Prospective Evaluation of Safety and Efficacy of Radioactive Synovectomy with ^{90}Yttrium-Hidroxyapatite and ^{153}Samarium-Hidroxyapatite in Chronic Hemophilic Synovitis

Janaina Bosso José da Silva[1], Rodrigo Gonçalves Pagnano[1], Tânia Sasasaki[2], Emerson Taro Inoue Sakuma[3], Marcia Aparecida Picoloto Matta[1], Francisco Cintra[1], Celso Darío Ramos[2], Marina Pereira Colella[1], Allan de Oliveira Santos[2], Erich Vinicius De Paula[1], Margareth Castro Ozelo[1]

[1]Hemophilia Unit "Cláudio L. P. Correa" – INCT do Sangue Hemocentro UNICAMP, University of Campinas – Campinas, SP, Brazil;

[2]Division of Nuclear Medicine, School of Medical Sciences, University of Campinas, UNICAMP, Campinas, Brazil; [3]Department of Radiology, FCM UNICAMP, University of Campinas, Campinas, Brazil.

INTRODUCTION

In countries where primary prophylaxis is not a widely available, the radioactive synovectomy (RS) is sometimes the best treatment option for patients who develop chronic synovitis.

OBJECTIVES

The aim of this study is to evaluate the efficacy and safety of radioactive synovectomy with ^{90}Yttrium-hydroxyapatite (^{90}Y-HA) and ^{153}Samarium-hydroxyapatite (^{153}Sm-HA) in the treatment of hemophilic arthropathy.

METHODOLOGY

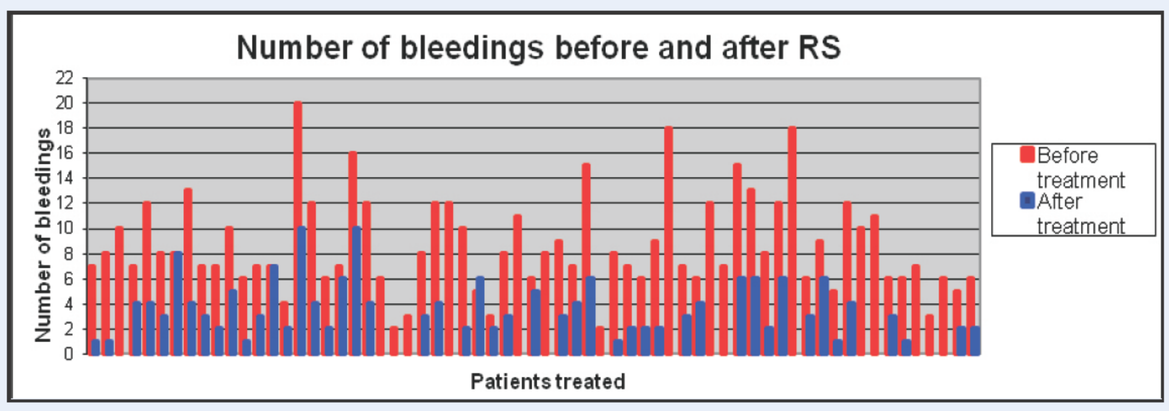
Eligibility criteria included the diagnosis of hemophilia and signs of synovitis. Efficacy was determined by comparing the frequency of bleeding episodes in the treated joint, 6 months before and after RS. Safety was analyzed for the presence of adverse events and extravasation of the radiopharmaceutical. All patients underwent three-phase bone scintigraphy before (Figure 1), after 72 hours (Figure 2) and 6 months after the procedure (Figure 3).

RESULTS

65 joints (50 patients) underwent RS. Thirty-eight joints (33 knees and 5 ankles) were treated with ^{90}Y-HA and twenty-seven joints (1 knee, 19 elbow and 7 ankles) were treated with ^{153}Sm-HA. At the 6 month follow up, it was observed that the frequency of joint bleeds in the treated joint decreased from 1.44 ± 0.64 per month (range of 0.33 to 3.33) to 0.45 ± 0.41 per month (0 to 1.67) ($p < 0.0001$, paired Wilcoxon) (Graphic 1).

The reduction of episodes of haemarthrosis in the whole group resulted in a potential cost reduction in the use of clotting factor of 1,084,950 IU, equivalent to US$ 220,000 (1IU ≥ US$ 0,28) during the period of 6 months follow-up.

Adverse events included transient synovitis worsening in the first 14 weeks after treatment in treated joints (12%), among these, 5 patients treated with ^{90}Y-HA and 9 patients treated with ^{153}Sm-HA. One patient that received ^{153}Sm-HA presented extra-articular leakage in the lungs without evidence of clinical change.



Graphic 1: Number of bleedings before and after Radioactive Synovectomy.

