

Balloon-Lift-Control (BLC): a minimal-invasive system for the elevation of the sinus floor mucosa

Part 1

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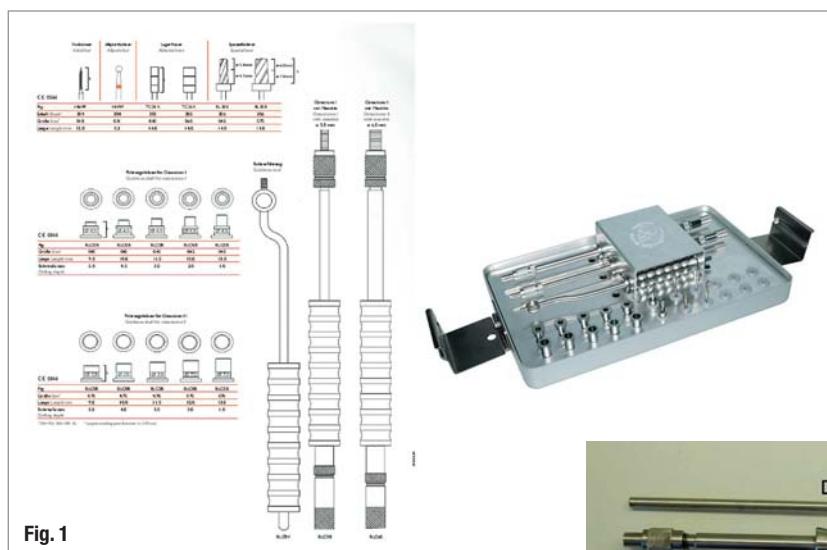


Fig. 1

Fig. 1_BLC System. Left (from above): Set of different drills and distance tubes. Middle (from left): Lunette (distance tube guide) and two osteotome instruments with apical diameters 3.8 and 6 mm. Right: Surgical tray containing the instruments (drafted on the left hand side).

Fig. 2_Components of an osteotome: Guidance instrument (a) with ergonomic handle (b) and adaptive apex (c). Above it the "mandrin" consisting of a bar (d); literally the osteotome) and an adjustable handle (given in more detail in Fig. 4). The mandrin fits into the tube of the guidance instrument.

Fig. 3_Apex of the osteotome: (b) Shaft with its (b) intraosseous tip (graduated in mm). (c) Security screw (to support the instrument by screwing it to gingiva level when the instrument is inserted into the osseous bore hole).

Within the last 30 years implantology has become more and more a standard treatment in daily dental practices. Endosteal implants have proved to be not only the basis of tightly fixed dentures, they obviously are capable, but also to prevent alveolar bone resorption. The materials, shapes and macro- as well as micro-designs of surface structures were the subject of a constant process of further development.

Also, surgical techniques were created and published to improve the quality and quantity of the bony recipient layer. These advancements are proven in that in former days implants had to follow the available target layer in size and shape while nowadays we obviously have the materials and techniques

on hand to correct local bone deficiencies and to install a sufficient implant construction.

A special problem of deterioration of the osseous implant layer takes place when the teeth in the side region of the upper jaw are getting lost. Then, atrophy of the alveolar ridge takes place in centrifugal as well as centripetal direction. The result, after a relatively short time, is a maximum loss of vertical height of the alveolar process. The upper jaw side region, however, is of superior importance for dental implantology since it is subject of particularly high axial and lateral stresses.

Basically, the resorbed bone in this area can be fortified with two techniques:

First, a buckle—preferably taken from the hip bone—is attached to the alveolar ridge as a so-called onlay-augmentation.

Second, the bony sinus floor is strengthened by the insertion of bone construction materials (bone defect fillers, BDF) into a room, which is prepared by elevating the interior lining of the maxillary sinus floor.

Clinically, the latter procedure is used first and foremost.

To begin with, the maxillary sinus lining mucosa—the so-called Schneiderian membrane—must be elevated without a macro- or micro-trauma. Granular augmentation material could penetrate the membrane rupture, and thus arrive at the non-resorptive epithelial layer of the membrane. In the past, two different techniques have been described for access to the maxillary sinus and the elevation of the sinus floor membrane:

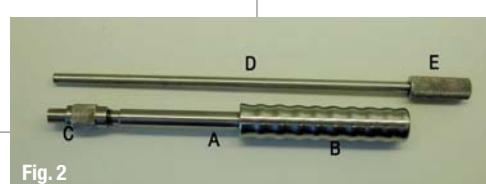


Fig. 2



Fig. 3