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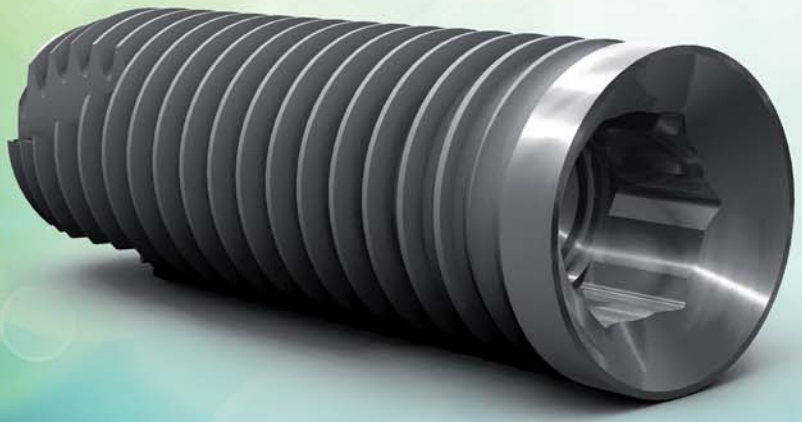

case report
44 Roots—44 Implants

clinical technique
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interview
"Paradigms are beginning to shift"

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*NobelActive was voted best implant 2011 at the Saúde Oral Awards in Portugal.

Dr med dent Roland Hille

Digital implantology —a sign of the times

_It is a sign of the times that the dental industry and dental laboratories are trying to add to the value of implantology through the use of innovative technology and service concepts. Individual dentists practicing implantology are facing a number of current challenges, especially economic ones. Whether in the case of intraoral scanners, 3-D diagnosis and 3-D planning or CAD/CAM manufactured prostheses, the time for stand-alone applications is over. The largest implant manufacturers believe that the future lies in all-in-one solutions which focus in particular on patients' needs—i.e. which are gentle, safe, functional, aesthetic, long-lasting and of high quality.

Implantology associations such as DGZI are under an obligation to inform dentists, dental technicians and dental staff about these new methods, systems and approaches, but also to critique them at the same time. A specialized podium discussion on the topic of "Digital implantology—What will and what must be done?" will look at the topic of digitalization in the fields of general dentistry and implantology, and will play an important role at DGZI's 41th International Annual Congress in Cologne. Experts from home and abroad as well as university professors and dental practitioners will carry out an in-depth discussion and present contemporary concepts.

The board of the German Association of Dental Implantology (DGZI e.V.) looks forward to meeting you on September 30 and October 1, 2011, in Cologne.

Dr med dent Roland Hille
Vice President of DGZI

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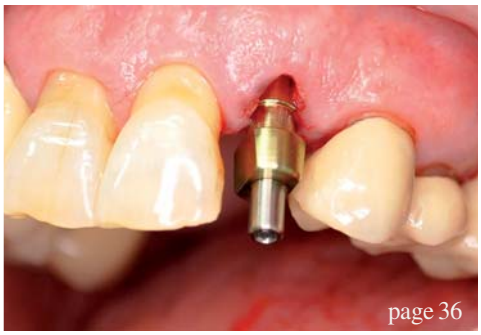
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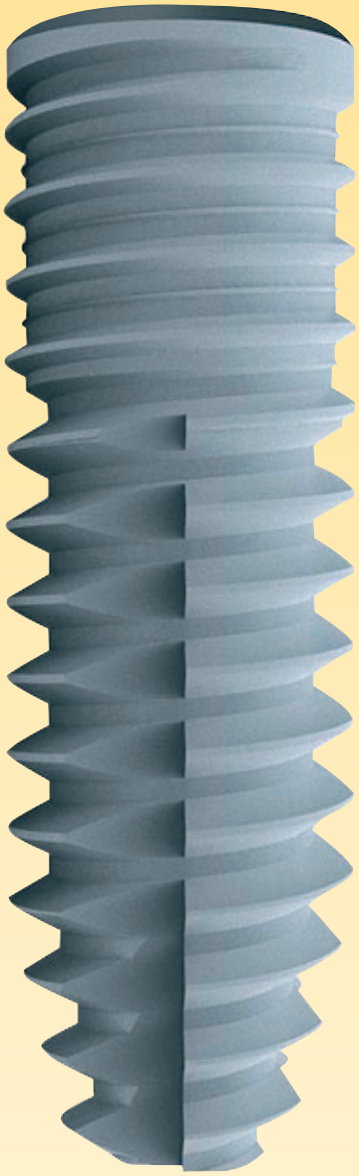

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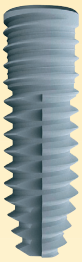

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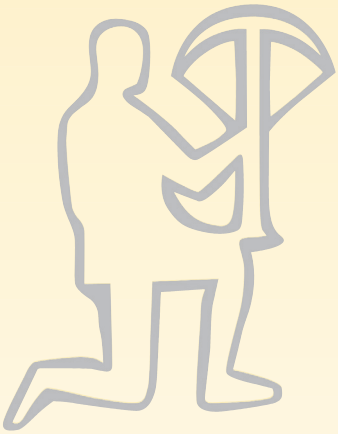

