

## Treatment of Spinal Osteolytic Lesions Pain in Multiple Myeloma Patients

**Panagiotis Korovessis MD, PhD\***

*Department of Orthopaedic, General Hospital of Patras, Greece*

**\*Corresponding Author:** Panagiotis Korovessis MD, PhD, Department of Orthopaedic, General Hospital of Patras, Greece.

**Received:** October 22, 2016; **Published:** November 05, 2016

Recent advances in treatment of Multiple Myeloma (MM) include autologous stem cell transplantation, radiotherapy, chemotherapy, and surgery. With these advances the survival of MM patients is increasing with reported survival rates even more than 10 years. Symptomatic spinal involvement (osteolyses, fractures) including pain or even neurologic impairment ranges from 34 - 64% of the MM patients. Contemporary surgical techniques combined with medical treatment for treatment for osteolytic painful vertebral lesions was proved to be a reliable and valuable treatment method increasing not only pain but life expectancy as well.

MM patients is the most common primary hemopoetic tumor with localization in the skeleton, predominately in the vertebral bodies and less commonly in the posterior spinal elements. Myeloma bone disease is due to the over expression of Receptor Activator for Nuclear Factor  $\kappa$  B Ligand (RANKL) by bone marrow stroma. RANKL activates osteoclasts, which resorb bone. The resultant bone lesions are lytic skeletal osteolytic lesions associated with MM patients is the most frequent cause of morbidity and mortality in patients affected by this pathology [1]. Survival after MM is highly variable; however, recent studies of various drug therapies have led to promising outcomes and reported survival beyond 10 years [2]. The reported survival rate of MM patients is much better than for patients with metastatic bone disease. This accounts for the fact that in myeloma patients with associated orthopaedic problems requiring surgery, a treatment option should be chosen that consists of an adequate reconstruction of the osteolytic bone defects. Bone pain affects almost 70% of patients and is the most common symptom.

Spinal involvement can be the initial clinical presentation of the disease, leading often to intractable pain and/or neurological complications [3,4] while in the one third of the patients, MM is diagnosed after a pathologic spinal fracture occurs [5]. New vertebral body fractures occur in approximately 15 - 30% of patients with MM annually [1]. Vertebral Compression Fractures (VCF), reduce space in the chest and abdominal cavities, while they may reduce lung capacity and cause loss of appetite. Consequently, they have a significant impact on the quality of MM patient's life.

Contemporary therapeutic approaches, such as autologous stem cell transplantation Radiotherapy and chemotherapy, radiation and surgery in certain cases, helps towards lessening the occurrence and severity of adverse effects of this disease, as well as managing associated complications [6-8].

After VCFs, the goals of surgical intervention are pain relief and fracture stabilization. Vertebroplasty (VP) and Balloon kyphoplasty (BK) with PMMA, decompression, pedicle screw fixation etc. and eventually radiofrequency have been introduced to improve quality of life and reduce pain in MM patients suffering from osteolytic VCFs. Owing to the risk of vertebral instability, decompressive laminectomy alone is not indicated [9]. Potential for pulmonary and neurological complications in MM resulting from PMMA leakage during VP remains a concern ranging from 1%- 48%, while it is less common in BK < 2% [10-13].

The high benefit of surgery for patients with MM was previously shown to be the low post-surgical complication rate (8%) [9], that is lower than that reported for patients with vertebral metastases following surgery (19%) [14]. Even with an anterior-posterior approach, a complete resection in the vertebral column is not possible and is contraindicated for patients with a poor health status. In any case, radiation therapy for residual tumour following incomplete resection is performed, as the vertebral column is the location mostly affected by local recurrences.

In MM patients with neurologic impairment due to epidural compression by the myeloma itself without structural deficiency of the vertebral body, radiation is often able to diminish the local tumor lesion and the associated axial pain. However, radiation therapy alone cannot treat the instability induced by vertebral body osteolysis and associated pathological fractures. Spinal instability and axial spinal pain are quite often present (75%) in MM patients [15]. Spinal instability resulted from vertebral body osteolysis requires mechanical stabilization to reduce axial pain and simultaneously to prevent potentially secondary neurological impairment due to spinal cord and cauda compression.

Surgical treatment is performed-if possible-before spine irradiation or chemotherapy to decrease any local or systemic complications. Postoperative irradiation and chemotherapy was always followed the successful wound healing, usually 3 - 4 weeks following uneventful surgery.

## Conclusion

Contemporary surgical techniques (kyphoplasty, vertebroplasty, hybrid fixation etc.) combined with medical treatment and radiotherapy in the treatment for symptomatic osteolytic painful vertebral lesions in Myeloma patients are nowadays reliable and valuable treatment methods that contribute not only to increasing ton only pain but life expectancy as well.

## Bibliography

1. Coleman R E. "Clinical features of metastatic bone disease and risk of skeletal morbidity". *Clinical cancer research: an official journal of the American Association for Cancer Research* 12.20 Pt 2 (2006): 6243s-6249s.
2. Barlogie B., *et al.* "Treatment of multiple myeloma". *Blood* 103.1 (2004): 20-32.
3. Mundy G R. "Myeloma bone disease". *European journal of cancer (Oxford, England: 1990)* 34.2 (1998): 246-251.
4. Cortet B., *et al.* "Percutaneous vertebroplasty in patients with osteolytic metastases or multiple myeloma". *Revue du rhumatisme (English ed.)* 64.3 (1997): 177-183.
5. Weinstein J N and McLain R F. "Primary tumors of the spine". *Spine* 12.9 (1987): 843-851.
6. Ocio EM., *et al.* "New drugs in multiple myeloma: mechanisms of action and phase I/II clinical findings". *The lancet oncology* 9.12 (2008): 1157-1165.
7. Palumbo A and S V Rajkumar. "Treatment of newly diagnosed myeloma". *Leukemia* 23.3 (2009): 449-456.
8. Bensinger WI. "Role of autologous and allogeneic stem cell transplantation in myeloma". *Leukemia* 23.3 (2009): 442-448.
9. Zeifang F., *et al.* "Long-term survival after surgical intervention for bone disease in multiple myeloma". *Annals of Oncology* 16.2 (2005): 222-227.
10. Hadjipavlou A G., *et al.* "Percutaneous vertebroplasty and balloon kyphoplasty for the treatment of osteoporotic vertebral compression fractures and osteolytic tumours". *Journal of Bone and Joint Surgery British* 87.12 (2005): 1595-1604.
11. Dudeny S., *et al.* "Kyphoplasty in the treatment of osteolytic vertebral compression fractures as a result of multiple myeloma". *Journal of Clinical Oncology* 20.9 (2002): 2382-2387.
12. Fourny DR., *et al.* "Percutaneous vertebroplasty and kyphoplasty for painful vertebral body fractures in cancer patients". *Journal of Neurosurgery* 98 (2003): 21-30.

13. Choe DH., *et al.* "Pulmonary embolism of polymethyl methacrylate during percutaneous vertebroplasty and kyphoplasty". *AJR American Journal of Roentgenology* 183.4 (2004): 1097 -1102.
14. Pascal-Moussellard H., *et al.* "Complications of vertebral metastasis surgery". *European Spine Journal* 7.6 (1998): 438-444.
15. Body JJ. "Effectiveness and cost of bisphosphonate therapy in tumor bone disease". *Cancer* 97.3 (2003): 859-865.

**Volume 4 Issue 4 November 2016**

**© All rights reserved by Panagiotis Korovessis MD, PhD.**