DIAGNOSIS OF THE HIP DYSPLASIA IN THE CANINE SPECIES

MAR VALLÈS BARBERÀ
Final Degree Project - June 2019

UAB Universitat Autònoma de Barcelona

FACULTAT DE VETERINÀRIA

INTRODUCTION

OBJECTIVES

- **Bibliographic review** and **synthesis** of the main aspects related to hip dysplasia in canine species
- **Description** of disease-causing factors, affecting joints and clinical of pathology
- **Summarize** the main **diagnostic techniques** based on physical examination and radiographic techniques.
- A **comparison** between the different detection methods and their effectiveness

DEFINITION

Non-congenital hereditary disease caused by inflammation in the coxofemoral joint, it has a high prevalence large and giant breeds of dog.

HIP DYSPLASIA

Figure 1: The right hip is normal whereas the left hip has dysplasia

CAUSES

Genetic factors + Phenotypic factors
- Food   - Fast development
- Weight   - Over exertion

DEVELOPMENT OF HIP
- 30 days: ↑ volume of the ligament of the femoral head and ↑ synovial fluid volume
- 7 weeks: Subluxation of the femoral head
- 2-3 months: Increased degree of subluxation

JOINT LAXITY

Functional laxity: is the pathologic form of laxity which, occurs when the dog is weight-bearing. Can not be measured.

Passive laxity: Measured from x-rays in dogs without pain under sedation / anaesthesia. Different measuring parameters:
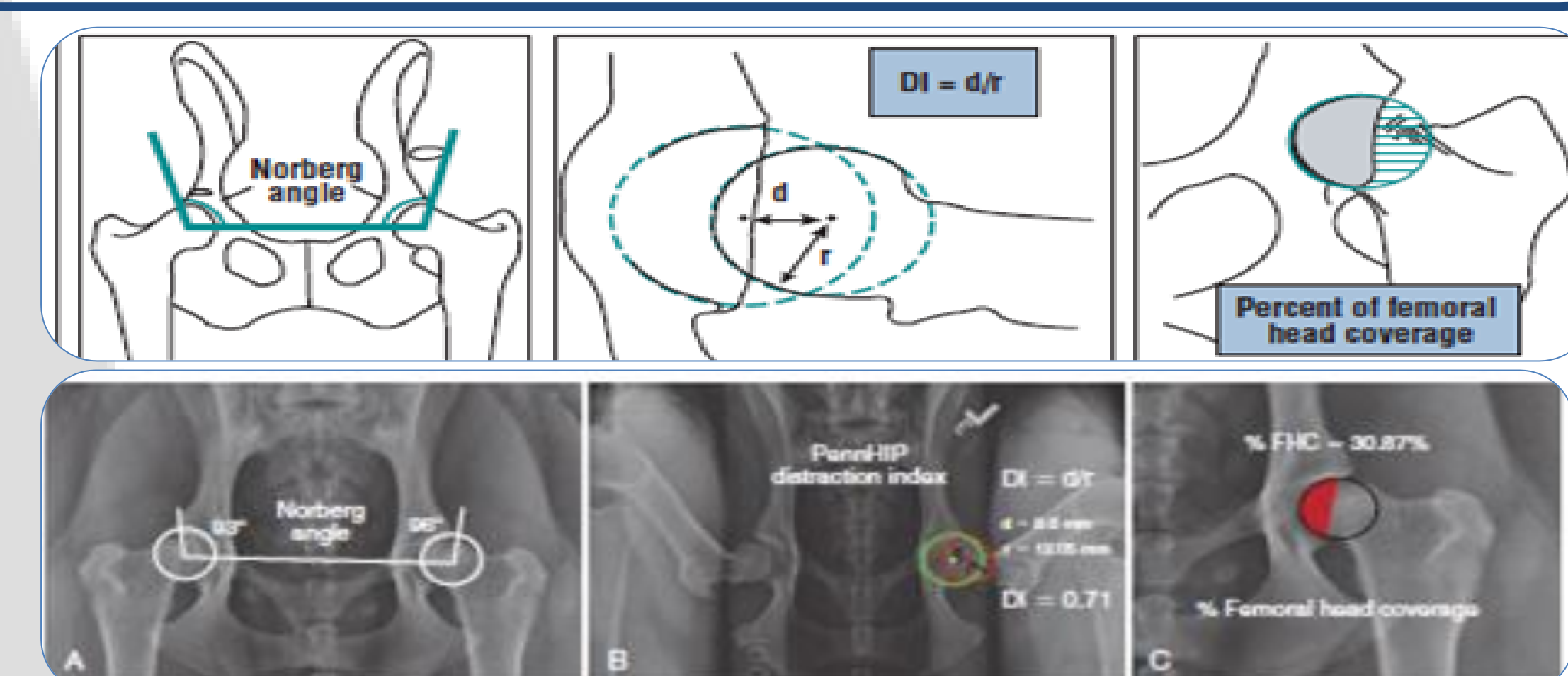

