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ISM I

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## Investigating Bone Metastases through the Lens of Interventional Oncology

### Assessment 11 - Research

**Date:** 7 January 2021

**Subject:** Interventional Radiology

#### **MLA 8 Citations:**

Cazzato, Roberto Luigi, et al. "Percutaneous Consolidation of Bone Metastases: Strategies and Techniques." *Insights into Imaging*, Springer Berlin Heidelberg, 6 Feb. 2019, [www.ncbi.nlm.nih.gov/pmc/articles/PMC6365313/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC6365313/).

#### **Assessment:**

One of the goals for the spring semester research was to dive deeper into the field of interventional oncology, which is a subspecialty of interventional radiology. Cancer in general has always been a strong interest, so the avenue of interventional oncology will be explored for a decent portion of this semester's research. This article covered percutaneous treatment of bone metastases, which was a topic explored in a previous assessment and it will be explored in-depth throughout this assessment.

The main goal of this assessment was to advance my knowledge of this topic and to dive in-depth into the bone metastases disease, which was a topic of interest last semester. Lots of terminology was learned, which greatly assisted with the understanding of the topic. Some of the

new terminology acquired were the treatment options, osteoplasty and osteosynthesis, as well as skeletal-related events and some common medical terminology, such as radial, axial, and secondary. This terminology was essential for understanding the detailed content of the article, and it can be useful in future research, especially the common medical terminology since those terms/word stems are used in almost every field of medicine and are extremely useful to know. Additionally, the exact procedures by which the treatment options were conducted was learned. This knowledge will be helpful for design adjustments in the final product, but more details on that will be discussed later in this assessment. Furthermore, many trends in the field of interventional radiology were observed. This article noted that interventional radiology procedure alternatives are becoming gradually more popular than traditional surgical procedures, which is really promising since it shows that interventional radiology is on the rise; it is not fading away like some professions. For example, the article said that these percutaneous techniques are increasingly being used to treat bone metastases as opposed to surgical procedures, demonstrating that interventional radiology is trending up. Another trend that the article noted was the trend in using image-guided techniques such as CT and fluoroscopy in order to increase the success rates of the percutaneous techniques used to treat bone metastases. This same trend was also noted in previous articles that were assessed.

Another goal for this assessment was to process how this article affected my overall understanding of the topic of interventional oncology and how it fits into interventional radiology as a whole. Some information that I found surprising was that bone necrosis and secondary fractures can still occur even after treatment. Also, some treatments for cancer can end up causing bone metastases, which is something that I found incredibly surprising. Interventional radiologists can end up cleaning up some effects that patients get from other procedures. Another

surprising fact that I learned was the fact that, in order to qualify for an interventional treatment for bone metastases, the patient's life expectancy needs to be more than 1 month, or else they will not receive that specific treatment. It is sort of understandable, since performing a large and expensive procedure on a patient that only has a month to live might be a waste of resources, but I still believe that those patients should still get the treatment in order to make their last month of living as comfortable as possible. It is sort of a 'grey-area' topic where it is sort of difficult to find the balance between morals and resource usage. Another surprise was the fact that two different interventional procedures can be conducted in the same session, as a complement to one another. This was seen in the article where it mentioned combining percutaneous consolidation with ablative therapy in the same interventional session. That topic of combining procedures into the same session is also an avenue worth exploring in future research. Additionally, some connections to past knowledge were made, such as the trend of technology increasingly being used in interventional radiology, as well as the fact that many interventional alternatives to surgical procedures are rising in popularity. Also, the article mentioned Mirels score, which was a new term learned in a previous assessment and was useful to know when reading this article. It also mentioned treatments done on bone metastases with long bones, which was one of the topics explored in a previous assessment, and also the reason why bone metastases became a topic of interest. A couple of questions also arose when reading the article. One of them was about self-drilling and self-tapping screws, which were mentioned in the article. I was just curious about how that could work. It certainly is a question worth asking my mentor about. Another question was: are certain techniques used over a wide variety of procedures? Some digging through interview notes was able to solve that question, since Dr. Chen had said that many procedures require the same techniques.

The last goal for this assessment was to think about potential avenues for future study that could come from this article as well as finding uses in the final product. Some topics that were noted were Kirschner wire deployment, selection of the percutaneous consolidative technique and how that decision is made, more about Mirels score, and tumor debulking. It is also a goal to ask my mentor in the future about the reason why patients with low life expectancies are not given certain procedures and if that could change in the future. The Kirschner wire deployment stood out because the article said that multiple experienced surgeons and advanced image-guiding technology is needed to perform that part of the procedure. The fact that it takes extra manpower and technology was extremely interesting and future research in that topic will be a goal for the semester. Also, the selection of the percutaneous technique (osteosynthesis vs. osteoplasty) was interesting because the article discussed it in good detail, but it still left me with some questions about the differences and how the decision is made on which treatment to give the patient. A specific question on that topic is, is the decision made on a case-by-case situation? Lastly, uses for the final product were looked for in this article. The final product is mostly focused on procedures using tubes, but I can ask my mentor about exploring uses for the final product in non-tube techniques. Additionally, an electric drill or an injection attachment can be added.

Overall, this assessment was extremely successful in accomplishing all of the preset goals. Many surprising facts were learned and many questions arose. It required much thought to process and it was a great way to start researching for the spring semester. Future research will be guided by the avenues discovered in this assessment and it will be centered around the topic of interventional oncology.

**Notes:**

[Percutaneous consolidation of bone metastases: strategies and techniques](#)