UNIVERSITEIT GENT

FACULTY OF **VETERINARY MEDICINE**
approved by EAEVE

Arthroscopic findings in 32 joints affected by severe elbow incongruity

Y. Samoy, D. Van Vynckt, H. Seghers, K. Vermote, E. de Bakker, I. Gielen, H. van Bree, B. Van Ryssen

Department of Veterinary Medical Imaging and Small Animal Orthopaedics, Faculty of Veterinary Medicine, Ghent University, Belgium

Introduction:

Elbow incongruity is most frequently described as the absence of a parallel joint space, resulting in a step between the radius and the ulna[1]. It is part of the elbow dysplasia complex [2] 2and is believed to play a role in the development of a fragmented medial coronoid process (FCP). While the arthroscopic measurement of radio-ulnar incongruity has been evaluated in an in vitro study and proved to be a reliable technique for this purpose [3],the typical arthroscopic findings in clinical cases of severe incongruity have not been described.

Aim:

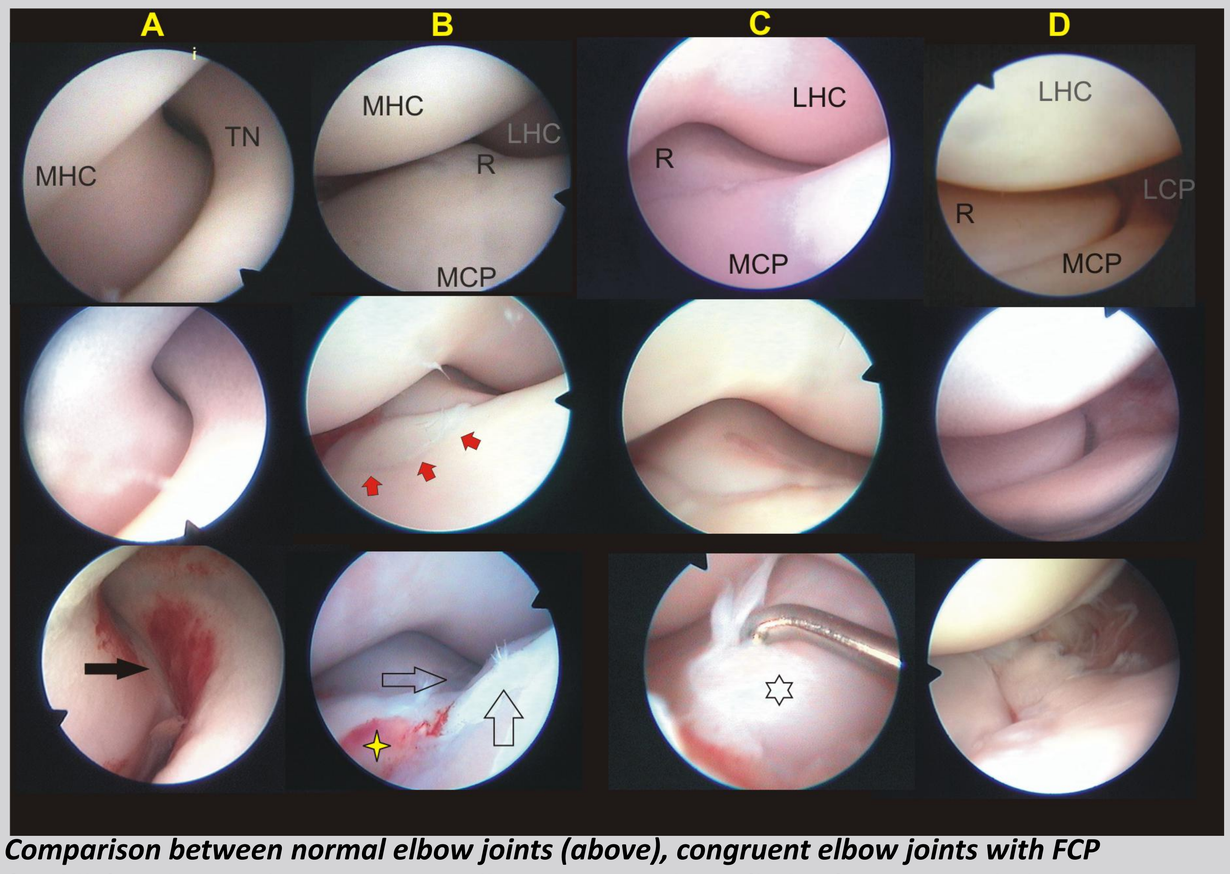
To describe the typical arthroscopic findings in elbow joints with severe incongruity by comparing them to normal joints and joints affected with FCP without an obvious incongruity.

Materials and Methods:

In a retrospective study data of three groups of dogs were analyzed. Arthroscopy of the examined joints was performed under general anesthesia via a medial approach with a 2.4-mm, 25° oblique arthroscope (Richard Wolf GmbH Knittlingen, Germany) [4]. Different regions of the elbow joint were inspected.