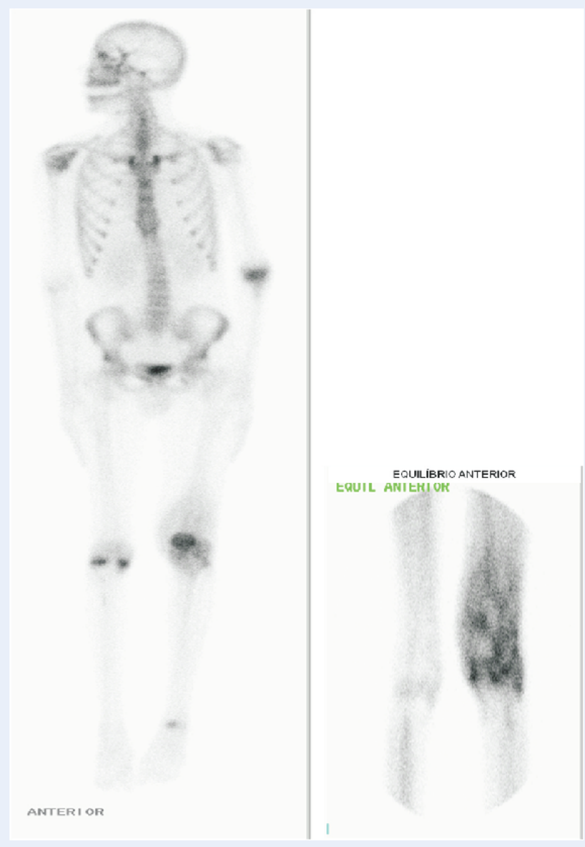


Figura 1: Pre-treatment bone scan showing increased flow in the left knee.

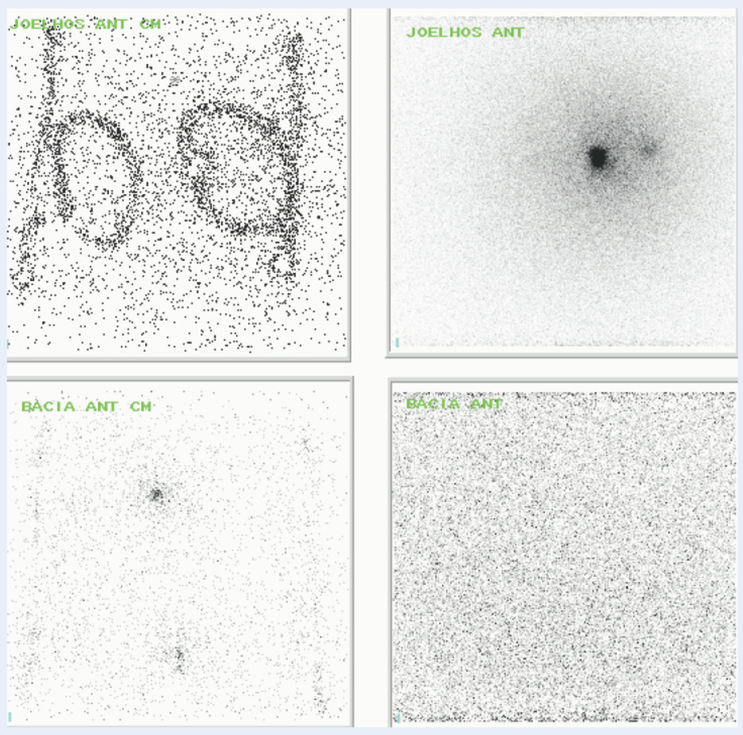


Figure 2: Control images 72 hours after RSO showing localized distribution of the radiotracer into the joint with no signs of extra-articular leakage.

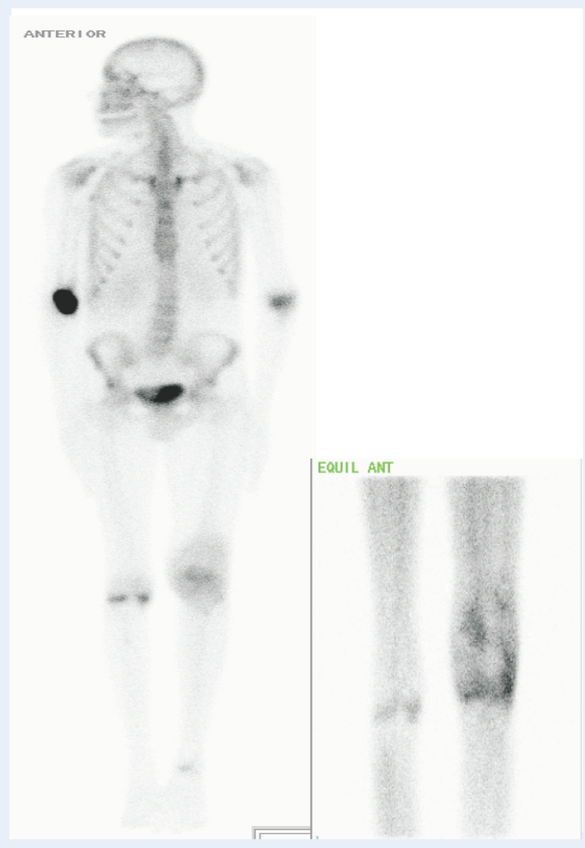


Figure 3: Bone scan of the same patient 6 months after treatment demonstrates a clear decrease in local flow, which was accompanied by a decrease in the number of joint bleeds.

CONCLUSION

The analysis of 65 joints treated with ^{90}Y-HA and ^{153}Sm-HA demonstrated that the RS is effective and safe procedure, and was able to signifficantly decrease the number of joint bleeds and clotting factor consumption.

DOI: 10.3252/pso.eu.WFH2012.2012