Comparison of Cellular Properties of Equine Multipotent Mesenchymal Stromal Cells After the Use of Two Different Isolation Techniques


Enzymatic tissue digestion and explant technique showed no major impact on characteristics of isolated multipotent mesenchymal stromal cells (MSCs). MSCs isolated by digestion might be advantageous for application in equine tendon regeneration caused by higher expression levels of the tendon marker scleraxis. Additionally, higher MSC numbers are available. Authors’ addresses: Large Animal Clinic for Surgery, University of Leipzig, An den Tierkliniken 21, 04103 Leipzig, Germany (Gittel, Brehm, Burk, Ribitsch); Translational Centre for Regenerative Medicine (TRM), University of Leipzig, Philipp-Rosenthal Str 55, 04103 Leipzig, Germany (Juelke); Department of Veterinary Anatomy, Histology, and Embryology, Faculty for Veterinary Medicine, Justus-Liebig-University, Giessen, Frankfurter Str 98, 35392 Giessen, Germany (Staszyk); Equine Hospital, Clinic for Equine Surgery, University of Veterinary Medicine, Veterinärplatz 1, 1210 Vienna, Austria (Ribitsch); e-mail: Claudia.Gittel@vetmed.uni-leipzig.de. *Corresponding and presenting author. © 2013 AAEP.

1. Introduction
Mesenchymal stromal cells (MSCs) are a promising tool in regenerative medicine for treatment of tendon lesions in horses. MSCs can be isolated from various solid tissues either by enzymatic digestion or by explant technique. Thereby, differences in cell characteristics caused by different preparation techniques can be expected. Therefore, the aim of this study was to investigate and compare cell features of MSCs from solid tissues after different isolation methods are used.

2. Materials and Methods
Equine adipose tissue, tendon, and umbilical cord matrix were harvested, and MSCs were isolated by enzymatic digestion with collagenase and by explant technique. Subsequently, cell yield, growth and differentiation potential, and tendon marker expression were compared.

3. Results
Isolation of MSCs by enzymatic tissue digestion yielded significantly more MSCs in a shorter period.
of time. No major impact of the isolation method on proliferation, migration, and differentiation behavior of the MSCs could be detected. Interestingly, compared with MSCs isolated by explant technique, a significantly higher expression level of the tendon marker scleraxis was found in MSCs isolated by collagenase digestion.

4. Discussion
Differences in cell characteristics caused by isolation methods could make enzymatically isolated MSCs advantageous for certain clinical applications. Furthermore, higher obtainable cell numbers could enable an efficient practice of enzymatically isolated MSCs.

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