

STEM CELL THERAPY FOR ORTHOPEDIC INJURIES

TheHorse.com: Welcome to The Horse's webcast on Stem Cell Therapy for Orthopedic Injuries!

TheHorse.com: The video presentation will begin at 8 p.m. EST. This chat will also start at 8. We have an hour to answer your questions about stem cell therapy.

TheHorse.com: It's 8 p.m., and we're ready to get started!

TheHorse.com: I'm your moderator, Michelle Anderson, digital editor of TheHorse.com.

TheHorse.com: We are joined by our expert panelists, Dr. Ross Rich of Cave Creek Equine Surgical and Diagnostic Imaging Center and Dr. Bob Harman of Vet-Stem, Inc.

TheHorse.com: Please reload your pages if the video hasn't started.

Dr. Ross Rich: Hello everybody.

TheHorse.com: Please also hit the play button on your screen.

Bob Harman, DVM: Good evening everyone

TheHorse.com: Marianne Merriam: My horse has wobbler's disease --can you do stem cell therapy on a cracked C6 vertebra? If not, why not?

Dr. Ross Rich: Yes, of course you can do stem cell therapy on a "cracked" (fractured) 6th cervical vertebrae to promote bone healing. As far as solving the wobbler problem, this may or may not resolve once the fracture heals and the bone stabilizes. If the fracture causes instability of the vertebrae, which then causes pinching of the spinal cord and the wobbler situation, then it is possible that the wobbler problem could resolve after the fracture heals. Adipose-derived stem cells can and do promote bone healing, and can "restart" bone healing in cases where bone healing has stopped (non-union fracture).

TheHorse.com: Pam Rogers : The majority of your treatment protocols identify direct tissue injection of cells. Have/can you do a systemic delivery and if yes, have you looked at secondary results, i.e., increased pulmonary function or decreased inflammation both locally and systemically?

Bob Harman, DVM: Very astute question and observation. Yes, systemic stem cells will home into areas of inflammation. In humans treated IV for heart disease, the side benefit is increased pulmonary function. No good published data yet in lung disease in the horse, but it makes sense from the human treatment experience. Also, almost every dog treated with stem cells for arthritis, are given IV cells for improvement of pain and inflammation at sites of then the joint.

Mariann: What is the typical cost of this treatment?

Dr. Ross Rich: Typical cost is \$2800 to \$3500 depending on the extent of treatment needed, and how many tissues need to be treated.

Guest: Greetings

Guest: good evening

Jacqueline: Stem cells can also be collected from the blood? This is less invasive than bone marrow!

TheHorse.com: Again, if your video isn't playing, please hit play.

Bob Harman, DVM: The blood contains almost zero stem cells. They are very rare and would need to be cultured. This is almost never done. It would be difficult, time consuming and expensive compared to taking the cells from the richest source, fat. There are 1000X more stem cells in fat tissue than even bone marrow.

Jacqueline: Also, contrary to humans you can bank blood from one horse and treat another horse?

Bob Harman, DVM: If your question is regarding using donor stem cells to treat a different horse, that is not legal by FDA guidelines. It would mean creating a bank of donor cells and using them to treat another horse. It is not done today and requires many years and many millions of dollars to get an FDA approval. Someday we hope to be there, but today, you can only use stem cells from the same horse that needs the treatment.

Guest: What do you think about this kind of treatment compared with PRP?

Jacqueline: What about PRP treatments. Are they as effective?

Bob Harman, DVM: PRP provides short term growth factors to reduce inflammation and pain, but there are no live platelets after the first couple of days. Stem cells provide the machinery of repair. Like IRAP, veterinarians may use them in combination. There are no stem cells in PRP, so for significant injuries that need regeneration, stem cells are the better medical choice.

Dr. Ross Rich: No, PRP is not anywhere near as effective as Adipose-Derived Stem Cells.

Mike: When you culture the stem cells to expand them, do they de differentiate?

Bob Harman, DVM: You need to be very careful when culturing to use the right media and methods to keep them from differentiating. You do not want them to differentiate. They are most powerful in their natural condition. With stem cells from fat, we use them fresh and generally don't culture unless we run out of cells.

