

# Golden retriever Ectopic Ureter Project - Update

‘Wet Puppy Syndrome’



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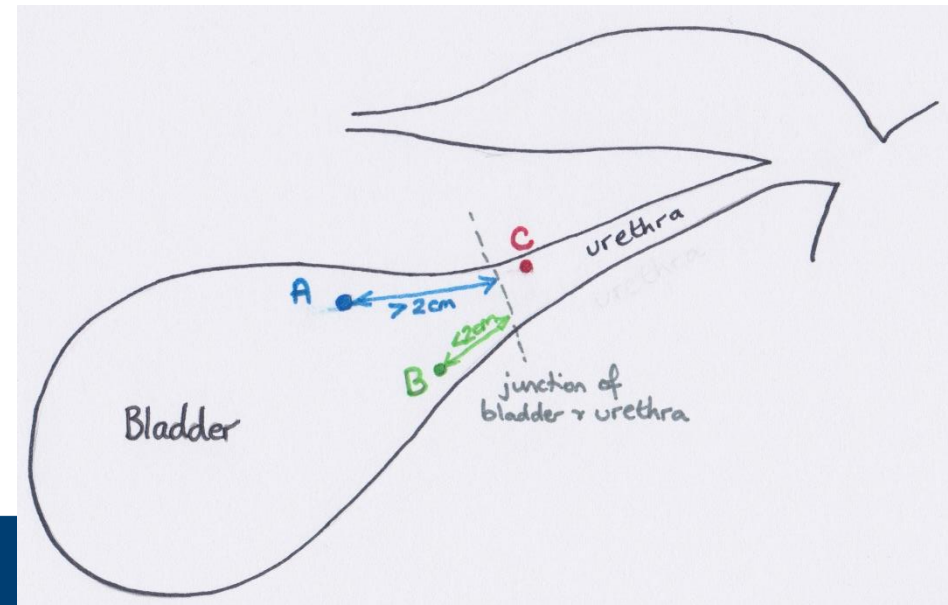
# Background

- In Entlebucher mountain dogs researchers have identified 3 subtypes of ureter position in healthy, clinically unaffected dogs:

A = normal

B = intermediate ( e.g. enters into the bladder but near to bladder neck)

C = ectopic (abnormal)

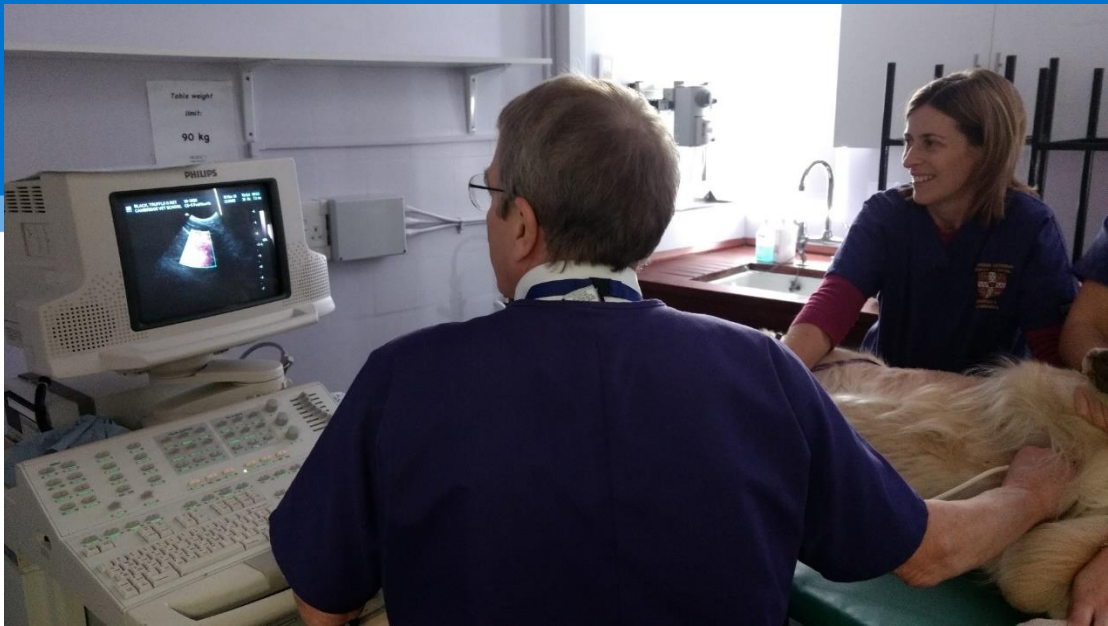


# Background

- Use of an ultrasound screening test to avoid breeding with any 'C' type dogs and to reduce the number of 'B' types used has reduced the number of 'wet puppies' by 20-30% over the last 3-4 years.
- Questions we wanted to answer with this project:
  - **Do some healthy Golden retrievers have abnormal ureter positions?**
  - **Are males and females equally affected?**
  - **Could ultrasound screening be a useful pre-mating test in the Golden retriever?**
  - Could this help with development of a DNA test?