Figure 2 and 3: Norberg angle, index distraction (PennHIP) and percent of femoral head coverage

DIAGNOSIS

CLINICAL SIGNS

Puppies (5-12 months)	Adults (More than 1 year)
• Inflammation and stretching of the joint capsule, ligaments and muscles. • Waist instability with overload joint areas causing acetabular microfractures → PAIN.	• Inflammation of the joint capsule that induces a laxity of the joint resulting in periarticular fibrosis. • Fibrosis helps stabilize the joint.

- Unilateral or bilateral hind limb lameness
- Difficulty a rising after rest, reluctance to walk, run, jump or climb stairs
- Exercise intolerance   - Pain/soreness of the hind limbs

PHYSICAL EXAMINATION

It is done in order to discover if clinical signs are due to the hip dysplasia or other pathologies. The different methods are the Ortolani test, the Barden test and the Barlow test.
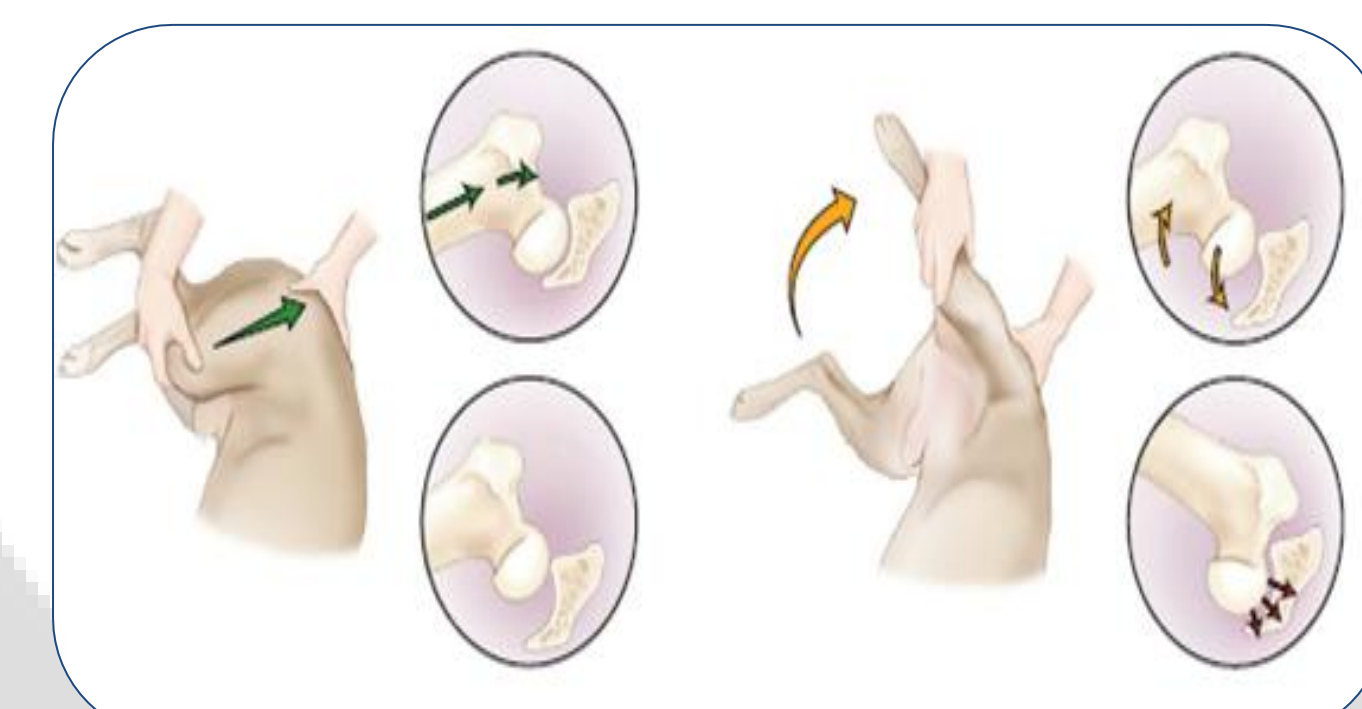

