Minimally invasive implant placement without the use of biomaterials using the bone expansion technique

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The success rate in implantology is close to 96 percent. Thanks to well-established implant placement protocols, with a few differences according to the implant system used, the predictability of the result under optimum tissue conditions is quite significant. It is very different when these conditions do not meet the recognised standards in terms of volume and quality for reproducibility in implantology. For example, thin ridges, which are frequent occurrences, will require a long and costly process for patients because they entail bone augmentation or possibly support tissue grafts.

Is there a minimally invasive alternative for these patients that allows them to be treated without these problems? One line of thinking is to stop the systematic practice of implantology as subtractive at the tissue level, but rather to transfer these changes, will require a long and costly process for patients because they entail bone augmentation or possibly support tissue grafts.

The general surgical principle of modern implantology, called osteotomy, as close as possible to the dimensions of the implant that will be placed. This principle is still widely prevalent. However, soft-tissue management has evolved, and the trend the past few years has been to manage soft tissue from the first surgical step. With the arrival of self-tapping conical implants, a new technique was developed that enables lateral as well as vertical bone coping, condensing or expanding. In addition, in 1994, Summers, practicing his crestal sinus lift technique with careful choice of conical taps, was the first to demonstrate the capacity of cancellous bone to be modelled (Fig. 1).

Through two clinical cases, we will see it is possible to be minimally invasive, precise and also avoid the use of biomaterials simply by exploiting the biomechanical properties of bone tissue and its capacity to regenerate. Respecting guided regeneration principles, which means the implant implantation of physical barriers to isolate the epithelial and connective tissue cells from the operating site, enables regeneration of the different tissues.

These principles are (Fig. 2):

- Completion of the best possible angio genesis to provide the required vascularity and undifferentiated mesenchymal tissue.
- Creation and maintenance of a space to facilitate bone formation inside this space.
- Stabilization of the surgical site to induce blood clot formation and facilitate healing.
- Thanks to the careful choice of the healing screw or the implant abutment/crown pair, these two entities with different regeneration potentials can be hermetically sealed, thereby avoiding cell competition, which we know contributes to the growth of epithelial cells which develop more rapidly.

Case 1

The patient presented with a fracture of #16 (Fig. 3) and periapical cysts. The patient was a middle-aged woman with a history of chronic rhinosinusitis. The fracture was a result of a fall from a height of approximately 1.5 meters. The patient presented with a fracture especially in the vestibule where the cortical bone is very thin. The lamina dura, which enables the attachment of collagen and Sharp ey’s fibres, presents a high potential for contamination. Consequently, a light manual curettage of the socket was carried out, followed by a superficial debridement (vaporisation) of the entire ‘lamina dura’ with an Erbium laser (5.240 mm) followed by decontamination with a diode laser (940 nm).

This was a flapless surgery. The expansion osteotomy was performed through the inter-radicular septum. It was initiated with a very thin manual bone tip (pointed) and then an automatic mechanical osteotome (Figs. 4-5) (Ethicon Safe®-Anthonys) was used. The use of convex inserts in the beginning enables lateral expansion of the native or healed bone and then concave inserts during the breaking of the last sub-sinus millimeter enables lateral bone recovery of this bone socket while protecting it apically.

During sinus progression PRF membranes (or native collagen membranes) are placed in the osteotomy opening to fill the intra-sinus space that is thereby gained (they also provide protection of the sinus membrane).

The Erbium laser is again passed through the osteotomy socket to vaporise the bone debris and sludge along the walls of this osteotomy. The implant is placed according to the manufacturer’s recommendations but with an even slightly higher torque if the titanium grade so allows. A healing screw that fits the diameter and height of the residual gap to be closed is carefully chosen (Fig. 6).

If the healing screw does not enable primary closure of soft tissue, PRF membranes are used to fill the gap. If this gap is too big a mucoperiosteal detachment of 6-10 nm and then a horizontal incision of the peristium of 6-8 nm are made. This technique serves to pull the gum around the healing screw by maintaining it with two sutures. The control X-rays clearly showed good osseointegration of the implant, significant filling and regeneration in only three months, and then perfect filling and regeneration four months after surgery.

The bone remodeling around and above the implant neck also seemed...
The advantage of this technique was noted starting in 1996 by Summers and associates of Dental Traumatology. Since 2000, the practice of tissue in his field has revolutionized his procedures. His prac- tice is limited to oral trauma and endodontics in Paris and Venice, Italy. He holds different.Member and post-graduate in laser, periodontology, implant their dentists. Current evidence suggests the least invasive tech- niques still require many improvements and more wide-spread valida- tion. However, for reasons of time and safety, the practitioner al- ways suggest the least invasive tech- niques that contribute to, guides and induces this tissue regeneration for which, most of the time, we have the matrix around these traumatized zones.

References
2. Electrical mill in implants placed in fresh extraction sockets with simultaneous osteotomy sinus floor lift as 'split crest' where the buccal cortical bone is generally very fragile.

Vital importance is attributed to the closure of soft tissue during implant placement, either by carefully choos- ing the healing screw (the height and diameter) or the implant abutment, enabling slight compression of soft tissue and providing a barrier against the implant/ prosthetic connection system with a 'barrier' that enables the regenera- tion of the two families of tissues. These minimally invasive tech- niques still require many improve- ments and more wide-spread valida- tion. However, for reasons of time and safety, the practitioner always suggest the least invasive tech- niques that contribute to, guides and induces this tissue regeneration for which, most of the time, we have the matrix around these traumatized zones.

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