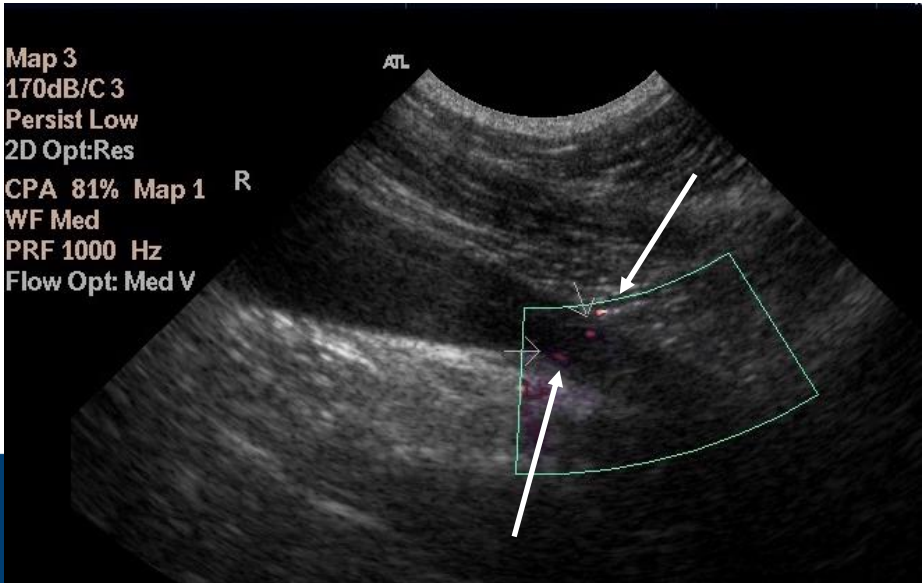
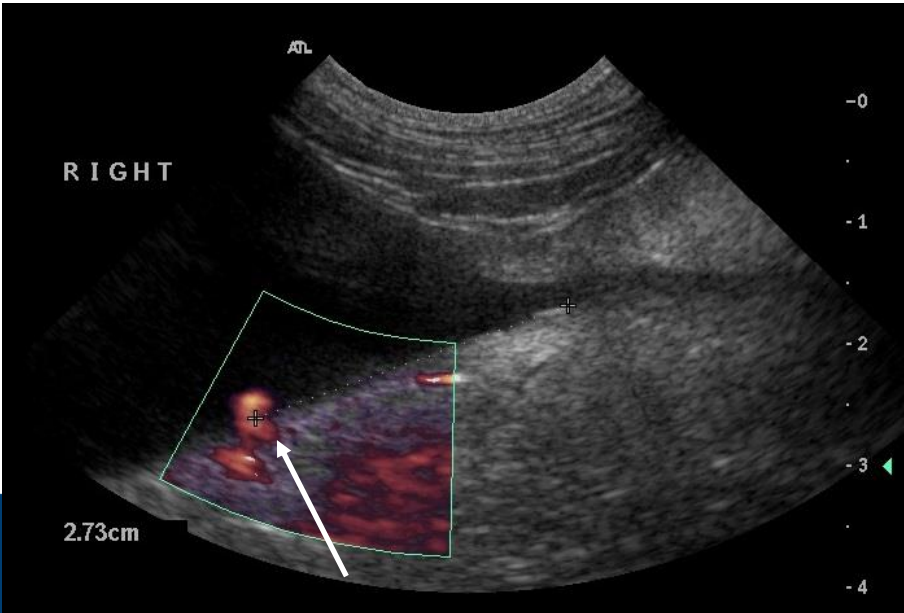
# The Project

- Volunteer healthy Golden retrievers, with no history of urinary incontinence were ultrasound scanned at the University of Cambridge by Professor Mike Herrtage.
- Dogs were predominantly living in the South East of England, but some were recruited from the Midlands and Lincolnshire
- The entry points of both ureters were scored as A, B or C based on the distance from the bladder neck, with C = ectopic ureter
- A vaginal examination was performed
- DNA swabs were taken for analysis at a later date



