

# Histological comparison in alveolar ridge preservation between various bone grafting materials

Vakou D<sup>1</sup>., Zampa E<sup>1</sup>., Tsirigoni C<sup>2</sup>., Christaki N<sup>2</sup>., Silvestros S<sup>3</sup>.

1. Dentist
2. Dental Student, National and Kapodistrian University of Athens
3. Assistant Professor, National and Kapodistrian University of Athens

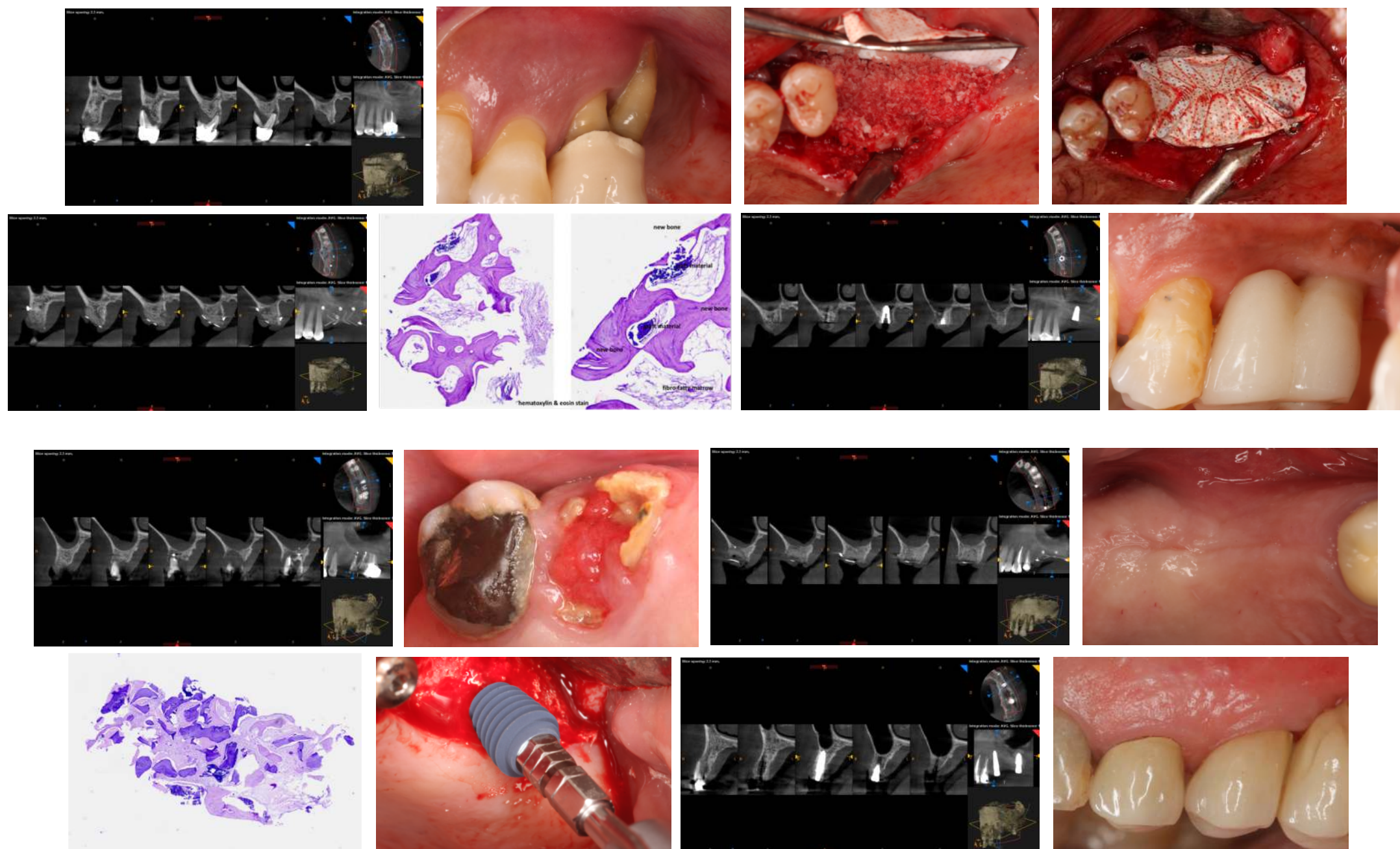


### Background/Aim

In several clinical cases, bone resorption after tooth extraction is so extensive that leads to difficulty for implant placement. For this reason, several techniques have been proposed in order ideally to preserve or even augment the alveolar ridge dimensions. Minimally traumatic tooth extraction combined with guided bone regeneration using various bone grafting materials is the most popular technique when the number of remaining bone walls or the remaining buccal bone plate is reduced. The aim of this poster is to present the histological differences in alveolar ridge preservation between xenograft alone and mixed allograft and xenograft material.

### Methods and Materials

Two female patients presented to our dental clinic. After clinical and radiographic evaluation the treatment plan included extraction and alveolar ridge preservation in tooth no 26 in both cases. The surgical technique and the biopsy were explained to the patients and both oral and written consents were obtained. Atraumatic extraction was performed. In the first case, 1cc xenograft was used to fill the post extraction socket in the bucco-lingual dimension. A dPTFE membrane was positioned. Primary closure was performed by using external vertical mattress sutures. In the second case the same procedure was performed by using mixed 0.5 cc xenograft and 0.5 cc allograft. After 6 months' healing, a trephine bur was used to obtain bone samples. Implant placement was performed at the same time. Samples were fixed in buffered formalin. After preparation by the laboratory, the samples were histologically studied under light microscopy.



### Results

In general, healing period was uneventful without any complications and the patient reported mild postoperative pain with no discomfort. Membrane exposure was seen in four weeks in both cases, delaying complete epithelialization of the wound. By the use of CBCT 6 months after the surgery, the final bone dimensions were measured and considered sufficient for the implant placement with primary stability. Through histomorphometric analysis both bone cores revealed a mixture of vital bone, graft material and marrow/fibrous tissue. Inflammatory cells were seen in both samples. In the second case osteocytes with osteoblastic activity were also existed.

### Conclusion and Clinical Implications

In conclusion, both bone grafting materials can successfully be used in ridge preservation. In addition although xenografts are only osteoconductive in both cases new bone formation occurs. In addition osteogenesis appears to be completed although biomaterial remains. Further long-term follow up studies including histomorphometric analysis are needed to understand the mechanism of osteogenesis at grafted future implant sites.