IN THE SPOTLIGHT

Prolotherapy and Platelet Rich Plasma Research at Harvard: Interview with Joanne Borg-Stein, MD

Ross A. Hauser, MD & Joanne Borg-Stein, MD

RH: Dr. Borg-Stein, please give our readership an overview of who you are, and your role at Harvard.

JBS: I am on faculty at the Harvard Department of Physical Medicine and Rehab, and also at the Spaulding Rehabilitation Hospital. I have roles as the director of the spine center at Newton Wellesley Hospital and medical director of the Spaulding Rehab center in Wellesley, Massachusetts. Also, I am the team physician for Wellesley College, a division three women's college, with 12 varsity teams. I am also the director of our sports medicine fellowship here at Spaulding and Harvard. I see people that are older, younger, and adolescent, with acute, sub-acute, and chronic musculoskeletal injuries.

RH: In looking at your qualifications and some of the items on the Spaulding Rehab website, it says your research interests include Platelet Rich Plasma, women's sports injuries and prevention, sports medicine, among others. Can you go into detail on how that inspired some of your research interests?

JBS: I'd say about 10-12 years ago, I started getting interested in regenerative medicine and Prolotherapy. I did some training in New England, and at other courses, and started using Prolotherapy as a first regenerative treatment. We are now in the final stages of publishing our research comparing Prolotherapy to corticosteroid injections for chronic lateral elbow pain. We hope to have that in print within the next few months. Our recruitment was not as strong as we wished because a lot of the patients did not want steroids. They did not want to be randomized. We seemed to have a trend toward better outcomes with the Prolotherapy group than the steroid group. That was a few years ago. More recently, over the past two to three years, as I studied musculoskeletal ultrasound and became more familiar and comfortable with that, I started using more Platelet Rich Plasma for treatment of chronic musculoskeletal injuries. Our sports medicine fellow is analyzing our first two years of data. We looked at patients prospectively, and we have outcome measures pre- and post-treatment. We're going to be analyzing them to see how our patients have done with Platelet Rich Plasma. Our next step is to set up some randomized, controlled trials, applying Platelet Rich Plasma to different musculoskeletal diagnoses.

RH: Having done some Platelet Rich Plasma for the last several years, are there certain conditions that you have a sense that this particular type of Prolotherapy works best with?

JBS: We are in a learning curve to try to sort that out. Research thus far is strongest for the use of Platelet Rich Plasma for tendinopathy. This includes the non-insertional tendinopathy, mid-substance tendinopathy, and small partial tears. The applications are expanding as we try to figure out what the physiological effect of PRP may be on ligaments, muscles, joints, arthritis. Currently, the strongest indication is tendinopathies.

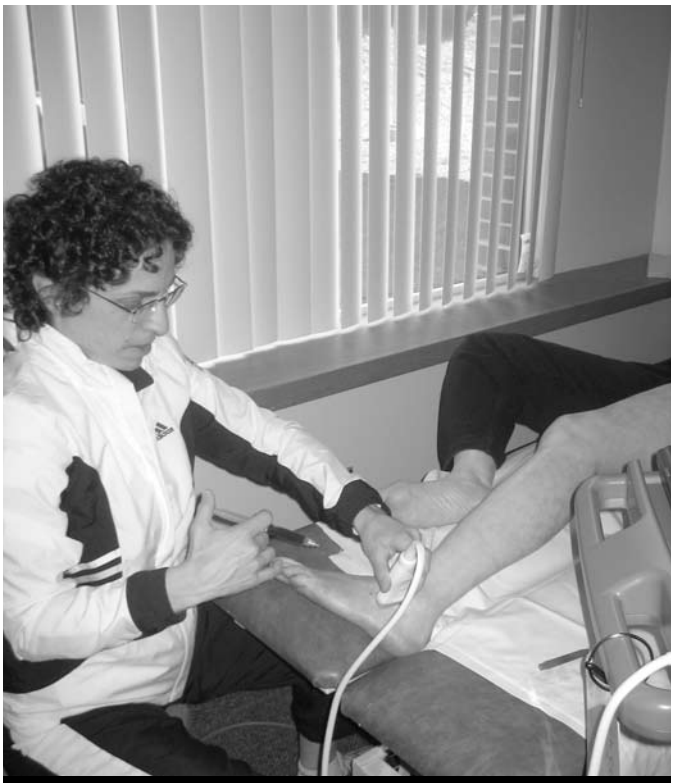
RH: Please elaborate for readers who may not be familiar with the term tendinopathy, versus tendonitis, and tendinosis.

JBS: Sure. Our old thinking was that tendonitis, or inflammation of the tendon, was the pathologic process. We've learned over the last 10 or 12 years that in chronic conditions, overuse, or degenerative change in the substance of the tendon, is not necessarily inflammation around the tendon. So that is why we've had to consider other treatment options that help to restore, regenerate, or help heal these areas. Tendinopathy is just the general term that refers to any disorder of the tendons. There's a spectrum from just some mild thickening, to disruptions of the tendon fibers, to small defects and partial tears in the tendon fibers. We all have to be careful because this is part of wear and tear and aging. We have to make

sure we correlate what we see on ultrasound, MRI, with our physical examination, and the actual pathology. So, tendinopathy is just the term that's describing this generic type of change in the tendon. Tendonitis would be the term that applies to the inflammatory response in the tendon or the surrounding sheath around the tendon.