Group 1: This group was used as a reference for normal findings and consisted of 10 joints of 5 healthy purpose bred dogs, with a mean age of 42 months (11-96 months).
Group 2: This group was used as a reference for congruent joints affected by FCP [5,6] and consisted out of 32 joints of 21 lame dogs with a mean age of 15 months (7-23 m). Twelve dogs were Labrador Retrievers, 3 were Rottweilers, and 3 were Bernese Mountain Dogs. The others were a Fox Terrier, a Boxer and a Staffordshire Terrier.
Group 3: This group was the target group and consisted out of 32 severely incongruent joints of 19 lame dogs with a mean age of 11 months (5-24m). Seventeen dogs were Bernese Mountain Dogs; the other 2 were Labrador Retrievers. There were 14 male and 5 female dogs.

Results:



Comparison between normal elbow joints (above), congruent elbow joints with FCP (middle) and severely incongruent elbow joints with FCP(below). Drawings below indicate the localization of the arthroscopic images.
Colum A shows the appearance of the trochlear notch. The black arrow indicates an irregular notch with abnormal tissue.
Colum B shows the condition of the medial coronoid process and the medial radio-ulnar transition. On the upper image, no abnormalities are visible. A fissure line is present on the middle image (red arrows) with a smooth radio-ulnar transition. The lower image shows a step (horizontal transparent arrow), irregular delineation of the radio-ulnar transition (vertical grey arrow) and a large displaced fragment (yellow star).
Colum C demonstrates the irregular tissue of the radial head in severely incongruent elbow joints (asterisk), which is absent in the other joints.
Colum D shows the lateral view of the radio-ulnar transition. While the upper and middle images show a smooth transition, the lower (incongruent) joint has an irregular transition.
MHC = medial humeral condyle, LHC = lateral humeral condyle, R = radial head, MCP = medial coronoid process, LCP = lateral coronoid process.

		Normal joints	Congruent FCP joints	Incongruent FCP joints
Observations	**Pathology**			
Radio-Ulnar transition	Step	**0%** (0/10)	**0%** (0/32)	**100%** (32/32)
	Irregular	**0%** (0/10)	**6%** (2/32)	**88%** (28/32)
Humero-Radial joint space	Enlarged	**0%** (0/10)	**0%** (0/32)	**100%** (32/32)
Humero-Ulnar joint space	Enlarged	**NA**	**NA**	**NA**
Radial Head	Irregular surface of the radial head	**0%** (0/10)	**0%** (0/32)	**69%** (22/32)
Trochlear Notch	Irregular cartilage	**0%** (0/10)	**0%** (0/32)	**72%** (23/32)
Additional findings				
Fragmentation of the medial coronoid process	Fissure	**0%** (0/10)	**50%** (16/32)	**28%** **(9/32)**
	Fragment	**0%** (0/10)	**44%** (14/32)	**0%** (0/32)
	Displaced fragment	**0%** (0/10)	**6%** (2/32)	**72%** (23/32)
Cartilage lesions				
Medial Coronoid Process	Cartilage lesions (total number)	**0%** (0/10)	**16%** (5/32)	**75%** (24/32)
	Grade 2	**0%**	**60%** (3/5)	**58%** (14/24)
	Grade 3 - 4	**0%**	**40%** (2/5)	**42%** (10/24)
Medial Humeral Condyle	cartilage lesions (total number)	**0%** (0/10)	**22%** (7/32)	**84%** (27/32)
	Grade 2	**0%**	**57%** (4/7)	**30%** (8/27)
	Grade 3 - 4	**0%**	**43%** (3/7)	**70%** (19/27)

Arthroscopic findings in normal, congruent and severely incongruent joints with FCP. Grading of the cartilage lesions is done using the modified Outerbridge Classification.

Conclusion:

Arthroscopy allowed the detection of several features as a sign or as a consequence of severe elbow incongruity or the accompanying inflammation. These findings were not seen in normal joints and exceptionally in congruent joints with FCP. These changes not only help in diagnosing elbow incongruity, but may also be used to determine parameters that enable a reliable grading of incongruity in clinically dysplastic joints.

References

1. Samoy Y, Van Ryssen B, Gielen I, et al: Review of the literature: elbow incongruity in the dog. Vet Comp Orthop Traumatol 19:1-8, 2006.
2. Blond L, Dupuis J, Beauregard G, et al: Sensitivity and specificity of radiographic detection of canine elbow incongruence in an in vitro model. Vet Radiol Ultrasound 46:210-216, 2005.
3. Wagner K, Griffon DJ, Thomas MW, et al: Radiographic, computed tomographic, and arthroscopic evaluation of experimental radio-ulnar incongruence in the dog. Vet Surg 36:691-698, 2007.
4. Van Ryssen B, van Bree H: Arthroscopic findings in 100 dogs with elbow lameness. Vet Rec 140:360-362, 1997.
5. De Rycke LM, Gielen IM, Van BH, et al: Computed tomography of the elbow joint in clinically normal dogs. Am J Vet Res 63:1400-1407, 2002.
6. Wind AP: Elbow incongruity and developmental elbow diseases in the dog: Part I. J Am Anim Hosp Assoc 22:712-724, 1986.