

Proximal interphalangeal joint arthrodesis in horses: A protocol for meta-analyses of the retrospective studies

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Abstract

Introduction: The diseases of the equine proximal interphalangeal joint (PIJ) occur frequently and usually it is necessary to perform arthrodesis as a treatment option. A reasonable number of retrospective studies have been published referring to the outcomes of different ways to promote ankylosis of this joint, either from the point of view of indications or by the techniques employed. The aim of this study is to carry out a meta-analysis of retrospective studies of PIJ arthrodesis in horses to do a better evaluation and interpretation of the likely outcomes of different forms of intervention.

Methods and analysis: A systematic review of the literature will be carried in the CAB, Scopus, Web of Science, ScienceDirect, PubMed, following the recommendations of Cochrane and PRISMA, in search of retrospective studies of proximal interphalangeal arthrodesis in horses. Information on the length of hospital stay, time of rigid external immobilization (casting), time to return to activities, survival rate, presence of lameness after the end of treatment, will have their effects measured by standardized mean difference or odds ratio. The meta-analysis will be performed using fixed and random effect.

Background

The disorders of the proximal interphalangeal joint (PIJ) are frequently present in the clinical routine of horses, represented by fractures of different types in the first and second phalanges, dislocations, traumas, sprains, and especially the degenerative processes. [1,2]. Being that in all the previous conditions, the process tends to evolve to osteoarthritis [3]. The horses involved in activities of the western modalities seem predisposed to injuries in this joint, probably due to the flexion and torsion forces generated during abrupt stops and changes of direction [3,4].

Conservative approaches for the osteoarthritis treatment in PIJ, in general, do not completely stop the process, in which some degree of lameness persists, relapses or aggravations of the pain processes occur, keeping the animal under medication, which can often configure doping. In addition to all expenses that will not lead to the definitive resolution [5-7]. The promotion of fusion (ankylosis) is often the effective option in the categorical resolution of proximal interphalangeal arthropathies, especially about osteoarthritis processes [3].

Similar to occurs at the distal tarsometatarsal and intertarsal joints, the PIJ movement is reduced, so ankylosis does not interfere during higher performance activities, and it has been observed that animals are likely to return to athletic activities after surgery [2,3,8]. In this regard, the description of different techniques to promoting PIJ ankylosis was carried out, with surgical interventions using plates and screws being the most efficient [3,8-10].

A reasonable number of retrospective studies have been published referring to the outcomes of different ways of promoting PIJ ankylosis in horses, either from the point of view of indications or by the techniques employed. Because of this, the aim of this work is to carry out a meta-analysis of retrospective studies of PIJ arthrodesis in horses to better characterize the likely outcomes of different forms of intervention.

Method

A systematic literature review will be carried out previously, following the recommendations of Cochrane review protocol [11], of the Vries, *et al.* [12] and PRISMA statement [13,14].

Specify the population/species studied

Equines (horses, mules, donkeys) of any breed, sex or age.

Specify the disease/health problem of interest

Proximal interphalangeal arthropathies (osteoarthritis, septic arthritis, dislocation (subluxation), joint instability, proximal and/or middle phalanx fractures and deformities).

Specify the intervention/exposure

Performing the PIJ fixation using orthopedic plates (DCP, LC-DCP, LCP, or other systems) made of stainless steel or titanium alloys, with or without transarticular cortex screws, or using only transarticular cortex screws. These procedures can be performed in standing or recumbency. Facilitation of ankylosis by the injection of alcohol (ethanol) or monoiodoacetate in any volume or concentration, associated or not with casting.

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Specify the outcome measures

Stay of hospitalization, time of casting, time to return to activities, survival rate, and presence of lameness after treatment.

Search strategies

CAB Abstracts

((((equine) OR (horse)) AND ((pastern) OR (proximal interphalangeal joint)) AND ((arthrodesis) OR (ankylosis)) AND (retrospective study))

Medline/PubMed

((((equine) OR (horse)) AND ((pastern) OR (proximal interphalangeal joint)) AND ((arthrodesis) OR (ankylosis)) AND (retrospective study))

Scopus

TITLE-ABS-KEY ((((equine) OR (horse)) AND ((pastern) OR (proximal AND interphalangeal AND joint)) AND ((arthrodesis) OR (ankylosis)) AND (retrospective AND study)))

SciencDirect

((equine OR horse) AND (pastern OR proximal interphalangeal joint) AND (arthrodesis OR ankylosis) AND retrospective study)

Web of Science

TS=(((equine OR horse) AND (pastern OR proximal interphalangeal joint) AND (arthrodesis OR ankylosis) AND retrospective study))

Identify other sources for study identification

The reference lists of included studies and reference lists of relevant reviews will be checked.

Study selection

Initially, pre-screening will be carried out based on the title and abstract by one of the authors (AFS), followed by the full-text screening of the eligible articles by two independent authors (AFS and NFP). If necessary a third opinion will be consulted (ALVZ).

Type of study

Inclusion criteria: Retrospective studies and case series (full-texts with three or more cases);

Exclusion criteria: Isolated case reports, book chapters, event summaries, review articles, editorials, letters to the editor, preprinted texts, experimental

Type of animals/population

Inclusion criteria: Equines of any breed, sex or age.

Exclusion criteria: Other species.

Type of intervention

Inclusion criteria: Any interventions to promote ankylosis of PIJ.

Exclusion criteria: not applicable

Language restrictions

Inclusion criteria: any language;

Exclusion criteria: not applicable.

Assessment risk of bias and/or study quality

By use of SYRCLE's Risk of Bias tool [15].

Data analysis/synthesis

Information on the length of hospital stay, time of rigid external immobilization (casting), time to return to activities, survival rate, presence of lameness after the end of treatment, will have their effects measured by standardized mean difference or odds ratio.

The statistical model of analysis

The meta-analysis will be performed using fixed and random effect.

The statistical methods to assess heterogeneity

Initial assessment of heterogeneity will be through visual inspection of forest plots, I^2 (> 50%) and Cochran Q statistics.

The method for assessment of publication bias

Funnel-plots and Egger's test.

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Authors' contributions

AFS: conceived the study idea, devised the study methodology, responsible for protocol writing and developed the search strategy. NFP: will screen identified literature, conduct data extraction and analyses the review findings. ALVZ: design and coordination of the study. All authors agreed on the final version of the manuscript.

Conflicts of interest

The authors declare they have no conflict of interest.

Animal welfare/ethical statement

Not applicable.

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