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# A conservative treatment technique for gastrocnemius muscles rupture in young calves (7 cases)

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## INTRODUCTION

Gastrocnemius muscles rupture (GMR) and subsequent incompetence of caudal reciprocal apparatus is a serious injury rarely described in young calves that can occur during a fall with the hindlimb extended under the body, resulting in forced extension of the muscles while it is engaged in contraction. The consequence of the lesion is a severe lameness and occasionally the inability to weight bearing the affected leg, a severe dropped hock with excessive angulation at the hock joint and the stifle joint maintained in extension. Untreated animals usually have a poor prognosis because unable to self-repair the condition. These animals are frequently euthanatized in consequence of prolonged recumbency, severe sore lesions and degenerative myopathy. Surgical techniques to correct the caudal reciprocal apparatus rupture are rarely described in large animals. Some cases in foals had been managed successfully with temporary external skeletal fixation or a combination of splint-cast. The purpose of the present case report study is to assess the effectiveness of conservative treatment of GMR cases in young calves with a Thomas splint bandage to correct the condition.

## MATERIALS AND METHODS

All cases of GMR in young calves diagnosed between 2007-2010 were registered and analyzed retrospectively. Diagnosis of GMR was based on description of the referring veterinarian and on clinical observation of the calf at the time of admission or in the field. Only records of patients with complete follow-up and treated conservatively were selected. A recorded video tape of the patient was performed at the time of the admission or at the first clinical examination in the farm and repeated during the follow-up. The initial diagnosis of the referring veterinarian never considered the GMR as a differential diagnosis. Generally, suspicion of fracture or luxation was the reason for hospitalization. Diagnosis of GMR has been made on the basis of the clinical examination. An US examination completed the medical record in two animals. All the calves have been treated with a standard medical protocol. A short general anesthesia with propofol induction had to be performed in 2/7 patients. In the other 5 calves a sedation with xylazine was adequate to allow the manipulation. All the patients had been positioned in lateral recumbency with the affected leg uppermost. Affected limb was bandaged from the foot to the stifle with a uniform cotton roll layer. The immobilization was achieved with the stifle, hock and fetlock in a physiological weight bearing position, using the normal contro-lateral hindlimb as a reference, and the foot slightly flexed, bearing on the toe. The bandage was completed with a rounded aluminium splint that must be modelled directly on the shape of the leg, starting from the cranial aspect of the foot up to the stifle, then bending dorso-caudally to the line of the hip and then ventrally, following an inverse "U" shape, to continue on the caudal aspect of the leg. The aluminium splint was fixed to the limb using a self-adhering bandage (Self-Fix) wrapped in a double-8-figure around the splint dorsal and plantar to the leg. The bandages were protected with a self adhering tape (Vetrap). Using this technique the leg had been suspended by the splint in a not-weight bearing position with the gastrocnemius muscles relaxed, bearing on the toe of the foot and avoiding pressure contacts between the splint and the skin. During weight bearing the forces had been transferred from the splint to the tibia leaving the hock joint in a not-weight-bearing position. Initially, after recovery, the animals were assisted to help their hindlimb to protract during walk because the cranial phase of the stride of the affected limb is shortened by the weight of the bandage.

## RESULTS

During the observation time 7 medical records of calves with GMR were recorded. 5 animals were Piemontese calves and 2 animal were Belgian Blue. Heavy breeds were significantly more represented than other breeds. All cases observed were male and in 5/7 it was reported from the owner to be the heaviest newborn calves in the farm. All patients were 0-15 days old with a mean age at presentation of 3.8 day. In 4/7 patients a significant swollen leg had been observed at clinical presentation in the plantar aspect of the tibia that diminished after 5-8 day of therapy. Animal received 1.0 mg/kg of flunixin meglumine daily for 5 to 8 day after the trauma to control the pain. All bandages and splint had been well tolerated from the animals. All the

patients were able to stand up alone after the bandage had been positioned but all the animals needed to be assisted during the first walk after recovery. In 2/7 cases we treated animals 1d old still unable to walk. In 2/7 animals bandages were maintained 6 weeks, in the others subjects the immobilization protocol duration was 8 weeks. Calves had been managed in a single box and initially needed assistance by the owner during nursing. All the patients during the bandage period had been submitted to a controlled exercise programme. In none of the animal adverse effects related to the splinting technique were observed. Bandage were changed every three to four weeks and no more than two bandages had been required to obtain a clinical resolution of the condition. Weight bearing improved in all patient shortly after the bandage had been performed at the recovery from sedation/general anaesthesia. Complication recorded related to the procedure are pressure sores at the point of the hock, reported in 2 patients, and urine sore at the point of the hock and on the medial surface of the fetlock, described in 1 animal. A restricted range of motion of the hock joint after bandage removal was reported in 5/7 patients in which the bandage was maintained for 8 weeks. The bandages were removed after 6-8 weeks and no further support was necessary. All the treated animals showed a complete functional recovery of the hock joint and experienced unrestricted use of the hind limb after recovery for at least one year.

## CONCLUSION

GMR affects mainly young and newborn heavy animals in the farm after a traumatic event due to sudden hyperextension of the hock joint. Clinical diagnosis is straightforward due to the functional limitation of the lesion and the dramatic dropped hock position during weight-bearing of the affected hindlimb. The combination of bandage and splinting technique we described in this case report study is an easy and functional measure to correct the caudal reciprocal apparatus disruption. The functional as well as the cosmetic result of the described technique is good to excellent. This conservative technique is an effective measure in calves to correct GMR compared to more radical surgical procedures described in foals, adult horses and dogs.

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