

PREVENTION OF HETEROTOPIC BONE

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Replacement of the hip joint is becoming an increasingly common occurrence. Unfortunately, after the surgery it is not unusual that bone develops in the joint space between the pelvis and the femur or leg bone. This bony growth can cause not only pain but limit the motion of the joint. In certain occasions, repeated operations are necessary to remove this ossified or bony tissue.

The cause of the ossification is unclear but thought to be due to primitive cells stimulated by trauma that then become active and generate into bone growing cells or osteoblastic cells which produce bone tissue. This ossification occurs in varying proportions of patient depending on the risks and generally quoted anywhere from 10% to 90%.

Variety of treatments have been attempted to prevent this ossification process. They have included the so-called non-steroidal anti-inflammatory drugs while other centers have used post-operative radiation.

Until a recent German study by Kolbl et al was published in the International Journal of Radiation, Oncology, Biology and Physics there was no randomized study evaluating these two treatment options.

From Wurtzburg, Germany, came this first of a kind study evaluating 401 patients receiving hip joints. Most were needed because of degenerative changes in the joint. The average age of patients undergoing this procedure was 65.9 years and 44 had prior hip surgery on that same side.

Patients were randomly allocated to one of three treatments. The first group received 100mg (milligrams) Indometacin daily for seven days, starting on the first post-operative day. This is a non-steroidal anti-inflammatory drug.

The second group received post-operative radiation with a dose of 700 rads (a measurement of radiation) administered within four days after surgery and the third group received a single dose of 500 rad within four days after surgery.

Post-operative pain was treated by drugs other than non-steroidal anti-inflammatories. Patients previously treated in the same hospital were considered the historic control group. Treatment results were determined by x-rays taken immediately after surgery and as well 12 months later. Four experts evaluated each case.

The researchers found that all prophylactically treated patients had a lower incidence of heterotopic ossification than in untreated historic control groups.

The patients who were treated with 700 rad (radiation dose) or non-steroidal anti-inflammatories developed less heterotopic ossification than patients who received the 500 rad treatment arm.

When concerning heterotopic ossification which can result in functional impairment, the authors noted "The incidence of heterotopic ossification was significantly less in the group irradiated with 700 rad than treated with Indometacin." This was an important statistical observation.

There are, indeed, other risk factors for developing this undesired outcome of surgery and they include prior surgeries, a history of hypertrophic osteoarthritis, ankylosing spondylitis, diffuse idiopathic skeletal hyperostosis, and extensive hip trauma.

It is known that the risk of ossification can be as much as four times greater in those who have had risk factors than those without. But, in fact, as noted by the authors, "On an absolute scale considerably more patients without risk factors develop heterotopic ossification because the number of patients with risk factors is low compared to all patients receiving total hip replacement. In this respect, prophylactic treatment after total hip replacement seems advocated for all patients."

The authors concluded that, "early post-operative irradiation with the single 700 rad fraction is the most effective therapy to avoid heterotopic ossification after hip replacement. It is more effective than 500 rad fraction or using Indometacin."

This study should help guide patients and orthopedic surgeons in producing the best possible outcome for those patients undergoing hip replacement to seek to avoid this known complicating event.

It is good to know that a post-operative complication can be so easily reduced in frequency and physical function may show improvement.

We use radiation at Radiosurgery New York to help protect patients from heterotopic bone. Heterotopic bone is a major quality of life issue. Studies have shown an improvement in mobility of the hip joint after radiation. Radiation must be implemented early and it requires good coordination between the orthopedic surgeon and radiation doctors.

We encourage your calls about treatment options. You can call us at 212-CHOICES or e-mail questions to gil.lederman@rsny.org.