The Science About Fascia - Ref 159RS

with Dr. Robert Schleip

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TRANSCRIPT

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Steven Bruce
Now, when we eventually get today's guest in, I'll be talking to Dr. Robert Schleip, who has a doctorate in human biology, he's also a psychologist, he is a Feldenkrais practitioner, as well as a rolfer. But his particular interest is in the science of fascia. And what we're going to be talking about today, fascia is a very, very popular topic, obviously, in the Academy, but we'll be talking about fascia as a sensory organ, fascia in sport and in movement. Robert, can you hear me?

Dr. Robert Schleip
Yes, I can see you. My adrenalin has been going up and down. That's nice.

Steven Bruce
I normally do a sort of 10 second intro for our guests.

Dr. Robert Schleip
He has been the discoverer of fascia and whatever else you are telling them.

Steven Bruce
So how was my pronunciation of Die Rolle der Faszien in der Arbeiten mit Narben, Adhäsionen und kollagenen Versteifungen?

Dr. Robert Schleip
That is a title of workshop I'm doing, in German.

Steven Bruce
Did I pronounce it correctly?

Dr. Robert Schleip
That means working with scar tissues, adhesions, and stiffness changes in fascia.

Steven Bruce
Excellent.

Dr. Robert Schleip
But your German sounds very good.

Steven Bruce
Thank you very much. Let's leap straight in, Robert. What is it that's driving your interest in fascia right at this moment?

Dr. Robert Schleip
The research by the Steccos is very interesting about the hyaluronan and that seems to be responsible for some of the short-term changes in manual therapy. So, we had all these doubts that was rolfing manipulation, which is my manual therapy background, or was osteopathic or chiropractic manipulation that you could change the architecture of collagen fibers in a few minutes, because that would be very brutal work that you need to do. But nevertheless, we can feel that the tissue is softer after we do our manipulations. So, the question is, where is the change in stiffness coming? And they hyaluronan seems to be now a very highly likely explanation. And that within minutes, you can change not only the amount of hyaluronan, but also the binding condition, whether it's slippery hyaluronan or glue-like, very viscous, like cold honey condition of hyaluronan. Hyaluronan can be in both conditions and apparently when we apply pressure and shearing motion, we change it from a sticky condition into a slippery condition so you can hear how excited I am about it.

Steven Bruce
So, this is the same stuff, the hyaluronic acid that would be injected into a joint for arthroscopic procedures and so on?

Dr. Robert Schleip
Women, at least here in Schwabing in Munich where I live, if you want to look fancy, you have twice a year hyaluronan injections for lots of money to get the wrinkles straightened in your face.

Steven Bruce
Right, well don't say we don't bring new job opportunities to you from the Academy. So, how are we doing this? What is driving this change in hyaluronan?

Dr. Robert Schleip
Apparently, shearing manipulation, that is not proven, but we have a high indication for that, because the Steccos, Carla Stecco and her team and her brother, Antonio Stecco, at the University of Padova in Italy, they not only found out that hyaluronan is increased if you stimulate the fibroblasts with endocannabinoids. So, they didn't say should smoke marijuana but if you stimulate the endocannabinoid receptors, which are not there for marijuana smoking but for other physiological relaxation effects, and we know that osteopathic manipulation increases endocannabinoids that has been known and people feel more relaxed and peaceful. But that was a surprise. One of the surprises that when you stimulate the endocannabinoid receptors on the fibroblasts, that then they produce more hyaluronan. They put out vesicles, fluid bags, which are filled with hyaluronan. And that would be already one thing to save the money for the hyaluronan injections in your face. And the other thing is, they showed that some fascia has 10 times more hyaluronan density than others. If you look up what is the difference between those that have lots of hyaluronan and more water binding and who feel more juicy, it is the amount of shearing motion in the immediate vicinity, like the retinaculum or the ankle, that has the highest hyaluronan density, probably because underneath the tendons every week they make large sliding movements. So, if I want to have more heroin on my face, I should do

large yawning movements and laughing movements. In order to get more juicy hyaluronan water binding in my face, but also in my hip joint.