Sandy: Can stem cell therapy help chronic issues....such as, a hock injury that is now naturally fusing.

Dr. Ross Rich: I do use adipose-derived stem cells to help surgically fuse injured lower hock joints. Usually associated with fractures of those bones. They speed the fusion process, and in those cases where bone healing has slowed or stopped, they "kick start" the bone healing process again.

Guest: Is there a difference of quality in the stem cells taken from bone marrow versus fat?

Dr. Ross Rich: I can tell you that I began using bone marrow derived stem cells, and had little success

with them. My success rates improved dramatically as soon as began using adipose-derived stem cells. I no longer use bone marrow derived stem cells in my practice because of this

Rachel: I wanted to know if stem cell therapy would be beneficial to a horse who suffered a traumatic injury over a year and a half ago. After having a complete neuro exam done he was rated as >2 out of 5. He's showing 40% compression between the 3rd and 4th vertebrae and 30% between the 4th and 5th. Our vet considered these "soft findings", but since he's showing neurological signs he was considered a candidate for surgery to fuse the vertebrae and insert the basket, but we would prefer not to have to do this and are trying to find alternative treatments. Would stem cell therapy possibly be beneficial even though it's been so long since the initial injury?

Dr. Ross Rich: In my experience with spinal cord compression cases, stabilization surgeries for compressive type problems are probably the most important treatment. There are some anecdotal reports of a few cases of spinal cord injury in horses without compressive lesions, that were treated with stem cells with significant improvement of there neuro signs. However, when you have a compressive lesion of the spinal cord by the bony vertebrae, stem cells will not relieve the bone compression of the spinal cord in my opinion.

Hannah: Would stem cell therapy be applicable to foals affected with Epitheliogenesis Imperfecta?

Bob Harman, DVM: Epitheliogenesis is a hereditary disease and foals usually die early. Skin does not grow properly. Although stem cells can stimulate regrowth of skin cells, this is likely too severe a condition to be able to treat with stem cells. The genetic defect would be a big problem to overcome. In the future we hope this might be possible.

Guest: What is layup time for joint treatment

Dr. Ross Rich: The standard recovery time for tendon and ligament injuries in my practice is 4.5-5 months before they are ready to return to full work and competition. Joints may take longer, depending on the extent of bone and cartilage damage in the joint (typically 6-9 months before ready to return to full work and competition).

Guest: Have you ever thought about placental stem cells?

Bob Harman, DVM: Yes we have worked with those types of cells for several years, but it is very expensive to collect at birth and have for the future. You cannot use donor placental cells for a different animal as it is not legal by FDA and runs risk of rejection. Most cords and placenta are pretty contaminated in the stall at birth and hard to even get bacteria free.

TheHorse.com: Anne Moore, MD: I have had good short term results with stem cell joint injections after surgery on the stifle. I hope you will address the long term follow up! Thanks!

Dr. Ross Rich: Dr. Moore, I have had very good short-term and long-term results with Adipose-Derived Stem Cell treatment of damaged stifle joints. We are treating several different types of stifle injuries, such as femoral condyle chondromalasia (damaged joint cartilage), partial cranial cruciate ligament tears, meniscus tears, and meniscotibial ligament injuries. We are in the process of evaluating our large number of stifle injuries treated over the past 8 years with Adipose Derived Stem Cells. I do not have exact numbers and results yet (hopefully by this summer we will have these numbers and success rates), but clinically I think my cases have done significantly better with the addition of adipose-derived stem cell therapy, than those stifle injuries treated prior to the addition of stem cell therapy.

Glenna: Would this be helpful for a horse that was diagnosed with navicular disease 3 years ago or is it too late to help

Dr. Ross Rich: Yes, we use Adipose-Derived Stem Cells to treat ringbone (osteoarthritis of the coffin or pastern joints) and navicular disease on a regular basis. We usually use stem cells along with IRAP and/or Tildren for the treatment of these particular problems, and have been very successful. In your particular horse, with a 3 yr. history of chronic navicular disease, we often find multiple injured structures along with the navicular bone. It is important to treat all of the injured structures to be successful.

