Muscle Biopsy Procedure

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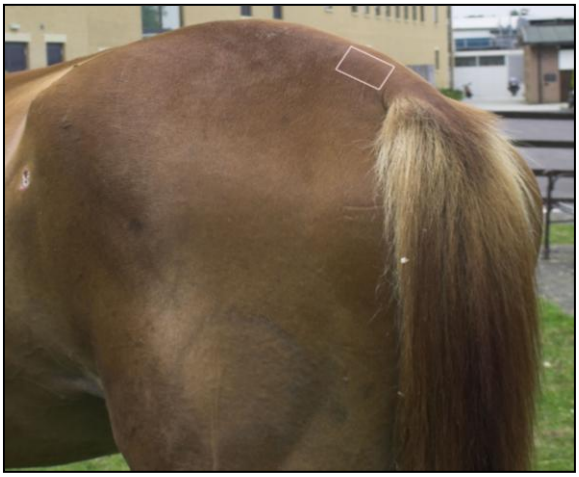
Indications / possible diagnoses

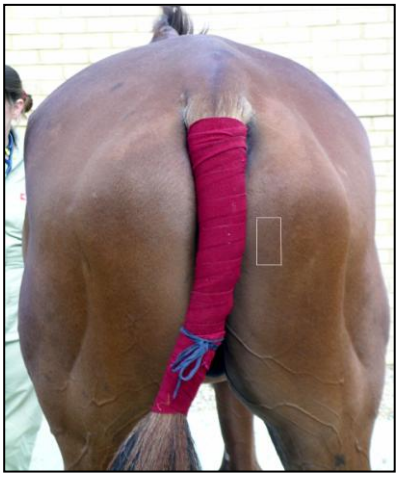
Exertional myopathies (RER/PSSM etc)
Equine Motor Neuron disease
Poor performance / elevated CK/AST
Unexplained muscle atrophy
Inflammatory / immune myositis
Myotonic dystrophy
Mitochondrial myopathy
Atypical myoglobinuria / myopathy
Sarcocystis myositis

Materials required

Drugs for sedation
Lignocaine 2% injection
Sterile gloves
Scalpel
Forcep
Small Gelpi retractor
Needle holders
Suture material / staples
Chilled 0.9% sterile saline
Sterile gauze swabs
Screw top container x2
10% formalin (10-20 ml)
Ice packs
Polystyrene box
Card and pins



Biopsy site for sacrocaudalis dorsalis medialis muscle in suspected EMND



Biopsy site for semimembranosus muscle in suspected exertional myopathies

Muscle Biopsy Method

1. Contact the laboratory and organise same day or overnight courier service prior to sampling. Avoid shipping over the weekend.
2. For horses with exertional myopathies the semimembranosis is generally chosen; for equine motor neuron disease, biopsy the sacrocaudalis dorsalis (craniolateral to tail head). For other disorders, choose the site based on the most obviously affected muscle or biopsy several regions.
3. Sedate horse and prepare skin for sterile surgery.
4. A Bergstrom biopsy needle is suitable, but reliable (and usually better) results are obtained with open biopsy.
5. Inject subcutaneously up to 10 ml of local anaesthetic, taking care to avoid direct injection into the muscle layer.
6. If you are working alone, wet several sterile gauzes with chilled sterile saline, squeeze them very tightly so they remain slightly damp but not wet, and lay them flat. If they are too wet, the sample is ruined. **If you have a non-sterile assistant, proceed with the next step.**
7. Make a 4cm incision (in the same orientation as the muscle fibres) in the skin and subcutaneous tissue, exposing the underlying muscle belly. Separate with Gelpi retractor.
8. Make 2 parallel incisions (3 cm) in the muscle parallel to the muscle fibres, about 1cm apart.
9. Then, while holding the incised muscle proximally, incise the proximal region and carefully undermine the strip (8mm depth). Finally incise distally. The muscle will contract as it is incised.
10. Carefully place the muscle sample on the damp gauze, and fold the top layer of gauze over it or if you have an assistant, pass the piece of muscle to them to refrigerate or place in a plastic pot in a cool box.
11. Close dead space completely and close subcutaneous layer. **Note: a thorough closure reduces chance of dehiscence.**
12. Suture or staple skin.
13. Divide muscle into 2 pieces. Pin one piece at either end onto card and place in 10% formalin in a screw top container. **There should be at least 20 x volume of formalin.**
14. Taking care not to compress the remaining sample, remove it from the gauze (if used), and place on the inside surface of a screwtop plastic container (on its own). DO NOT INCLUDE THE WET GAUZE AS THIS RUINS THE SAMPLE. Do not use pins for fresh sample.
15. Place both containers in a polystyrene box containing ice packs. Take care not to place the containers directly against the icepacks (the muscle itself must not freeze). Instead, provide some insulation (e.g. cotton wool).
16. We recommend submitting an EDTA and plain blood tube within the same package in case further testing is required. Note that the lab does not offer CK and AST testing.
17. Complete a submission form with the animal details and the tests required.
18. Seal and post the box by courier or hand deliver.
19. Results are generally available within 10-15 working days; if test results are required urgently for clinical reasons, please contact the laboratory and we will do our best to expedite the turn around.
20. AT ANY TIME PLEASE DO NOT HESITATE TO CONTACT THE LAB FOR FURTHER ADVICE, OR FOLLOWING RECEIPT OF THE RESULT.