Steven Bruce
I don't know about the rest of the audience here but this is the first time I've heard of this. So how long has this been known, this phenomenon?

Dr. Robert Schleip
A year. One and a half years. So, these are all new things that you don't find in textbooks yet. You find them if you love to read small print PDF articles, like I love to do, to read them before breakfast. And not everybody wants to do that before breakfast but that is my mental food. And it will also be a couple of years until it gets into the curriculum of different schools because it's hot off the research labs.

Steven Bruce
As you probably heard me say we've had people on the show talking about fascia in the past and almost all of them have said that this notion that we were brought up with as osteopaths, chiropractors, and so on that we are stretching the fascia somehow when we do our treatments cannot be physiologically true because to stretch the fascia would be to cause an immense amount of damage using an immense amount of force. But is making it slipperier sufficient to achieve whatever it was we were trying to achieve by stretching it?

Dr. Robert Schleip
Yeah, there has been a study, where I've been one of the supervisors, by Annika Griefahn and she measured the shearing motion between the first layer of the lumbar dorsal fascia, which is basically the upper neurosis of the latissimus dorsi and gluteus maximus, in relationship to the fascia layer underneath, which is kind of the facial envelope around the erector spinae. And we know from Helene Langevin's work that they tend to stick together in people who have chronic low back pain. We don't know why, whether that's injury and scarring or whether it's lack of movement or both. But we know this is a very important difference between chronic low back pain patients and normal healthy patients. And probably that is very plausible, it's influencing the lack of proprioception. So, if you have a Ruffini receptor between the two layers and you go forward to bend your shoes, in a normal person, you would feel what your lumbar spine is doing and the fascia. But if there is no movement happening between the two layers, the Ruffini receptor between cannot feel anything. So, we know that the adhesion is contributing to proprioception most likely. And the student that I supervise, she did ridiculous foam rolling treatment, which is very cheap, and you cannot compare it with an osteopath, where people put part of their body weight on a foam roller for six minutes, and afterwards, there was no sliding motion between it. In a very elegant measurement with ultrasound analysis

Steven Bruce
There was no movement over the roller, they were just resting on the roller?

Dr. Robert Schleip
Yeah. Which is almost a paradox because on a roller, you are not doing shearing motion very well, you're gluing, you're compressing the two layers and you could have expected them being more glued afterwards. So, what an osteopath is doing is much more skillful than a roller, because you're not only pressing down, you're doing a forward horizontal sliding movement.

Steven Bruce
This is not to say, of course, that the chiropractors aren't doing very sophisticated movements as well, I hate to exclude the chiropractors or physiotherapists.

Dr. Robert Schleip
And the cupping people actually. So, cupping would be the opposite of foam rolling. So, everybody is doing mechanical stimulation but are you compressing, are you tractioning? Are you doing either one with shearing motion? These are the questions that I love to study. And based on the hyaluronan study I mentioned from the Steccos, I would think the shearing motion is an important component.

Steven Bruce
All right. Well, this isn't the first time on the show that it's probably perhaps been brought to our attention that we may have success with our treatment but not always for the reasons we thought we were having success. So, it's fantastic to learn this sort of stuff, I suppose the obvious question is, what is the most efficient way of stimulating those receptors? The cannabinoid receptors? Yeah.

Dr. Robert Schleip
Smoking marijuana is not my favorite, it used to be my favorite style. But I think mechanical deformations, so here I have my news topic. So, you would have one fascia layer on top, the dense fascia and another layer underneath. And in between, you do not have an amorphous fluid, you have another fibrous matrix. So, if you slide one layer in relationship to the other, it's not really sliding, it's a shearing motion. Because if it's sliding, you assume that there is nothing substantial in between. But if you have a fibrous net in between and you move one to the right and the other to the left, you're stretching some of their diagonal fibers. And if you can go more to the left than to the right, you can assume that one of the diagonal fiber directions is a little bit more stiff than the other, the one from the left to the right, or from right to the left. So, I think shearing motion is a key for this lubrication effect. But that's cause for speculation and we need to do more research to find that out.

Steven Bruce
Yeah, sure. There's been quite a lot of research, I know this isn't what we're here to talk about, there's been quite a lot of research about the medical use of cannabis, hasn't there? Has anybody looked into it specifically in how it could be used advantageously with fascial lubrication, if you like?

