Reconstruction of skull defects following decompressive craniectomy is associated with a high rate of complications. Implantation of autologous cryopreserved bone has been associated with infection rates of up to 33%, resulting in considerable patient morbidity.

Predisposing factors for infection and other complications are poorly understood.

To compare the bone graft cryopreservation method (at -80 degrees C) with a preservation method using a 98% glycerol solution at room temperature (10 degrees C-35 degrees C), by testing the antibacterial and fungal effects of 98% glycerol and comparatively analyzing the observed histological changes resulting from the use of both methods.

This study was of 30 samples of trabecular bone tissue from 10 patients undergoing total hip arthroplasty. Each femoral head provided 3 samples that were randomized into 3 groups, namely, the control group, the cryopreserved group, and the group preserved in a 98% glycerol at room temperature for 1 year. The samples were submitted to histomorphologic, cell feasibility, and microbiologic analyses. The results were statistically analyzed using the McNemar test, with a statistical significance index of 0.05.

Values obtained using the McNemar test to compare probability distributions of histomorphologic variables (mature or lamellar bone, immature bone, and necrosis) and cell feasibility (osteoblasts and osteoclasts) indicated that there is no difference between the distributions of variables under the 3 experimental conditions. Microbiological analysis of the 98% glycerol solution and bone fragments from samples stored for 1 year at room temperature did not show bacterial or fungal growth. The histological and microbiological investigation were performed at 2 different time points: immediately after the sample processing and after 1 year.

The method used to preserve bone grafts kept in 98% glycerol at room temperature (10 degrees C-35 degrees C) was similar to cryopreservation in terms of bone matrix preservation; no bacteria or fungi were found in the samples [1)].

1)
Giovani AM, Croci AT, Oliveira CR, Filippi RZ, Santos LA, Maragni GG, Albhy TM. Comparative study of cryopreserved bone tissue and tissue preserved in a 98% glycerol solution. Clinics (Sao Paulo). 2006 Dec;61(6):565-70. PubMed PMID: 17187094.