ligament resulting in joint instability and disarticulation (Ayyappan et al 2011).

Tibio-tarsal luxation involves the luxation of tibia from the trochlea of the tibial tarsal along with rupture of the supporting ligaments leading to joint instability. Screws are often used in medium and large breed dogs while kirschner pins are preferred in small breed dogs and cats for joint arthrodesis (Serrano-Crehuet et al 2022).

Regardless of the stabilization method used, the basic principles of joint arthrodesis should be applied such as total removal of all the articular cartilages, adequate contact between the ends of the bone and rigid fixation (Theoret and Moens 2007). During the immobilization period, external coaptation consisting of a bandage, splint, sling or rigid fixator is typically used to fix the joint in a position that minimizes the risk of relaxation (Ayyappan et al 2011).

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