Dr. Robert Schleip
We are right now financing a study with the Steccos based on a very successful online summit that we had, we raised a lot of money a year ago and we were able to donate five-digit amount to the University of Padova to do a very nice research together. But that is not looking at cannabis, it's looking at the connections with the autonomic nervous system, sympathetic and parasympathetic. And I'm very keen on that. But as soon as we are finished with that, I already talked with Carla Stecco and with Catarina Fede that it would be nice to use CBD, cannabidiol. So, it is one of the potent substances that works this out, they have a synergetic effect, where we think it's stimulating the endocannabinoid receptor type one, and not the type two. So that would be a very nice study to do, to see if that then leads to the expression of the hyaluronan vesicles. Because in the study that Catarina Fede did before, she didn't use cannabis she used as a synthetic analog condition to it. But the CBD oil, many people take it in order to sleep better, I take it in the evening, and you put some drops under your tongue. A lot of people are doing that. But the research is not yet completed, how potent it is.

Steven Bruce
Yeah, and I guess I'd be interested to know if you take it orally, which receptors does it reach? All of them? Is there a case for topical application of CBD oil?

Dr. Robert Schleip
I would need to go on the internet to find out to be honest.

Steven Bruce
That's fine. Well, we'll steer away from cannabis for now. Somebody in the audience has asked if you could just run through again, how did they measure the movement of fascia? You mentioned ultrasound.,

Dr. Robert Schleip
So, ultrasound is something that usually the medical doctors have it in the office. It's a huge apparatus, but you wouldn't find it in a manual therapy practitioner's office. But I predict that in three, four years, every fourth or fifth manual practitioner will have a sleek, nice ultrasound. I don't have one here right now, but they are not bigger than an iPhone. And you put them on the lumbar fasci and with the cable always out they protrude project to your smartphone or to a tablet. And that is something that you can have in your office and put it out of the drawer without pretending that you are high tech power medical surgeon. And I find these new ultrasound devices highly attractive, but they still have some shortcomings because they depend very much on the examiner. So, if you want to convince the client that your treatment was worth the money, you can actually use ultrasound very easily and look for a wonderful picture afterwards and look for an ugly picture before that is always easy. And then tell him this was before and now here we have it, and that convinces your client but you should not be convinced about it. So, ultrasound is very much coming. And we are now working together with some companies to make the shear motion into a quantifiable number. But right now, the computer has to work all night to give you a number, whether the shear motion is improved 10% or 30%.

Steven Bruce
Okay, so it begs the question, doesn't it, researchers at the moment, clinicians of the future can show that the fascia is moving better as a result of compression and or other treatment. How long does that effect last?

Dr. Robert Schleip
We don't know yet. The same as foam rolling. Yeah, all the studies so far are going 10 minutes, but not long after the treatment, the same as foam rolling. Yeah.

Steven Bruce
So, I guess, we should be selling more foam rollers and just saying, lie on this for six or seven minutes every few hours.

Dr. Robert Schleip
No, we should give the client a treatment with our hands and if they like it say, you can partly do it yourself. And I use my elbow to locate these places on their back, if they are sitting with their back to me and ask them to come and meet me. And first they do a clumsy movement. And then I ask them, no, feel where I am, right there, come and meet me. And if they do that, you can see their eyes changing. And they're really making contact. And then I gave them a foam roller ball usually, and ask them to do the same thing, not with the ball and the foam roller on the floor, but towards the wall. And then I asked him come and meet the ball. And you can see whether they do it with an embodied participation. And you also can see which ball is correct for them. The osteopath, but also manual other practitioners used to put two tennis balls into a sock and use them on the occiput. And there you can also instruct the client, how they allow their eyeballs to relax towards the occiput if they lie on their back. So, all these exercises are very nice. If you give them to the client at the end of a very impressive relaxation session, not if the session was not so good. But if they really liked it, then you can say here you can do it yourself and tell me next session, how it was and I may give you a second instrument or a second exercise. And then you give them a foam roller or you tell them this one would be the one for you. You can order it here and bring it to me next session and we experiment together.

