RESORPTION OF ALLOGENEIC BONE GRAFTS IN MAXILLARY RECONSTRATION AFTER A 12-YEAR FOLLOW-UP: A COMPUTED TOMOGRAPHIC, HISTOLOGICAL AND CLINICAL ANALYSIS

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Abstract

Allogeneic bone grafts from bone banks may be used in dentistry for maxillary and mandibular reconstruction. A lack of restriction regarding quantity and surgery at donor site, short and medium-term clinical success as well as the consolidation of the recipient site led to a rapid popularization of the technique. However, there are few reports in the literature with respect to longitudinal follow-up. The purpose of this study was to analyze the outcome of an implant-retained prosthesis after a 12-year follow-up by means of histological evaluation and computed tomography. As the results show, despite the clinical success of the prosthesis, long-term computed tomography follow-up confirms the resorption of the allografts, which suggests that this grafting technique may not be a consistent procedure or a safe alternative as compared to autologous bone grafts, at least as far as longitudinal preservation is concerned.

Aim

This case report aimed at analyzing the outcome of an implant-retained prosthesis after a 12-year follow-up by means of histological evaluation and computed tomography.

Methods and Materials

Year 2003; A 35-year-old caucasian female patient;Superior complete removable dentures;Insufficient bone width and height for implant installation;

Planning: maxillary reconstruction with bilateral maxillary sinus grafting as well as bone graft blocks in the canine and premolar region; 20-day period without prosthesis; rebasing with soft tissue conditioner;

After 9 months, 8 regular platform EH implants were installed in the grafted area;

The process of osseointegration required 6 months, after which the grafted area was reopened and a sample of bone/graft interface was obtained from 3.0 mm bone drilling for histologic evaluation of the bone grafting consolidation.

A ready-made protocol-type prosthesis was installed and adjusted on intermediate mini-pillars. The patient was provided with guidance on hygiene and maintenance.

Results

Despite a 12-year clinical success of the implant-retained prosthesis, a long-term computed tomography follow-up as well as a histological analysis confirmed the resorption of the allografts. Besides, we believe that, since the allogeneic bone grafts are extremely corticalised and mineralised, the in-depth penetration of osteoprogenitor cells was impaired, occurring only on the interface between the host bone and the allograft in new sites of bone formation. Away from this interface, however, we observed inactive bone tissue showing no osteoblastic activity due to its osteoconductive potential only.

Fig. 5 – Access to right and left maxillary sinus; allografts block fixation.

Fig. 6 – Consolidated grafting and sampling of interface for histological analysis.

Fig. 7 – Verification of parallelism and installation of implants.

Fig. 8 – First step for prosthesis installation and soft tissue after healing.

Conclusions

A tomographic follow-up of the grafted areas in conjunction with clinical evaluation is required in order to confirm the success of allogeneic bone grafts. It is presumed that since the allogeneic bone grafts are extremely corticalised and mineralised, the in-depth penetration of osteoprogenitor cells was impaired. Nevertheless, further studies and long-term tomographic follow-up of allografts are needed so as to verify the existence of a pattern regarding the progressive resorption of allografts throughout the years, as observed in this case study.

References

1-Gomes KU, Carlini JL,Biron C,Rapoport A, Dedivitis RA. Use of allogeneic bone graft in maxillary reconstruction for Installation of dental implants. Oral Maxillofac Surg 2008;(66):2335-2338.
2-Margonar R, Santos PL, Queiroz TP, Marcantonio E. Rehabilitation of atrophic maxila using the combination of autogenous and allogeneic bone grafts followed by protocoltype prosthesis. J Craniofac Sur 2010;21(6):1894-6.
3-Spin-Neto R, Del Barrio RAL, Pereira LAVD, Marcantonio RAC, Marcantonio E, Marcantonio Jr E. Clinical similarities and histological diversity comparing fresh frozen onlay bone blocks allografts and autografts in human maxillary reconstructioncid Clinical Implant Dentistry and Related Research, Volume *, Number *, 2011
4-Favato MN, et al. Impact of human maxillary sinus volume on grafts dimensional changes used in maxillary sinus augmentation: a multislice tomographic study. Clin Oral Implants Res. ,v.26, n.12,p.1450-5,dec 2015.
5-Chiapasco M.Clinical outcome of the use of fresh frozen allogeneic bone grafts for the reconstruction of severely resorbed alveolar ridges: preliminary results of a prospective study. Int J Oral Maxillofac Implants, v.30, n.2,p.450-460,Mar-Apr 2015.

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