Figure 4: Ortolani test

OFA (Orthopedic Foundation for Animals): Classifies hip dysplasia into categories: Excellent to severe.
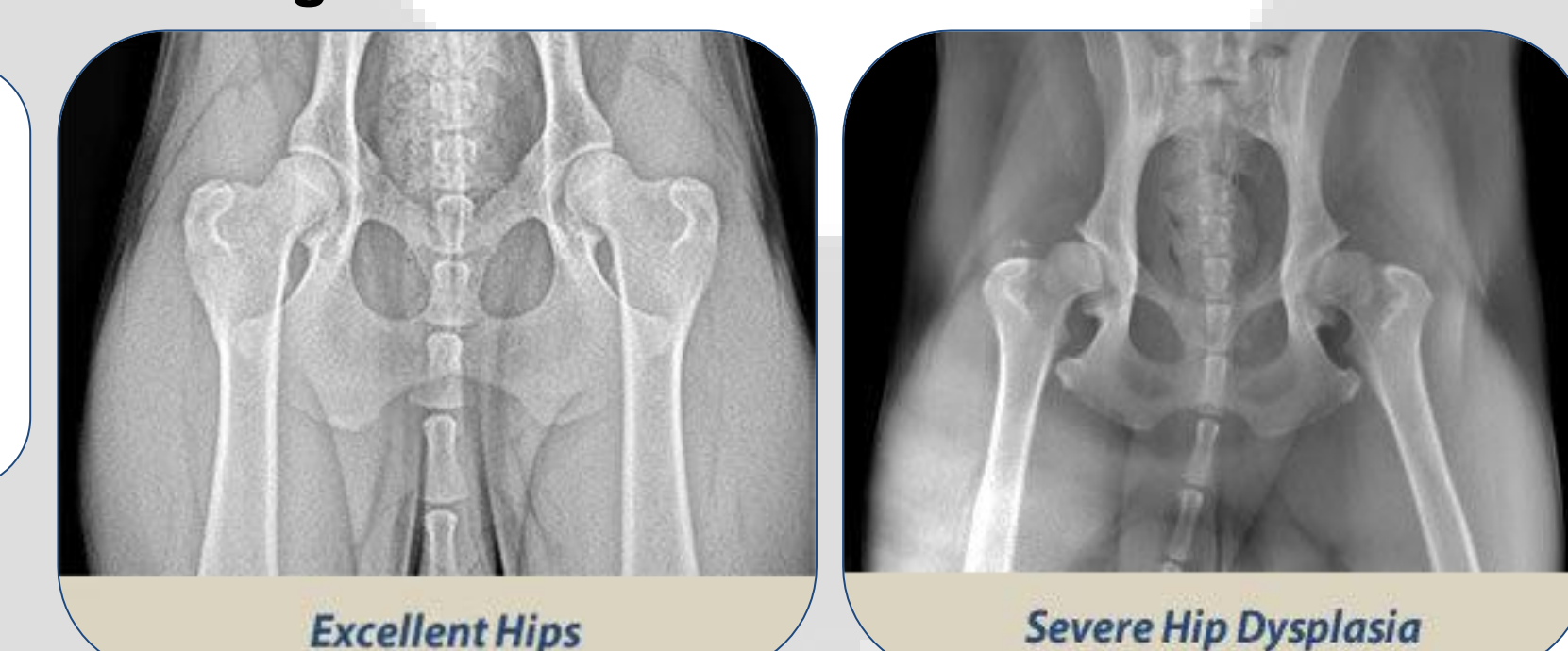