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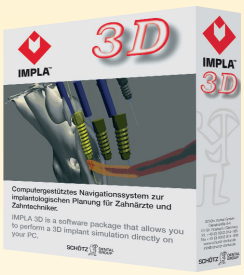

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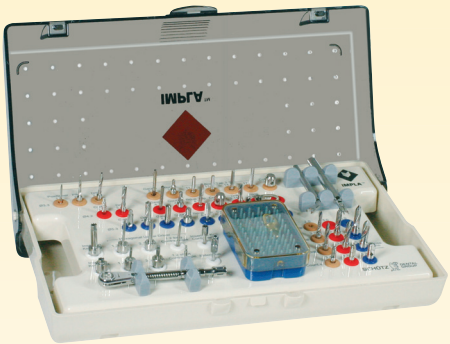

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44 Roots—44 Implants

A case report

Author_Drs Eduardo Topete A., Estela Topete Z., Eduardo Topete Z. & Alberto Topete Z., Mexico

Fig. 1_Jose Conte (1997).

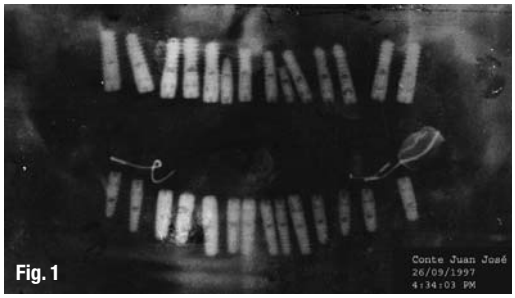

Fig. 1

_Various surgical techniques for bone augmentation of the maxilla and mandible are mentioned in the literature. This article offers viable alternatives to maxillary and mandibular surgery, helping to prevent implant resorption in molar areas.

_Back to the roots: "Implantology 2000"

The implantology profession agrees that a greater number of implants to support the prosthesis is a determining factor of success. A greater number of implants decreases the number of pontics, improves the biomechanics by reducing strain on the prosthesis and dissipates stresses more effectively to the bone structure, especially at the crestal level. The maximum osseous surface area and adequate bone density are requirements for long-term resistance to occlusal loads.[7] In addition, the greatest functional surface area is required in the crestal 5 mm of the implant body. Comparisons between natural tooth roots and implants show that increasing the surface area by increasing the number of implants is a prime requirement for achieving long-term success of dental implants.[10]

Fig. 2_Jose Conte (2007).
Fig. 3_ I.P.S.P.S. diagram for implants of 3.26, 3.76 and 4.10 mm in diameter.

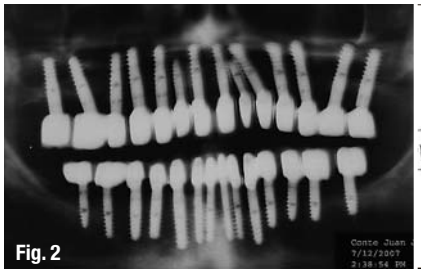

Fig. 2

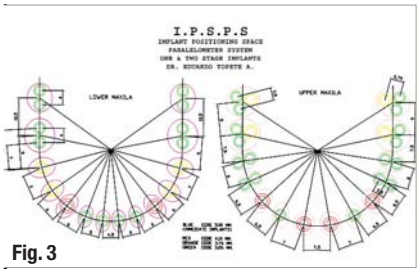

Fig. 3

In the past, the replacement of one molar with a single implant was widely accepted as the recommended standard practice.[8] As an innovative and viable alternative to the current standard practice, replacing mandibular molars with two implants and maxillary molars with three implants has been successfully applied since 1994, in other words one implant per root lost. This technique of using multiple implants preserves the natural crown–root ratio of molars. More importantly, multiple implants reduce and balance the occlusal forces. This reduction in occlusal forces greatly reduces implant–bone stress on the surface contact areas in the posterior regions of the mouth where the maximum stress is placed on the molars.

In the 1980s, force reduction and surface area were difficult to balance in the posterior regions of the mouth. Studies clearly demonstrate that the forces are often 300 % greater in the posterior areas compared with the anterior regions of the mouth. Bone densities and strengths are 50 to 200 % weaker in the posterior regions of the mouth. Yet, implants with a greater surface area (according to length) were inserted in the anterior regions. Natural teeth do not have longer roots in the posterior regions of the mouth, where stresses are greater. Instead, increased surface area is achieved with a greater number of implants, placing two implants in each lost molar. In available bone of adequate width, replacing the lost roots with the same number of implants is recommended, placed in the same position and direction that nature created (within anatomic limitations),[6] especially in cases in which only a few millimetres of bone remain between the cortical floor of the sinus and the crest of the ridge.[10]

This way, the distribution of the bite forces in key points proposed by Misch in his paper at the World Congress of Oral Implantology in Taipei in 2006 could be achieved using thin implants inserted in strategic positions, passing along the sides of the walls of the sinus to create a tripod to support the maxillary molars and along the sides of the dental nerve to form the bipod that mandibular molars need to support the oc-

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Fig. 4_ I.P.S.P.S. diagram for implants of 3.10, 2.75 and 2.50 mm in diameter.
Fig. 5_Case of 27 crowns on 27 individual implants (1991).
Fig. 6_Case of 40 implants in a 58-year-old male patient (2001).

