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Histologic study of the effect of hyperbaric oxygen therapy on autogenous free bone grafts.

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PURPOSE: This study was undertaken to evaluate the effect of hyperbaric oxygen therapy on autogenous free bone grafts transplanted from iliac crest to the mandibles of rabbits. **MATERIALS AND METHODS:** A piece of corticocancellous bone harvested from iliac crest was grafted to a same-size bone defect in the mandibles of 16 Japanese white rabbits. In 8 rabbits, 20 and 10 sessions of hyperbaric oxygen (HBO) treatment were carried out twice per day (2.4 ATA 60 min.) before and after operation, respectively. The other 8 rabbits served as controls. The graft and surrounding bone were sampled at 1, 2, 4, or 8 weeks after transplantation, and the effects of HBO were evaluated by light micrography and contact microradiography.

RESULTS: At 1 week after grafting, osteoid formation in the experimental group was much greater than in the control group. Union between the grafted and the host bone was observed in the experimental group at 2 weeks after grafting, but it was not observed in the control group until 4 weeks. Although it was difficult to differentiate grafted from host bone in the experimental group at 4 weeks, it was readily distinguishable in the control group.

CONCLUSIONS: These results indicate that HBO accelerates the union of autogenous free bone grafts.

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