Excellent Hips / Severe Hip Dysplasia

Figure 5 and 6: OFA x-rays

FCI (Federation Cynologique International): Classifies hip dysplasia in categories: A (no signs) to E (severe).

Figure 7: FCI x-rays

BVA/KC (British Veterinary Association / Kennel Club): The hip joint is classified according to the severity of the changes in 9 specific morphological criteria. Each criterion is rated form 0 (ideal) to 6 (worst).

X-RAYS

This is the main diagnostic technique for detecting hip dysplasia. Performed under anesthesia or intense sedation because it facilitates a precise position and reduces the need for repetition. The position of the animal is ventrodorsal.
Recently, three radiographic characteristics are now considered to be significant clinical signs → caudolateral curvilinear osteophyte (CCO), circumferential femoral head osteophyte (CFHO) and "line of the puppy".
There are three organisations in the world which have different scoring methods:

GENETIC

The main objective of these genetic studies is selective breeding to improve the reproduction of the good genes in the mating process, based on the evaluation of the phenotype, excluding environmental factors.
Study of the genome → in several races 6 nucleotides associated with hip dysplasia and osteoarthritis → Creation of the predictive model → Identification of 7 SNPs associated with the disease.

CONCLUSIONS

- Hip dysplasia is a **relatively frequent disease** in large and giant breeds with a **multifactorial origin.**
- The correct **knowledge** of the disease **allows** us **to perform early diagnoses** to detect the animals that suffer from the disease and also those who have not yet being diagnosed with degenerative lesions.
- There are **different diagnostic methods** whose results are **similar** and **comparable** to each other. The **clinical technique** of **PennHip** is **the most sensitivity** and **informative** method.
- The **predictive model through genetics** is a **significant advance** in the early detection of hip dysplasia, to help choose the appropriate therapeutic once the genetic predisposition has been indentified.

REFERENCES

1. Tobias, K. M., & Johnston, S. A. (2012). *Veterinary surgery : small animal*. Elsevier. Pathogenesis, Diagnosis, and Control of Canine Hip Dysplasia. Musculoskeletal System (section IV), Chapter 59, pp 318-348.
2. Macías, C., Cook, J., Innes, J. La cadera. Manual de alteraciones musculoesqueléticas en pequeños animales. España, 2010. Capítulo 21, pp 415 – 427.
3. Flückiger, M. (2007). Scoring radiographs for canine Hip Dysplasia - The big three organisations in the world. European Journal of Companion Animal Pratice, 17(2), 135–140.
4. Bartolomé, N., Segarra, S., Artieda, M., Francino, O., Sánchez, E., Szczypiorska, M., Casellas, J., Tejedor, D., Cerdeira, J., Martínez, A., Velasco, A., Sánchez, A (2015). A genetic predictive model for canine hip dysplasia: integration of Genome Wide Association Study (GWAS) and candidate gene approaches.