Steven Bruce
Okay, I've had another question from Karen, that's come in, Robert. She says it would be interesting to know if there's been any research on the acupuncture meridian system and fascia. Apparently, it's been observed in dissections that there are little holes in the fascia that correspond exactly to acupuncture meridian points that were charted 1000s of years ago, she tells me.

Dr. Robert Schleip
There are two studies that I'm aware of that found a high degree of congruence between fascial anatomy, places that I'm going to describe, and the exact location of the TCM, of the Traditional Chinese Medicine, which is the main system but you should know that there are minority systems that claim that acupuncture points elsewhere. But in TCM, they are very exact and everybody in TCM, Traditional Chinese Medicine

agrees on them. The first one was from Professor Hartmut Heine here in Germany, he died a few years ago, and he showed that the majority, over 80% but not 99% were identical with perforation points of the fascia profunda, so not the subcutaneous fascia but the first layer of dense fascia underneath, where trius perforans so three vessels go through it, and there are about 100 places on it. And that was already impressive. The second one is methodologically higher, from Helene Langevin again, and she showed maybe eight years ago, that wherever the fascia profunda splits up into a septum that goes deep, for example, in the upper arm, the septum between the flexors and extensors, between the brachialis and the triceps. There you have more collagen because not only you have the envelope, but from the envelope you will have a vertical septum and that's where you can measure where the meridians are. And she also showed that 87%, if I'm correct, of the TCM points are exactly where you have these septae. And of course, the two systems agree to a large extent, not 100%, because the nerves they prefer to travel along the septae because they are more injury protected.

Steven Bruce
Yeah. Okay, there's some logic in that as well as the research. Lawrence has sent in a question. He says, you're attributing the symptomatic changes from shear motions due to increased lubrication, how do you know that it's not due to stimulation of the superficial sensory nerves, causing a sensory nerve stimulation resulting in reduction of symptoms?

Dr. Robert Schleip
Yeah, that would be possible. But maybe I didn't make it clear, we have not shown that the therapeutic application of shear motion improves hyaluronan. That was my hypothesis. That if we do that in the future, we would have it but we have not shown that in experiments. What was shown in experiment is that those fascia that have a high degree of shear motion like the retinaculum, that they have up to 10 times more hyaluronan then fascia like the epimysium around the trapezius or deltoid, which are also proprioceptively very important, but they don't have so much shearing motion, because the epimysium of the muscle, if you have a chicken meat you can see it, you cannot slide it easily in relationship to the tissue, to the muscle underneath. So, in the vicinity of the fascial membrane, there is very little sliding, shearing and therefore all this goes along with a lack of hyaluronan. And on the retinaculum, you have a lot of shearing motion and you have high hyaluronan. And if that is not by accident, then it is likely but not so sure. Yeah, so he's correct, this is not 100% guarantee. But it is quite likely if you improve shearing motion in your hip joint, in your facial fascia, that you would also increase the hyaluronan density. For me it makes sense, hyaluronan is a lubricant. If you practice shearing motion, the body says that you need more lubrication there. But if you're stagnant there, why should you produce lubrication?

Steven Bruce
Yes. I don't know who asked this question, but someone has asked whether it is the lack of hyaluronan that makes fuzzy fascia fuzzy?

Dr. Robert Schleip
What means fuzzy?

Steven Bruce
I don't know either.

Dr. Robert Schleip
Ah, okay. Maybe I have... Let me see, you said I was sharing slides? Oh, no, I don't have it here. No, I was not prepared for this. But Helene Langevin again, one of my heroes in the fascia field besides Carla Stecco, and she had shown that the two layers of the lumbar dorsal fascia are more glued together or more adhered together, less shearing motion, in people with chronic low back pain. But in the same analysis, she also showed that the edges of the fascia are more fuzzy or more rugged. So, the transition between the second layer of the lumbar dorsal fascia and the muscles is a very sharp and clear line in healthy people. And in low back pain people, it's a fuzzy, a less contrast-rich transition. And that is an interesting observation. So that would speak more for micro injuries than only for lack of movement.

