

**.Sudan University of Science and Technology
College of Graduate Studies**

Application of Conventional Radiography
for Canine Locomotor System with Special
Emphasis on Bony Pelvis, Pelvic limb and
Hip Dysplasia

**تطبيقات الأشعة التقليدية في تصوير
الجهاز الحركي للكلاب بالتركيز علي الحوض
العظمي ، الأطراف الخلفية وانزلاق مفصل
الحوض**

Thesis Submitted in Fulfillment of the Requirement for the Degree of
Doctor of Philosophy (Ph.D) in Diagnostic Radiographic Technology

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Dedication

To my Father

To my Husband

To my sons

To my Brothers

To my Daughters

To my sisters

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ملخص الدراسة

أجريت هذه الدراسة في الأشعة بأدارة الكلاب البوليسية الذي يتبع لوزارة الداخلية. كلاب الراعي الألماني هي الأكثر إختياراً للعمل الشرطي وخصوصاً في متابعة الأثر والجرائم والبحث عن المخدرات. وقد استخدمت ثلاثون كلباً منهم (24) راعي ألماني من بينهم (16) أنثى و(8) ذكور و(6) كلاب الأخرى كانت من الفصيلة المحلية. قامت الدراسة بأخذ بيانات عن العمر، الوزن، وأخرى.

استخدمت في الدراسة جهاز أشعة موباييل ماركة (سيمانس) للفحوصات الإشعاعية أما الفحوصات المعملية فقد أجريت في وحدة البحوث المعملية بمستشفى الخرطوم التعليمي. أجري الفحص المعملى لستة كلاب ثلاثة منهم مصابة بإنزلاق وإتهاب مفصل الحوض والثلاثة الأخرى استعملت للمقارنة.

الغرض من هذه الدراسة انشاء استراتيجية للتكاثر بدون الإنزلاق الغضروفي بمفصل الحوض، إيجاد وضع جديد لتصوير انزلاق مفصل الحوض، تكوين اطلس تشريح إشعاعي لكلاب الراعي الألماني، قياس التغيرات في الدم والتغيرات الكيميائية نتيجة مضاعفات انزلاق مفصل الحوض.

تم تصوير الحوض والأطراف الخلفية بأوضاع معدلة وذلك بإيجاد أوضاع تصوير جديدة، أيضاً قامت الدراسة بإجراء فحص للدم وللأنسجة والتصوير بالأشعة المقطعية لكلبة مصابه بالإنزلاق وخشونة مفصل الحوض.

خلصت الدراسة الي أن الوضع الظهري البطني (Dorso Ventral) هو الأمثل لتصوير انزلاق مفصل الحوض والأطراف الخلفية، أما الوضع البطني الظهري dorsoal - Ventro مع تحريك الأطراف الخلفية نحو الداخل (VD2) هو الأمثل لتصوير المدور الصغير Lesser Trochantor. كما شملت الدراسة إيجاد معادلات عوامل التعريض بمعرفة الوزن فقط

Abstract

The study was conducted at X-ray department in Police Dogs Administration (Ministry of Interior).

German Shepherds are a very popular selection for use as working dogs. They are especially well known for their police work, being used for tracking criminals, patrolling troubled areas, and detection and holding of suspects.

Thirty dogs of two breeds were put under investigations. 24 dogs were German shepherd (8 males and 16 females) and-the remaining six were males of local breed type. Their demographic data were obtained (age, weight . . . etc). A Poly mobile Siemens X-ray Machine was used. The clinical investigations were conducted in Laboratory Unit in Khartoum Teaching Hospital. Six German shepherd dogs were examined, three dogs diagnosed radiographically for hip dysplasia and osteoarthritis, while the other three dogs were examined as control group.

The objectives of this study were to: develop breeding strategies to reduce the incidence of canine hip dysplasia, asses the standard traditional radiographic technique of canine pelvis and then to develop a new radiographic technique for hip dysplasia. Finally to assess the haematologic and chemical findings due to hip dysplasia complications.

Pelvic and hind limb radiography was carried out with modification in order to obtain a new technique for hip dysphasia and pelvic limb, on the other hand, laboratory tests were done for six German-shepherd dogs.

Histopathology and CT were done for one of the affected sample which had dysplastic hip and osteoarthritis. The result of this study showed that; the Dorso — Ventral flexed legs in best for visualization of the hip dysphasia and hind limb (femurs, tibiae and fibulae). Ventro-dorsal external rotation is best for demonstration of the lesser trochantor. Lateral view for tibiae, fibulae, tarsus, metatarsus and phalanges were obtained.

An equation was developed for the kV; mAs exposure factors parameters using body weight.

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List of Appreviation

GSD	German shepered Doges
DV	Dorso-Ventral Project
VD	Ventro-Dorsal Projection
DLS	Dorso Lateral Sublaxation
CT	Computed Tomography
ICRU	International commission or Radiation Units
NCRP	National Council of Radiation Protection
NRPB	National radio logical protection Board
NHMRC	National health medical Research council
USG	Ultra Sonography Imaging
MRI	Magnetic Resonance Imaging
DSA	Digital Subtraction Angiography
IITV	Image Intensifire T.V
ICRP	Internation Commission on Radiological Protection
CSR	Chronic Superficial Keratitis
CHD	Canine Hip dysplasia
DI	Distraction Index
DJD	Degenerative Joint Disease
OFA	Orthopedic Foundation for Animal
KV	Kilo Voltage

mAs	Mili Amparage Second
FFD	Focal Film Distance
NA	Norberg Angle
WBC	White Blood Count
RBC	Red Blood Count
EDTA	Ethylene Diamine Tetra-acetic Acid
DQC	Daily Quality Control
GOT	Glutamic Oxaloacetic Transaminase