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THE USE OF 99MTC-LABELLED LEUKOCYTE SCAN AND OPEN BIOPSY IN THE MANAGEMENT OF ORTHOPEDIC PROSTHESES INFECTION

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BACKGROUND-AIM

The caring for patients with postoperative infection of orthopedic prosthesis produces a substantial burden on the healthy-care system and, more important, leads to a significant impact on the life quality of the patients. An effective outcome mostly depends on the characterization of the microorganism responsible for infection. Aspiration of the joint has been previously recommended as routine investigation, but at present, it seems to have a more limited role due to its false-negative and false-positive results. Open biopsy could be determinant to identify causal agents of infection, but sites for sampling should be determined. The present research is a prospective study aimed to evaluate the medical treatment efficacy of prosthesis infection by open biopsy performed on the basis of WBCS results in patients without loosening of orthopedic device.

METHODS

This study included 26 patients (mean age 70 years), 10 males and 16 females, with suspected hip (24) and knee (2) prosthesis infection. All patients underwent hemato-chemical preoperative tests and 99mTc-HMPAO-labelled leukocyte scan (WBCS). Patients with septic loosening underwent empirical antibiotic therapy in order to avoid two-stages re-implantation. In case of inadequate medical treatment patients underwent two-stages surgery. When the medical treatment was effective patients were submitted to one-stage operation. Periprosthetic tissue samples were taken at surgery, in order to ascertain or exclude the presence of infection. Patients without loosening of prosthesis but positive WBCS results underwent open biopsy: bone samples and periprosthetic tissues were taken from the regions showing pathological leukocyte uptake at the scan. Samples were submitted to microbiological examination and antibiotic treatments were undertaken in cases of bacterial growth. A 24-months clinical and instrumental follow-up was carried out in all patients.

RESULTS

Twenty-two patients had positive scintigraphic results at their first scan. Height of these resulted affected by septic loosening. Therefore, they received antibiotic therapy in order to avoid a two-stage re-implantation. Open biopsy was not performed because hip arthroplasty revision was mandatory. The medical treatment was inadequate in 6 patients and effective in 2. WBCS was negative in 2 patients without infection. Superficial infection was assessed by WBCS in 2 patients. Fourteen patients underwent open biopsy. From the 75 samples obtained, 49 showed bacterial growth and 26 gave negative results. After adequate antibiotic treatment, these patients underwent a clinical follow-up and were submitted to further WBCS in order to monitor response to therapy. In 9 out 14 cases a complete remission of the disease was found.

CONCLUSION

The obtained results indicate that a multidisciplinary approach to infection of orthopedic prostheses, characterized by the combined use of open biopsy, WBC and microbiological examination can produce positive results.