Dr. Goffredo: Dr. Rich, Have you tried bone marrow derived stem cells again recently? You should

Dr. Ross Rich: Yes, several within the past year, and was disappointed with the outcomes with bone marrow derived stem cells. In fact, I have only had “flares” with bone marrow derived stem cells, along with further injury of the injured structure in 2 of the cases. I will not try them again. I have not had negative experiences with adipose-derived stem cells.

Guest: Is there an age at which you start seeing a marked reduction in response to treatment?

Bob Harman, DVM: Bone marrow stem cells really age fast and by time human or animal are older, they have few stem cells left. Stem cells from fat tissue are protected and even in very old horses, they have a large number of active stem cells. We have seen horses over 30 with good stem cell harvest numbers from fat that responded well to treatment. Lucky for us older guys. :-) I am 60 years old and had my own shoulder with severe rotator cuff injury treated last year with my own adipose stem cells. I am pain free and back playing polo and tennis.

TheHorse.com: Stephanie: Do you have specific injuries in which stem cell therapy is your first line of treatment (aside from stall rest and NSAIDS) due to the success you have experienced? Likewise, do you have other injuries where you have observed significantly less success following treatment?

Dr. Ross Rich: This is a very good question. Adipose-derived stem cells are my first line of treatment for tendon tears, ligament tears, non-healing bone injuries, and damaged joints. They promote faster healing of these structures, they are very anti-inflammatory, they reduce scar tissue formation, and provide stronger repair tissues than other treatment methods. They significantly reduce re-injury rates. Rest and NSAIDS alone are important in the first couple of days after an injury, but the outcome of the injury is far superior when treated with Adipose-Derived Stem Cells, significantly improving the long-term outcome of the injury. Very mild injuries may not benefit significantly from stem cell therapy, since these very mild injuries often heal very quickly on their own. Many of the injuries we now treat with Adipose-Derived Stem Cells used to be career-ending injuries for the horse athlete. That is not the case anymore.

I have learned that some, but not all, of the badly scarred, old, chronic ligament and tendon injuries do not improve dramatically with stem cell treatment. This is one of the reasons it is important to institute stem cell therapy early in the treatment of ligament and tendon injuries, rather than as a last resort treatment. We had hoped that we could treat some of these badly scarred structures, and see replacement of the majority of the scar tissue with new tendon or ligament tissue. Although there was some replacement tissue with a more normal tendon or ligament tissue appearance after treatment with stem cells, the improvement was small. We have more work to do to figure out how to help these types of chronic, scarred tissues.

TheHorse.com: Karen: Is Stem Cell to replace hyaluronic acid joint injections?

Dr. Ross Rich: No, I don't think stem cell therapy will eliminate the use of HA in joints. However, in the future they may be used together more frequently, to treat damaged joints. I would like to see Adipose-Derived Stem Cells replace the use of steroids in most joint injuries, since steroids do not necessarily promote healing of damaged bone, joint cartilage, and ligaments within the joint; whereas, stem cells do promote healing. If we can achieve healing, instead of masking the pain with steroids in high motion joints, we can probably make these injured joints last many years longer, with the therapeutic use of stem cells for joint injuries.

Guest: How long would a joint treatment be expected to last?

Dr. Ross Rich: Well, I expect to achieve long-term athletic success, but this somewhat depends on the extent of the joint injury, and the chronic damage in the joint. But as a general rule, with the adipose-derived stem cell joint protocol that we use, I expect to get 2-5 years out of the joint before pretreatment, and oftentimes we achieve much longer duration of effect.

TheHorse.com: We are out of time. Thank you everyone for your time tonight!

TheHorse.com: Thank you Dr. Rich and Dr. Harman!

Bob Harman, DVM: You are very welcome. Thanks for all the great questions.

Dr. Ross Rich: You're very welcome! My pleasure. Have a good night.

Bob Harman, DVM: Your listeners are very sharp!

TheHorse.com: You will be able to watch this video archived on TheHorse.com!

Mike golden: Thank you

TheHorse.com: If you have any additional questions that didn't get answer tonight, feel free to contact us at FarmCall@TheHorse.com.

TheHorse.com: Good night, and thanks again for all of the great questions!