OBJECTIVE
During guided bone regeneration (GBR), resorbable collagen membranes are placed over the bone graft to protect the augmented area from soft-tissue ingrowth and thus support bone formation. Prior to placement, the membrane is pre-wetted with saline or blood and once hydrated, it expands, potentially influencing the graft stabilization over time. The objective of this study was to compare in vitro expansion of two collagen membranes, and to test one of these membranes in a challenging clinical case.

MATERIALS AND METHODS
IN VITRO EXPANSION ASSAY
Two dry non-chemically cross-linked collagen membranes with different properties, Bio-Gide [BG] (Geistlich Pharma) and creos xenoprotect [CXP] (Nobel Biocare), were immersed in either saline or blood at room temperature. Nine membranes in each group (total of 36) were tested. Their surface area in mm² was measured at 5, 15, 30, 60, 120, 180 and 240 min. Surface area expansion of each membrane within the two environments was compared at every time-point using the t-test.

CLINICAL CASE
A 57 year old female patient, who was a smoker and had a history of moderate periodontitis that had been treated with a stable result, had missing teeth in positions 22–24 (FDI system). Tooth 22 was extracted 3 months prior to surgery. The patient’s alveolar ridge thickness was measured at 3 mm (position 22) and 4 mm (position 24) with bone quality type 2 and the bone quantity Class IV.

RESULTS
IN VITRO EXPANSION ASSAY
– Both methods of hydration led to membrane expansion. The CXP membrane expanded significantly less than the BG membrane in both saline and blood (Figure 1).

CONCLUSIONS
The clinical results achieved with the CXP membrane demonstrated easy fixation, perfect containment of the graft material and excellent wound healing. The significantly lower surface expansion of CXP provides for more accurate trimming of the membrane to the defect dimensions in a dry stage. In addition, the lower surface expansion compared to BG may potentially reduce strain on the primary wound closure. However, the hypothesis of strain reduction requires further investigation.

REFERENCES

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