

## SUMMARY

Tooth extraction and the healing of extraction socket results in bone resorption that leads to the reduction of the dimensions of the alveolar process both in height and width. These changes are considered physiological and occur with greatest intensity three to six months after tooth extraction. Taking into account the above data, it is necessary to consider performing procedures that preserve the alveolar process after extraction so that these changes are as small as possible. It is important to achieve satisfactory results of prosthetic or implant-prosthetic treatment.

The aim of the study was to compare the effectiveness of two techniques of alveolar ridge preservation in the aesthetic area of the maxilla. Procedures with and without flap elevation were assessed. In both cases, a cross-linked collagen membrane and an alloplastic material based on  $\beta$  calcium triphosphate were used. Twenty nine patients were analyzed and randomized to group A (n=15)- without flap elevation and group B (n=14)- with flap elevation. The comparison was based on a clinical examination (performed before the procedure and 3, 4 and 6 months after) and the evaluation of CBCT scans done before and 6 months after tooth extraction. The clinical study included the following parameters: full mouth plaque score (FMPS), full mouth bleeding on probing (FMBOP), keratinized tissue (KT), papilla height and width (PH, PW), probing depth (PD), recession (GR) and clinical attachment level (CAL) of teeth neighboring to extracted one, soft tissue thickness in the view of the root of the extracted tooth (measured 3, 6 and 9 mm from the extracted tooth gingival margin). On the CBCT scans alveolar buccal height (BH), lingual height (LH), buccal bone plate thickness (BBP) and alveolar horizontal width (HW) were measured at 5 measurement points. The results were statistically analyzed.

The patients enrolled in the study had good oral hygiene expressed by low FMPS values. The bleeding on probing did not exceed 25% in any of the groups. The PD, GR and CAL of the teeth adjacent to the extracted one did not change during the course of the study in any of the groups. Interdental papillae height decreased in both groups. The width of the keratinized gingiva decreased in both groups and changed from 6,5mm to 5,4mm in the flapless group and from 4,79mm to 3,82mm in the group with flap preparation in the six month follow-up. The thickness of soft tissues as measured by individually prepared positioners increased at the height of 3 mm and 6 mm in both groups. In the group without flap preparation, the change in soft tissue thickness was not significant at the height of 9 mm. Measurements made on CBCT scans

showed a reduction in the height of the buccal and lingual alveolus plate in both groups. However, these changes were significant only in the group without flap preparation, where the buccal plate was reduced on average by 1.08 mm and the lingual plate by 1.29 mm. A decrease in the radiological buccal bone plate width was observed, the greater the further the measuring point was from the bottom of the alveolus. In group B, at the height of 3 mm, 5 mm and 7 mm, the reduction in the width of the buccal plate gained statistical significance, and at the height of 9 mm, its thickness was only 0.01 mm. In group A, a significant decrease in the thickness of buccal bone plate was observed from 5 to 9 mm from the bottom of the socket. The width of the alveolar process decreased significantly only in group A at the height of 5 mm and 7 mm from the bottom of the socket.

Based on the results, the following conclusions were drawn:

1. Tooth extraction results in the remodeling of the hard and soft tissue architecture of the alveolus.
2. Ridge preserving procedures does not completely prevent this remodeling.
3. After both examined ridge preservation procedures the following occurs:
  - reduction of the interdental papillae height
  - reduction of the width of the keratinized gingiva
  - increasing the thickness of the buccal soft tissues at the height of 3mm and 6mm from the gingival margin of the extracted tooth
  - reduction of the width of the alveolar buccal bone plate
  - reduction of the height of buccal and lingual alveolar bone plate (significant for the group without flap preparation)
  - reduction of the width of the alveolar process
4. On the basis of the conducted examination, no conclusion can be drawn about the superiority of any of the examined procedures.