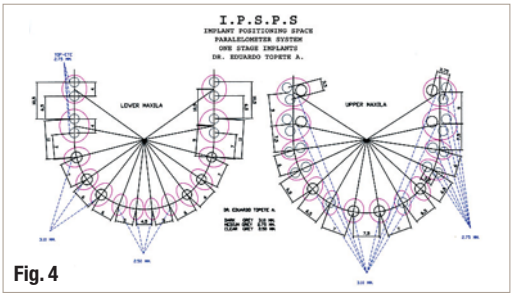

Fig. 4

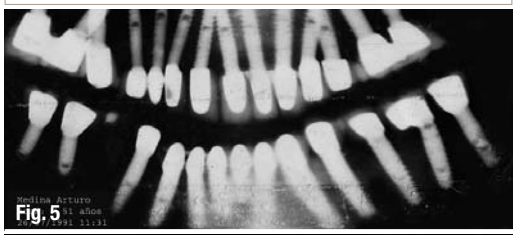
Fig. 5

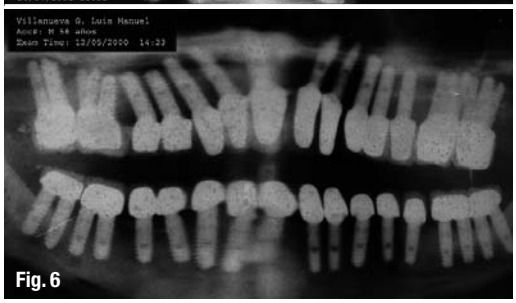
Fig. 6

clusal forces. This could be achieved without transplanting osseous blocks from different parts of the body, which makes it a less invasive implantology. The disadvantages of sinus elevation, taking osseous blocks from different parts of the body and nerve repositioning are well known.

Disadvantages of sinus elevation
1. Extended trauma of soft and hard tissues
2. Operation lasts considerably longer
3. Surgery exposes the wound to a higher risk of bacterial and viral contamination
4. Expanded post-operative swelling and high levels of pain are inevitable with the risk of post-operative complaints
5. Sometimes only 3 to 4 mm can be gained in order to avoid creating large pointed loads on the sinus membrane
6. The following may occur during or after the operation:
   a) Soft-tissue complications
   b) Rupture of the Schneiderian membrane
   c) Contamination
   d) Fistula
   e) Cavity
   f) Infection
   g) Soreness
   h) Lost of bone and resorption of the graft material (resorption of more than 2 mm in two years)
   i) Peri-implantitis
   j) Bleeding
   k) Exuding of pus
   l) Future loss of implants.

Disadvantages of taking osseous blocks from different parts of the body
1. Insensibility of the dental lower nerve when blocks of mandible have been cut
2. Mandibular fractures
3. Numbness of the anterior or posterior mandibular teeth when blocks are taken from the chin or the area of the mandibular branch
4. Exposure of the blocks and fixation screws owing to insufficient soft tissue to close the incision completely
5. Soft- and hard-tissue complications
6. Inflammation
7. Bleeding
8. Exuding of pus
9. Infections that may cause loss of the blocks.

Disadvantages of nerve repositioning
1. Extended trauma
2. Operation lasts considerably longer
3. Surgery exposes the wound to a higher risk of bacterial and viral contamination
4. Expanded post-operative swelling and high levels of pain are inevitable with the risk of post-operative complaints
5. Insensitivity of the lower dental nerve
6. Soft- and hard-tissue complications
7. Inflammation
8. Bleeding
9. Infections.

However, using CT, virtual models and guides could be created to insert implants in the places in which there is good bone quality and no nerves, arteries, sinuses or nose fossae are affected. This operation of inserting implants without soft-tissue reflection is minimally invasive and is usually of shorter duration. In addition, the danger of contamination and post-operative complaints are less likely, the healing and osseointegration times are shorter, inflammation and pain are minimal and, frequently, the patient reports no pain at all.

The distribution of chew forces using individual implants and one implant per root lost eliminates a united rehabilitation,[4] and also avoid the cantilever[5] that causes the resorption of the mesial and distal walls of the implants, owing to the leverage forces applied by the cantilever. Misch mentioned that with a greater number of implants, resorption, bone loss and the consequent loss of the implants can be avoided. In addition, Perel mentioned that poor planning of a case will lead to failure. In his conference paper, "Plan it or lose it", he recounted that any case must entail planning for adequate function in the future and must

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