Steven Bruce
Right. Okay. Can I take you back to something you said earlier on Camellia has asked about your idea of getting patients to meet you or meet their balls? Yeah. Can you explain exactly what you meant by that? As she says, are you talking meat at the point of pain or at the point of a trigger point?

Dr. Robert Schleip
It's more proprioception but it's also of course, a personal thing. We know from the two-point discrimination examination there is a tool, a caliber where you have two pins. And if you have 10 centimeters between them, and you touch the client carefully on their back and you ask them is one pen or is it two pens, most of them can feel that it's two pens, even if they touch you exactly at the same second, if it's 10 centimeters apart. With three centimeters or with two centimeters, none of the clients can tell that it's two, on their back, on their lips it would be different. So, two-point discrimination is a very accurate measurement for proprioceptive refinement on different body locations. And we know that myofascial pain, not all kinds, but particularly low back pain and also whiplash, goes along with deterioration or less refined proprioception in that area where they have the pain, not in the rest of the body. And then if I come towards the client and touch them, let's say lateral to L4, and I say come and meet me there. And they bring L1 and T12 and they bring the whole middle of the back towards me, which is not very refined. And then I say, of course, you found the right body part. Yeah, you're very much at home in your body. But can you be more precise? I'm here. I'm not there, I'm here, see if you can feel where I am. And they don't see it. And tell me that you are in contact with me there. And then they do again, a big clumsy movement, I say wonderful, you are in touch with the body. And the third or fourth time, they can move an area which is like three finger pads, like five or six centimeters large towards you. And then I'm touched, I feel like they are on the same level of sensitivity as I am.

Steven Bruce
And this is a therapeutic value?

Dr. Robert Schleip
Yeah, so that is very much influenced by my Feldenkrais background, and Thomas Hanna background, where you're not changing the physical body, but the embodiment from the inside. How much a client is at home and has a sensory refinement inside of their body. And I think that is a totally underestimated- no, not totally underestimated, but a richer aspect of manual therapy, then those people who are not engaging the client and only treating them. Let me free your fascia, you can daydream as much as you want. So why don't you talk with your wife on the phone. I can fix your psoas because I'm doing it. So if you engage the client with their mindful attention, to be not in daydreaming, but right at your fingers, you may be able to differentiate the image they have about their body. Well, the lower back is not just one wooden board, but it has very different areas of expression.

Steven Bruce
Danielle has asked a question about whether what you've described or how what you've described relates to neuromuscular technique and or trigger points, because he says it sounds like it might be an explanation or past explanation for the physiological results in both of those concepts.

Dr. Robert Schleip
In neuromuscular technique, I'm using a lot of modification of post isometric relaxation, for example, in order to get the Golgi tendon organs, which are embedded in fascia, they are not only in the tendons, they are all over the epimysium. And they are of course a very good tool to lower the tonus of an area. So that would be already an application that I use a lot. And what's good about the neuromuscular technique, post isometric relaxation, for example, is that the client is not only relaxed all the time, but they resist you a little bit. So, you ask them to resist, resist and then to let go, and they feel the difference. So that for me, is a very good avenue not so much to reach the spindles or the ruffinis, but the Golgi receptors. And the trigger points, I'm working a lot together with them. I would have loved to say it is a fascia that is tied in trigger points but most experts agree no, it's a rigor mortis-like contracture of muscle fibers at the point itself, and that you have an oxygen crisis there. But the question is why does this oxygen crisis start to develop there? And there you have the so-called taut band, which is a larger area of stiffness increase. And there we are looking most likely at a stiffness increase in the perimysium, in the intramuscular fascial tissue. But we haven't shown that, we are trying to take some histological sections from horses, because there you can analyze the trigger points and take them out an hour later and we cannot do that with humans.

Steven Bruce
Right. Well, interestingly, we had a session with Dr. Robert Gerwin, some weeks ago now, and he's done some very, very recent research into the existence and nature of trigger points. Worth looking up on the website, if you have time. Robert, Nick has asked whether your technique of asking the client to press back towards you is part of a biofeedback mechanism.

