

INTERVIEW

Advancing Patient Care in Vertebral Metastases: Dr. Jason Levy on the Role of Percutaneous Ablation

[Jason Levy, MD, FSIR](#)

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Jason Levy, MD, FSIR, an interventional radiologist with a special focus on interventional oncology from Northside Radiology Associates in Atlanta, Georgia, recently sat down with *Vascular Disease Management* to discuss the clinical considerations, procedural techniques, and ongoing evidence in the use of percutaneous ablation for treating vertebral metastases. Click [here](#) to see a video of this interview.

What are the most important clinical and anatomical factors you consider when selecting patients for percutaneous ablation of vertebral metastases vs, or as a supplement to, other treatment modalities?

The most important factor is not necessarily an imaging factor, but it is a clinical factor. Especially when you are talking about the spine, what we are doing is trying to treat the pain and trying to keep their performance status adequate so they can get systemic therapy.

What happens is when we are evaluating these patients, a lot of people focus on the imaging such as a blown-out posterior wall, or involvement of the epidural space. But those are not necessarily truly contraindications to treating vertebral metastases.

However, clinically, when a patient is complaining of new onset bowel control loss or bladder control loss, or obviously new onset weakness, those are signs of cord-impending injury or significant nerve-impending injury. And then, obviously, when you get down into the sacrum and you are treating levels in the sacrum, you may be looking at foot drop or other symptoms such as that. But, again, what is a contraindication is treating somebody with a clinical sign of cord or significant nerve damage, and that may be appropriate in small subsets of patients, but in general that is the key element rather than the imaging.

Could you provide a brief overview of the various ablation modalities currently used for vertebral metastases and explain how patient-specific factors influence the choice of one technique over another?

Similar to the last answer is part of what we are doing is pain relief, but part of what we are doing is helping avoid skeletal-related events. Basically, a skeletal-related event is a major neurologic injury or a fracture of a bone. So those things may have happened already. Hopefully they haven't. But what we have seen in almost every prospective series of ablation is that most of these get combined with PMMA cement so we are helping give some structure to the bone, giving some axial loading protection and avoiding future fractures. In addition, nerve injury is exceedingly low in essentially every prospective study done on any ablative therapy.

Now, I am answering that in sort of a circuitous way, because in general, most of the time in the spine we are dealing with bones that have axial weight loading, so the force is going to be on the vertebral body from an axial, so from a cranial caudal dimension, more often on the anterior aspect, but it depends on where the metastasis is. So, because the axial loading is so important, we know that cement does exceedingly well in avoiding fractures with axial loading. Cement tends to be the most commonly utilized device to get a structural integrity of the vertebral body after ablation. When using cement, it is far easier to use cement in a heat-based therapy, such as radiofrequency ablation or microwave, than it is to do in a cool-based therapy, because cement sets in hotter temperatures. So theoretically, with a cool-based, ablative modality, you may have less good cement fill.

We do not have bad data with cryo, but if you look at almost every prospective study done on cryo, such as the more recent MOTION trial by Jack Jennings, you see that only about 4 or 5 out of 66 patients were actually in the spine, so it is less frequently used. Radiofrequency energy is going to be far and away the most commonly used because it is fairly predictable, controlled, and probably has a higher safety profile. So of those 3 modalities, it is going to be radiofrequency ablation that is the most commonly used.

Now, most of the intent of vertebral body metastasis is going to be in a palliative setting. When we are talking about vertebral ablation for local control, then you may be more prone to be using cryoablation because you have the potential to see where your ablation zone is in real-time, and equally important you can get larger volumes of ablative tissue. Now, that is usually combined with some sort of neuromodulation, sensory or motor neuromodulation to make sure that you are still maintaining a safety profile. But since 99% of what we see in the real world is going to be palliative, it is radiofrequency ablation.

What recent advancements have you found to be particularly impactful on procedural accuracy and patient safety?

There have not been tremendous advancements in the last 2 or 3 years. People are starting to use robots so you can improve your guidance. I think there is definitely a push to try this. From what I have seen, it seems to be a very exciting new modality to help you theoretically reduce radiation time during the procedure and get an accurate placement for your needle position. I think that has an exciting future. It has not necessarily had widespread use yet, but certainly has a very interesting, potentially high future utilization, and potentially could change the market and make our procedures safer.

What are some of the most significant challenges or controversies in this space and how do you mitigate them in your practice?

There's definitely a fair number of controversies in treating these, although some of this ends up being more of what, unfortunately, can be a turf war problem rather than a patient care problem. This has definitely improved over the last 3 or 4 years. I think part of that is it is really impossible to ignore the data that we see coming out in essentially every prospective trial done on spinal ablation and every meta-analysis that is done in a retrospective fashion. We just continue to see the same results with over 80%, 85% of patients getting pain relief, the pain relief is within 3 days. The future fracture risk is essentially almost always eliminated. Neurologic events are exceedingly rare. So, it makes it very hard to ignore. I think the biggest controversy really is radiation oncology vs interventional radiology and who treats the patient. But the reality is that this really is perfect grounds for collaboration between the 2 societies, and I think that is increasing now and it will continue to increase in the future. In the rare studies that we have seen the 2 combined, the results really are unmatched when you look at one or the other as a standalone therapy. So I think that that has been probably the biggest challenge to growth and the biggest sort of controversy. Having said that, some of the advantages we see with ablation and cement can serve to help with the disadvantages of radiation, and vice versa.

How would you characterize the current level of evidence supporting percutaneous ablation in the management of vertebral metastases and where do you see the most pressing gaps in research or clinical guidance?

The data in prospective trials are great. We have not had a randomized, phase 3 trial comparing this vs radiation. I don't think that will ever get done. But I do think, and frankly, I think the NCCN, the National Cancer Guidelines, recognize this therapy. In 2025, it is now listed, both vertebral ablation and cement are listed in spine algorithms and they are listed in the adult cancer pain guidelines. So the evidence is there for the combination of ablation and cement in the spine.

As for the future evidence, just a plug to our future trial through the SIO: we are doing the Tribute trial, which is not exclusive to the spine, it is going to include peripheral bones, the spine, and the pelvis as well—you are basically going to use a percutaneous ablation modality such as cryo microwave or RFA. If you choose to use cement or an implant after, you can do that, and that is to be either followed or preceded by some form of radiation. We are going to look at everything from pain scores to complications, to opiate-equivalent usage in these patients, and get a good follow-up with the combination of therapy. And I think that is probably our current biggest gap, is the lack of bigger prospective studies combining the two. ■