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Infrared thermographic evaluation of patients with metastatic vertebral fractures after combined minimal invasive surgical treatment

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Abstract

Background: Vertebral cement augmentation and external beam radiotherapy have become increasingly used techniques for treatment of vertebral compression fractures due to spinal metastatic lesions in the Republic of Moldova. Surgically, the goal of vertebral cement augmentation is to improve the strength and stability of the injured vertebrae, as well as local tumor control. External beam radiotherapy for suppressing tumor or inducing pain relief are performed immediately after vertebral cement augmentation. Usually, local tumor control is occurred by CT or MRI studies. We have studied through the infrared thermography the dynamics of temperature gradient of tumoral foci skin projection.

Material and methods: The purpose of this study is to evaluate the local tumoral control, analyzing the infrared thermographic examinations in 33 patients with uncomplicated metastatic vertebral fractures, undergoing combined method of treatment (vertebral cement augmentation + external beam radiotherapy), before the treatment and at 12 months follow-up.

Results: We observed an indirect tumor "thermographic field" decrease registered by temperature gradient decrease from an average of 2.03±0.24°C in preoperatively to 1.28±0.33°C at 12 months postoperatively follow-up.

Conclusions: Combined method of stabilization (vertebral cement augmentation + external beam radiotherapy) in patients with uncomplicated metastatic vertebral fractures is effective in minimal invasive surgery and offering local tumor control.

Key words: spinal metastases, pathological fractures, vertebral cement augmentation, radiotherapy, infrared thermography.