

Impacts of Flunixin Meglumine injection on wound score and swelling appearance of either rubber ring castrated and tail docked or surgically castrated and docked lambs

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Abstract

Our hypothesis was that administering Flunixin Meglumine (FM) to lambs that were either rubber ring castrated and docked (RR) or surgically castrated and emasculator docked (SC) would decrease swelling and wound appearance score. Rambouillet ram lambs (n = 181) were allocated in a completely randomized design in a 2 x 2 factorial arrangement of treatments to determine the effects of RR or SC and emasculator docking on ram lambs with administration of FM (2.2 mg/kg of BW) or saline (S; 2.2 mg/kg of BW). Wounds were assessed on days 4 and 7 post-treatment. The Wound Assessment Scale ranged from 1 – 5 and was determined from levels of discharge, scabbing, and wound healing. The swelling score was also a 1 - 5 scale, varying from no swelling, large amounts, or healed. Scrotal wound exhibited a treatment x day interaction ($P < 0.001$), however tail wound score ($P = 0.84$) and scrotal swelling ($P = 0.36$) were not affected. The SC treated lambs had a higher wound score on day 4 and 7 when compared to the RR treated lambs for both the scrotum and tail score ($P < 0.001$). Flunixin Meglumine had no effect on wound score of the scrotum ($P > 0.50$) and tail ($P > 0.43$) for both RR and SC groups. However, RR treated lambs had higher swelling scores on day 4 and 7 ($P < 0.001$). Flunixin Meglumine administration did not influence swelling score in treated lambs ($P > 0.43$). Surgical castration resulted in an increase in wound score compared to rubber ring castrated and docked lambs, but rubber ring castrated and docked lambs had an increase in wound swelling. Flunixin Meglumine did not have an impact on either wound score or wound swelling, regardless of castration method.

Key words: Castration, Docking, Flunixin Meglumine, swelling, wound

Introduction

A wound is defined as the breaking of cellular tissue and the repair process that follows (Kumar, 2013). Wounds can originate from different sources, like from a paper cut or a surgical operation, but the healing process is all the same. Wound repair is a 4-step process, and treatment and recovery depend on the severity of the wound (Mendonça and Coutinho-Netto, 2009). Castration and docking are management tools used for livestock health management. Castration is the removal of testicles and there are several different recognized methods to perform the procedure. Castration reduces aggressive behavior and prevents unwanted pregnancies (SID, 2003). Docking is the partial or complete removal of the tail. Docking prevents flystrike, which occurs when the soft feces collect at the head of the lambs' tail (SID, 2003). This collection of feces attracts flies and the flies will lay their eggs on the lamb. The eggs mature and hatch into maggots. The lamb will become ill because of the open wound caused by the maggots (SID, 2003). Castration and docking can improve animal welfare and provide economic advantages to the producer. Producers should be aware of the pain their animals may experience. Analgesics may be a solution to alleviating pain in livestock production. Scientists are currently studying analgesic work for sheep and cattle to provide pain relief. Research could assist livestock to endure less pain during this stressful period.

Hypothesis

Our hypothesis was that administering Flunixin Meglumine (FM) to lambs that were either rubber ring castrated and docked (RR) or surgically castrated and emasculator docked (SC) would decrease swelling and wound appearance score.

Methods

Rubber ring castration and docking	Surgical castration and emasculator docking
Rubber ring castrated and tail docked (RR) receiving an injection of saline 15 to 30 min prior to banding (2.2 mg/kg of BW SQ; RR-S)	Lambs surgically castrated (SC) and emasculator docked receiving an injection of saline 15 to 30 min prior to procedure (2.2 mg/kg of BW SQ; SC-S)
Flunixin Meglumine 15 to 30 min prior to banding (Flunixin Meglumine; 2.2 mg/kg of BW SQ; RR-FM)	Flunixin Meglumine 15 to 30 min prior to procedure (Flunixin Meglumine; 2.2 mg/kg of BW SQ; SC-FM)

Table 1: Swelling and Wound appearance adapted by Small et al. (2014).

Swelling Score	Wound appearance score
No swelling (1)	Edges close together, dry scab (1)
Slight swelling along wound edges (2)	Small area < 1 cm or wet and oozing but no visible pus (2)
Large area of swellings, but soft (3)	Medium area 1 to 5 cm of wet and oozing with small amount of pus (3)
Large area of hard swelling; pitting edema (4)	Large area > 5 cm necrotic with copious pus drainage (4)
Reducing hard swelling with loose cover, healing phase (3)	Granulation tissue forming, but still oozing, healing (3)
Scarring or nodule, healed (2).	New skin evident, shiny but not oozing (2)

Results

- Wound score analysis of the scrotum exhibited a treatment effect ($P < 0.001$) and a tendency for a time by treatment interaction ($P = 0.07$). The surgical castration treatment showed a significance on both day 4 and 7, while no effect was found for the RR group.
- The wound score analysis of the tail found a treatment effect ($P < 0.0001$) in the surgical treatments, where no significance was found in the RR group ($P < 0.12$).
- Swelling score analysis had similar results to tail and scrotum swelling finding a treatment effect ($P < 0.0001$) for both scrotum and tail. A day effect was found in the scrotum ($P = 0.04$) and a day by treatment interaction in the tail ($P < 0.0001$).
- Swelling of the tail observed in the RR group had higher levels on day 7 while the surgical group decreased in swelling (Table 2).
- Swelling of the scrotum had similar results as the RR group had higher scores for swelling when compared to the surgical group.
- There was no difference between Flunixin Meglumine and saline treatment for wound analysis ($P < 0.92$ for tail, $P < 0.96$ for scrotum) and for swelling analysis ($P < 0.99$), disagreeing with Small et al. (2014) for surgical castration and docking.

Table 2 Swelling and wound score between different castration/docking technique and analgesic treatments

Variable ²	Treatments ¹				SEM	P-value
	RR-B	RR-S	SC-B	SC-S		
Day 4					0.06	0.0001
SST	2.83	2.73	2.17	2.16		
SSS	2.94	3.07	1.95	1.89		
WST	1.00	1.24	2.33	2.41		
WSS	1.22	1.42	2.05	1.63		
Day 7					0.06	0.0001
SST	3.07	3.24	1.82	1.81		
SSS	2.94	3.07	1.74	1.67		
WST	1.23	1.24	2.40	2.41		
WSS	1.07	1.42	1.59	1.63		

¹ Treatment include RR-B (rubber ring-banamine), RR-S (Rubber ring saline), SC-B (Surgical castration-Banamine), and SC-S (surgical castration-saline).

² Variables include SST (swelling score tail), SSS (swelling score scrotum), WST (wound score tail), and WSS (wound score scrotum).

Conclusion

- Our results for wound and swelling disagree with Small et al. (2014) and is likely due to no incidences of flystrike in our flock.
- Swelling score increased in the RR group.
- Wound score increased in the surgical castration group.
- Flunixin Meglumine did not have any affect for swelling or wound score.

References

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