Type 'A' ureter

Type 'C' (ectopic) ureters





# Results Ultrasound Screening

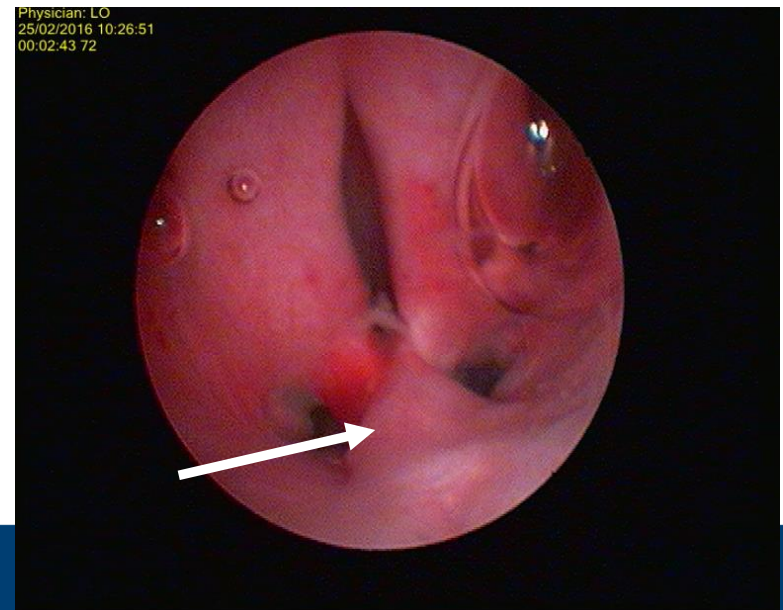
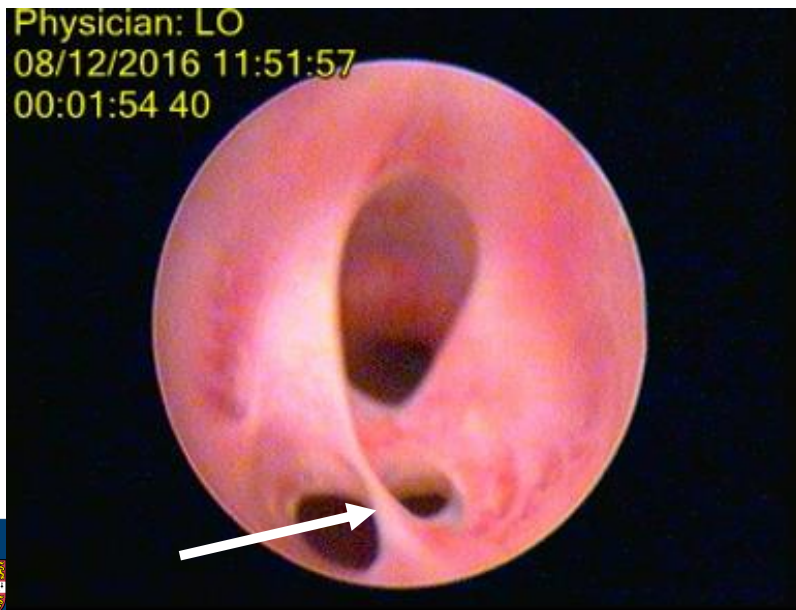
| Total 47 dogs                         | Male     | Female   |
|---------------------------------------|----------|----------|
|                                       | 15       | 32       |
| Double A                              | 11 (73%) | 21 (64%) |
| At least 1 Type B                     | 2        | 9        |
| At least 1 Type C<br>(ectopic) ureter | 2 (13%)  | 2 (6%)   |

Overall 8.5% of normal dogs had unknown ectopic ureters

# Vaginal Examination

- All 2 female dogs with ectopic ureters had a persistent vestibulovaginal band.
- None of the other female dogs had this

Examples from affected dogs having camera examination



# Conclusions so far.....

- Ectopic ureters DO exist in clinically normal Golden retrievers
  - 8.5% overall
  - Slightly higher incidence in males
- A vaginal band appears to be highly associated with ectopic ureters in females
  - This is also noted in clinical ectopic ureter cases



# What else have we learnt?

- Inheritance of this condition in Golden retrievers is complicated
  - This has already been shown in the Entlebucher where removing ectopic dogs from the breeding pool reduces, but DOES NOT ELIMINATE wet puppies.
  - We also know that breeding a dog with ectopic ureters DOES NOT DEFINITELY produce clinical puppies with ectopic ureters in every litter.
  - Unaffected litters MAY HAVE dogs with ectopic ureters, but NO clinical signs, especially males

# Future Directions

- DNA analysis of the samples collected
  - Consultation with Catheryn Mellersh AHT
- Extending the screening project to other geographical areas?
- Attempt to screen all direct relatives from an affected family to try to understand the inheritance better?
- Extend research into vaginal abnormalities in bitches presenting for mating?
  - Differentiate between a narrow vagina, a persistent hymen and a true vaginal band

# Future breeding recommendations?

- The number of breeding Golden retrievers is high, thus recommendations need to be manageable, especially in light of other breed tests
  - Possibilities:
    - DNA test becomes available – all dogs are screened?
    - Ultrasound screening continued for males only?
    - Females with abnormal vaginal anatomy or difficulty mating are screened prior to completion of mating?

**Many Many Thanks to  
all of our Volunteers  
- Human & Canine!!**