Computer Assisted Cryotherapy in prophylaxis for heterotopic calcifications in Total Hip Arthroplasty

Raffaella Alonzo, Veronica Giuliani, Ilaria Nicolosi[1], Stefania De Sanctis, Silvia Frontini, Carmelo D'Arrigo
[1]La Sapienza

INTRODUCTION:
Despite the improvement of surgical techniques in access for hip replacement and in pharmacology, Heterotopic Ossification (HO) after total hip arthroplasty is a common complication occurring in 16%-53% of osteoarthritis (OA) patients undergoing THA, and severe amounts of ectopic calcifications can limit range of motion or cause severe pain. The aim of this study was to evaluate the efficacy and safety of CAC in controlling ectopic calcification formation post-PTA.
METHODS: Patients undergoing THA between July 2020 and April 2024 were prospectively enrolled and randomly assigned in three Groups. Inclusion criteria were primary total hip replacement due to painful OA, compliance to prescriptions and follow - up, male sex and hypertrophic OA. Exclusion criteria were revision THA, hip infection, ROM deficit (Pre or post operative? Why?). All patient received direct lateral approach performed by the same surgeon. Group I received a CAC protocol (two 3 – hours applications daily at a temperature of 10-12°C and intermittent compression up to 50 mmhg.), group II received NSAID prophylaxis with indomethacin 1 mg per kg during first 15 post-operative days and group III was not treated for the prevention of postoperative HO. Heterotopic calcifications were evaluated by a single independent observer on plain X rays at 1 e 3 months postoperatively. P value was considered statistically significant at $p<0.01$.
RESULTS: 216 consecutive patients were eligible for enrollment. (Group I: 108 patients; Group II: 108 patients, group III: 50 Patients). When comparing the Groups a significant difference ($p<0.01$) was found with better ROM and lower grade heterotopic calcification in the CAC group. Radiological evaluation and grading with Brooker classification at 1 month showed respectively four grade 1 and three grade 2 calcifications in group I, five grade 1 calcifications, Three grade 2 and two grade 3 calcifications in group 2; one grade 4 calcification 3 months post operatively was registered in group II. Group III showned results comparable to those of the patients treated with indomethacin at the control in the first month, however showing three garde 3 and two grade 4 lesions at 3 months. Despite better radiological results in Group II no statistically significant differences were registered between group II and group III.
DISCUSSION AND CONCLUSION:
Irradiation after surgery could decrease the incidence of HO. However, high costs and the risk of soft tissue sarcoma inhibit the use of irradiation. Increasing evidence showed that nonsteroidal anti- inflammatory drugs (NSAIDs) are effective for the prevention of HO. Therefore, NSAIDs have been widely used for the prophylaxis of HO. However, the risk of gastrointestinal side effects caused by NSAIDs has drawn the attention of surgeons. Postoperative computer assisted cryotherapy (CAC) is effective in terms of ossification control, moreover the procedure seems to be safe with no adverse effect registered in our series and effective in primary THA resulting in reduced HO. CAC is well tolerated improving patients satisfaction. We can speculate that this protocol could potentially improve post operative rehabilitation and final outcomes.