RH: In your discussion on a lot of the chronic conditions being more degenerative and those situations needing PRP Prolotherapy or traditional Prolotherapy to try to regenerate the structures, are there other modalities that you would prescribe or recommend in those situations?

JBS: Certainly. Those of us who do injections of Prolotherapy or Platelet Rich Plasma injections have treated, or are treating, our patients with a precise physical examination, bio-mechanical assessment and adjustments, and strengthening. We also consider medical, metabolic or nutritional factors. You've got to look at their structure. Patients may have some deformity, leg length discrepancy, weakness, or muscle imbalance. So, injection is just one minor part of the rehabilitation process to try to heal the tissue. The most important being exercise, and all the other factors that we do in rehabilitation.



Dr. Borg-Stein performing a Platelet Rich Plasma (PRP) treatment.

RH: As you discussed, you are a chief of Physical Medicine & Rehabilitation at a teaching hospital and are affiliated with Harvard Medical School. Are you sensing that in the field of Physical Medicine & Rehabilitation, there is more of an openness toward alternative therapies such as Prolotherapy?

JBS: I think that there's a very healthy and appropriate degree of academic skepticism, but willingness to take a look and consider that there may be a valid science behind it. So people are open to hearing about it, but are compelling those of us in the field who are interested in this, to be diligent, to do the controlled trials and understand the basic science and put an evidenced foundation behind the clinical practice.

RH: Okay. You have done a lot of work related to pain and musculoskeletal pain as it relates to pelvic disorders. I was hoping you could elaborate a little on that. What type of disorders do you see, and what type of treatment modalities are helpful for those disorders?

JBS: I do not treat gynecological and pelvic floor pain and incontinence. I really deal more with sports and musculoskeletal injuries around the pelvis. It can be often ligamentous or tendinopathy, sacroiliac, hip girdle, labrum, adductors or groin muscles, lower abdominal muscles and their attachments, and are often associated with kicking sport athletes and are very frequently managed conservatively. Rarely do patients need surgical intervention. So it's something that we can approach like everything else with good analysis of their sport and their bio-mechanics, their muscles and their strength. I personally think it is an area that can respond quite well to regenerative injection treatments, if other treatments fail. I've been most impressed with the research that Topol and Reeves published both in the *Archives of PM&R* and the *American Journal of PM&R* in terms of their outcome, using Prolotherapy for treating kicking sport athletes, rugby soccer players, in South America. They have excellent outcomes with very chronic conditions.

RH: One condition you mention there was hip or labral issues. Do you find that is a condition that responds to regenerative injection therapy?

JBS: I don't know yet. The hip girdle is complicated. Often times labral tears are incidental radiographic finding and not the proximate cause of pain. I think we

need to be diligent and careful in our physical examination and assessment of the hip girdle: anteriorly, laterally and posteriorly. I don't think there is any data yet, and certainly no radiographic data and pre- and post- studies, looking at what happens to the torn labrum if one gets regenerative injections.

RH: Another condition you seem to have a research interest in revolves around cervicogenic disorders. You had co-authored some papers and discussions. I was hoping you could elaborate on that subject.

JBS: Something I was doing more active research 10-15 years ago. Although I continue that in clinical care, I have not really committed any research time to that in a decade or so. I think local trigger point and regenerative-type injections can be helpful in some of the soft tissue musculoskeletal conditions in and around the neck scapula, and shoulder girdle. But we haven't really done any research pertaining to Prolotherapy and vertigo, per se.

RH: Do you teach residents?

JBS: We have a full time PM&R resident and a PM&R sports medicine fellow that I teach.

RH: If you were talking to them about how to document results with regenerative injection therapy, what type of advice would you give them?

JBS: You want to get important information about a patient's functional status. Look at what they were able to do beforehand and what they were able to do after. Certainly would like to know their pain rating and pain score as well. So both functional outcome measures and pain rating measures would be important.

RH: Is there anything else you want to tell me that you think would be important about your particular interests or things that you've seen?

JBS: I think that with rehabilitation medicine and the management of soft tissue injuries that we do, this could present an opportunity to get people better in ways that we haven't before. That said, there is a temptation when there is a new treatment to make generalizations and conclusions without supporting it with appropriate research. I think that's our call for the future. To think about and be leaders in the science and clinical outcomes, to give people studies that can give this a strong academic basis, so that people will continue to do it, support it, and add it to their treatment regimen. I had the opportunity to set up a task force in the American Academy of PM&R for research in Platelet Rich Plasma in which we're trying to get a collaborative effort between different centers across the country and different practitioners that have an interest in it. Hopefully we can really do a good job. I hope soon you will see a review article that we put together going over all the literature, both in animal and in human models, summarizing what we know in regenerative biology as it applies to sports injuries and musculoskeletal injuries. I'm hoping that will give us all the background that we need to go forward and do good science. ■