ABSTRACT

At the emergency department of Dr. Soetomo Hospital approximately 230 craniotomies were performed each year for head injured patients.

Due to emergency considerations many of the bone flaps at these patients have to be removed and not repositioned and consequently disposed of because of lack of means of preservation. Yearly about 40 of such patients with skull defects need some sort of cranioplasty for protectional and cosmetic reasons.

Up till now, we have used acrylic (methyl methacrylate) for this purpose; this method however is quite expensive beside other pitfalls (infection, rejection, unsatisfactory cosmetic results for certain locations).

It is assumed that the best way to cover these skull defects is by means of autotransplantation, preferably by using calvarial bone. This means that detached bone flaps should be preserved before being used as an autograft.

Preservation of bone flaps in the patient's subcutaneous layer of his abdomen or thigh has been attempted before, but this brings about undesirable effects; psychological , pain, infection and significant absorption.

Preserving bone by means of autoclave or gas sterilization has also been done, resulting however in high absorption rates.

The object of this study is to compare the viability of cranioplastic autograft by using two different preservation procedures. The pre test - post test design was used.

Twenty eight patients were included, 21 males and 7 females. There were two phases of evaluation; the first phase is preservation in the subgalea or freezer at -80^{0}C. The second phase is 1-12 weeks after autograft cranioplasty.

Assessments were made by measuring :

1. Volume, circumference and thickness of bone before and after preservation;
2. Osteogenic capacity using histophatology scoring system by counting the osteoblasts, osteocytes and Haversian canals and condition of bone marrow;
3. Viability by measuring the uptake of radioisotopes Tc ^{99m}-MDP in the first and twelve weeks after cranioplasty, using static Scintigraphy and SPECT.

Results of this study showed that :

1. Circumference of preserved autograft decreased significantly after freezing;
2. Osteogenic capacity grades decreased significantly after freezing;
3. Viability by measuring of uptake of radio isotopes 12 weeks after cranioplasty is significantly lower in freezing, compared to subgaleal preserved graft.

It can be concluded that subgaleal preserved bone graft after a period of 40 - 87 days has a higher viability compared to bone graft preserved by freezing.

Key words : autograft, subgaleal preservation, cranioplasty, viability