Dr. Robert Schleip
That's a very nice way to reflect about it. Yeah. But it's not only asking him, do you feel the difference? You also have to give the client feedback. So, it means you have to use your voice and also your touch. So, when

the client comes towards you more refined than two minutes ago, so you touch them lateral of L4 and before they came back with the whole lower back, but now they come back with a more refined area. If you then are silent, you miss a point. But if without out a second delay, you say nice, wonderful or you whisper, yes, that's very nice. Then they have the feedback. But if you are just using your hand and you're daydreaming at the same time as the therapist, which I sometimes do, but I don't like it, you're missing a point. So, biofeedback means you give them feedback, where they didn't have it before.

Steven Bruce
I'm rushing through this because of course, we are running short of time already. Mike has asked whether what you've described would be applicable to treating people with thickened fascia and he cites eosinophilic fasciitis.

Dr. Robert Schleip
I have never had a case of that, and I'm looking forward. The university knows that when they have a patient, they should be asking me. Yeah, so they are some conditions where the fascia is really thick and really stiff.

Steven Bruce
Mike, if you have a patient with this.

Dr. Robert Schleip
Call me! Call me! So, then the question is, can we make the stiff fascia less stiff? And and I would start with the hyaluronan but after a few months, usually two to three months is necessary to change the fibrous geometry of collagen fibers. So, then I would hope but hoping means not knowing that you would also be able to change the stiffness not only of the hyaluronan, but also of the fibrous matrix.

Steven Bruce
Thank you. We had a speaker on Tuesday evening, Dr. Anne Jensen, who's a chiropractor practicing in Australia. And she was talking about emotional components in physical pain and dysfunction. And she said that there is research or there is a theory that long term memory might be stored in fascia, is that something that you're aware of?

Dr. Robert Schleip
The question is, what do you mean with memory? The key to memorizing, it can definitely be stored, just like scar tissue. And that has been shown though, after you are injured, not only is your architecture changed for years afterwards, and then when you look at the sky and you feel the scar, the memory comes up. So the peripheral tissue can be as much a key as if you hear a sound or get a taste again, that you smell the last timed 20 years ago and the memory comes up. But then the photograph or the taste that you have, when you hear the sound of the door at your grandmother's house is not the storing of the memory. It's the key to elicit the memory, which is stored in your brain and the central nervous system. And that is a much more simple explanation. Why people when you work around an injury site, suddenly they remember something

where they didn't have access for the last 30 years. But in terms of state dependent memory, the storage is still in the brain. But the key is hidden in the fascia and you give them the key to that.

Steven Bruce
Is that perhaps through some nociceptive feedback to the brain?

Dr. Robert Schleip
Yeah, another one is a chemical condition there. NGF, neurotrophic growth factor, my colleague, Professor Mensa, he has injected it into himself. And that is huge and I would love to do the same. Because that is usually expressed if you have an injury, not only if the first time, but a second time. So, if you get a drastic injury, then you don't have so much NGF. But within one or two weeks, you get a ridiculous reinjury again, and then you have this memory effect, because the body then expresses neurotrophic growth factor, which is very beneficial if you're a child and you want your nerves to grow. But it makes you very much pain sensitive. So, if you have NGF in your jaw, even yawning is painful to you. And that stays for weeks within the tissue. So that is definitely a chemical condition that you have if you have a repeated injury condition in the tissue. And then the question is, can we lower the NGF in the tissue? Probably by increasing microcirculation, so with lymph drainage or with going jogging, etc. But that is a very good explanation why even weeks later, ridiculous everyday movements are hurting you. Not because you have more mechanical stretch, but the NGF is lowering the threshold for what feels painful and what does not yet feel painful. So that would be a second biochemical threshold that you can lower in the periphery. And you don't need the central nervous system in order to make that difference.

Steven Bruce
We have made a big mistake getting you on our lunchtime show, I'm afraid, because 45 minutes and certainly 35 minutes isn't enough to discuss fascia with you. And I have so much feedback from the audience saying how much they would like to hear more from you. It is such a delight to talk to somebody who is so enthusiastic and passionate about the topic, quite apart from anything else. But if you could spare the time, I'd love to get you back in because there are still so many questions coming in here. And I know there's so much more you could talk to us about.