RBC limbs maintained maximal muscle contractility longer than HBOC-201 limbs; however, this did not reach statistical significance (p=0.57). Flexor (28.3±22.0 vs. 27.5±10.6 mmHg; p=1) and extensor (31.5±22.9 vs. 28.8±14.5 mmHg; p=0.82) compartment pressures at the end of perfusion were borderline physiologic in both groups. Creatine kinase and myoglobin concentrations were 42% and 22% higher at endpoint in the HBOC-201 limbs, but statistical significance was not reached (p=0.49, p=0.07, respectively). Lactate concentrations at endpoint were significantly higher in HBOC-201 limbs (20.2±2.8 vs. 14.6±3.9 mmol/L; p=0.02). The preservation of peripheral tissue perfusion was confirmed by infrared thermography and ICG angiography in both groups.

Conclusions: The results of this study suggest a trend towards better EVNLP outcomes with an RBC-based perfusate; however, for shorter durations of EVNLP, it may still be feasible to use HBOC-201 as an alternative oxygen carrier without significantly compromising limb quality. The authors believe that modifiable factors, including metabolism, may be responsible for the differences seen in the outcomes of HBOC-201-perfused limbs. Optimization of these factors could allow for the achievement of extended EVNLP with HBOC-201, overcoming the significant logistical constraints inherent with the use of traditional blood products.

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Occlusal & Dental Outcomes Following Facial Allotransplantation

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Purpose: Most of the literature surrounding face transplantation focuses on immunology, function, and psychology. Dental and orthognathic outcomes remain persistently underreported. This study sought to review the worldwide face transplant experience, and for the first time, evaluate dental, orthognathic, and skeletal outcomes.

Methods: All composite allografts containing maxilla and/or mandible with alveolus were examined, and dental and orthognathic complications recorded. Clinical photographs, radiographs, and/or CT scans from the literature were analyzed using Angle’s Classification, cephalometrics, and facial profile angles. The most recent orthognathic outcomes of our three facial transplant patients are also presented.

Results: The worldwide experience consists of 45 face transplantations; 25 patients received allografts containing maxilla or mandible, and 16 (64%) involved double-jaw. All documented patients had at least one dental/occlusal complication: TMJ ankylosis (9/25, 36%), dental caries and extractions (32%), palatal fistula (28%), Angle class II malocclusion (24%), class III (12%), open bite (20%), maxillary rotation (8%), skeletal non-union (8%), hardware infection (4%); 28% of patients underwent revision surgeries involving Lefort I, III, or mandibular osteotomies. Imaging conducive to Angle, cephalometric, or facial profile angle analysis was available in 100% (7) of reported maxilla, and 63% (10) of double jaw transplants. The majority of maxilla-only transplants had insufficient teeth, while soft tissue profile was most commonly class II. Double jaws were equally Angle class I, II, or III, but mostly class I or class III with regard to facial angle profile. All of our patients have received maxilla and/or mandible, and all have required dental extractions. Angle classification, cephalometrics, and facial profile angles vary across our patients, while class III soft tissue facial profile appears to predominate.

Conclusion: Dental and orthognathic complications remain extremely common but underreported after facial allotransplantation involving either single or double jaw composites. In fact, every documented face transplant has at least one occlusal or skeletal defect. The risk of malocclusion increases with simultaneous transplantation of maxilla and mandible, and often necessitates revision surgery in this unique population. Craniofacial principles and advanced surgical planning should be utilized to achieve facial balance. Additionally, we must standardize the way in which face transplant patients are presented in the literature.