Abstract
Various materials have been proposed for cranial reconstruction. Bone autograft and alloplasts such as polymethylmethacrylate (PMMA) and hydroxyapatite (HA) cement are most commonly used at the present time. Patients submitted for cranioplasty were evaluated. The prognostic factors influencing the results and the outcome were analyzed. Three hundred twelve patients who had 449 procedures performed by a single surgeon to reconstruct a calvarial deformity between 1981 and 2001 were studied. Post-tumor resection deformity was the main reason for cranioplasty (32.4%). Bone graft was the material of choice (69.5%). The main surgical site was the frontal bone (53.2%). Complications were observed in 23.6% of cases and were responsible for the least satisfactory results ($P > 0.001$), with infection and material exposure being the most critical complications. The eventual outcome was considered good in 91.8% of cases. The use of HA cement was associated with the worst results ($P > 0.001$). Bone grafts showed a high grade of partial resorption and required further surgery for correction. Multiple surgical procedures were correlated with a high rate of complications and an unsatisfactory outcome. Bone graft and PMMA are still the best materials in calvarial reconstruction. Even though HA cement is an osteoconductive material, it seems to induce what appears to be an immunoguided delayed inflammatory reaction that leads to thinning of the skin and exposure of the material, making secondary repair difficult. Before deciding which reconstructive option to use, a careful evaluation of the patient in terms of diagnosis, number of previous surgeries, and surgical site should be undertaken. If this is adopted, good results and a satisfactory outcome can be achieved on long-term follow-up.

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