Ten facts about dental implants

By Sebastian Saba DDS, Cert. Pros., FADI, FICD, Editor in Chief

Dental implant marketing often emphasizes “simplicity,” underplaying an inherent complexity in the product, procedure — and patient. Prosthetic dentistry is not simple. And patients rarely have simple problems. Potential complications can be far from simple to correct. To ease your learning curve with implant dentistry, following are some core variables that can be managed based on proven research.

1. Implant surface design: Choose implants that have micro-topography and bioactive surfaces that enhance bone contact and have macro-topography (overall shape) that better stabilizes bone profiles with little or no crestal bone loss.

2. Abutment connections: Internal connections have simplified abutment insertion. And if the abutment-implant margin is kept shy of the implant outer surface, a connective tissue zone will develop. The result is improved bone preservation at the crest. Abutments should be torqued to position and have specifically designed abutment screws that support long-term stability.

3. Provisionalization phase: Once thought optional, today this step is a critical diagnostic and management tool used to verify osseointegration, occlusion, esthetics, soft-tissue management, hygiene, prosthetic design and abutment selection.

4. Prosthetic options — screw versus cement: Some companies emphasize a “simpler” and familiar cement-only option. But irretrievability — presence of subgingival cement — can be problematic. Plan your design to minimize complications.

5. Earlier osseointegration and restorative phases: Improved implant surfaces and shapes support primary stability in bone and enhanced osseointegration. Early loading is becoming more feasible — choose cases carefully.

6. Soft- and hard-tissue management: Timely placement of provisionalals can influence the support and contour of tissue. Advance ment in bone grafting and tissue preservation help preserve soft tissue, maintain anatomical bone contour and improve gingival esthetics.

7. Enhanced marketing: Implant dentistry is aggressively promoted. However, costs remain high for average-income patients. It’s critical that benefits a patient realizes far outlast any corresponding debt.

8. Technological improvements: Zirconia ceramics and CAD/CAM have created an explosion in design, customization and improved esthetics. Zirconium is doing for esthetics what titanium did for osseointegration.

9. Computer-guided implant therapy: You can’t deny the value of 3D software that helps measure and locate vital structures such as the mandibular nerve, sinus cavities and nasal floor. But most practices still rely primarily on conventional radiography.

10. Long-term studies: Implant companies provide education, solid research and ongoing support to customers (you). Incorporating up-to-date knowledge into the clinical variables you’re managing on a daily basis will enable you to achieve a predictable approach in your decision-making with dental implants.

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Bone quality related to implant location

By Souheil Hussaini, Dubai

The causes of early implant failures during the osseointegration process include poor quality and quantity of bone and soft tissue, the patient’s medical condition, unfavorable implant design and surface characteristics, implant position or location and unknown factors.

This article attempts to further investigate implant location as one of many factors in early stages of diagnosis that improves success rate in implant dentistry treatment. Predisposing factors to implant complications in different jaw regions are discussed.

CBCT Zones

D1 to D5 is formulated to better analyse implant dentistry procedure preparation during the diagnostic phase based on the location that has a logical sequence during examination of the alveolar ridge of both maxilla and mandible to have pre-existing information regarding the demands and the clinical requirements in different zones of the jaws. This article identifies the alveolar ridge anatomy of the edentulous alveolar ridge.3, 4

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Average HFU of different areas in the mouth

D1 to D5 are related to the bone quality classification of Lehmann & Zarb.3, 4 D1 known as an interfossa area in which a careful diagnosis should be made. This area needs to be evaluated prior to any implant procedure; bone density is very high and the osteotomy drills could heat the bone, irritation, which could facilitate healing response, dullness of the drills during osteotomy should be counted for, tap drills are required, artificial supply in the symphysis area should be considered and this area is utilised as a donor site for the chin (symphyseal) bone graft block. D1 includes six anterior teeth with buccal and labial incisions and two canines. A thin alveolar process in this area necessitates implant placement design and surface characteristics.5, 6 implant position or location and unknown factors.7

This article attempts to further investigate implant location as one of many factors in early stages of diagnosis that improves success rate in implant dentistry treatment. Predisposing factors to implant complications in different jaw regions are discussed.

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The highest bone density in the maxilla was observed in the canine and premolar areas, and maxillary sinus showed the lowest bone density. Density of the cortical bone was greater in the mandible than in the maxilla and showed a progressive increase from the incisor to the retromolar area.

D5, known as the sinus zone, is a bilateral zone of the alveolar ridge of posterior maxilla located at the base of the maxillary sinus from the second premolar to the pterygoid plates. There are certain common features of implant placement in the posterior teeth compared to anterior teeth (generally one or two molars) with dental implants in this zone. It often relates to the degree of sinus pneumatization and vertical bone deficiency that may require supplemental surgical procedures in the subantral area in order to place endosseous implants.

This bilateral maxillary posterior zone that extends from the second premolar to the pterygoid plates is located at the base of the maxillary sinuses (antrum of Highmore). Embryologically, the hard palate and the alveolar process of the maxilla form the barrier between the maxillary sinus and the oral cavity. The bone height between the floor of the maxillary sinus and the alveolar process is routinely analyzed in oral implantology when posterior maxillary implants are contemplated. An increase in sinus volume or sinus pneumatization after a loss of posterior tooth/teeth often necessitates vertical bone augmentation with a sinus lift procedure. The bone of this region is also known to have compromised bone quality (types 3 and 4) that can increase implant failure rate. The main blood supply to the posterior maxilla derives from the posterior superior alveolar artery, the greater and lesser palatine arteries (all from the maxillary artery), the ascending palatine branch of the external carotid artery, and the ascending palatine branch of the facial artery. An injury to the posterior superior alveolar artery during the lateral approach for subantral augmentation can cause haemorrhage that may require coagulation.

Materials and method

From a data base of 1,354 patients who had received 4,700 dental implants from 2001 till August 27th 2015, randomly a prosthodontist with no knowledge of the criteria was requested to select 100 files from the data base and present them for this study. The 100 files had received panoramic and cone beam computed tomography (CBCT; Table 1) during their diagnostic visit. The average HFU of the randomly selected 100 cases was calculated.

Results

Hounsfield unit. The data in table 1, out of 100 samples, demonstrated that the average HFU was the minimum in D5 (213 HFU), and followed by D4 (228 HFU), D3 (261 HFU), D2 (199 HFU), and D1 (314 HFU) in ascending order respectively (Fig. 1 and Table 1).

Discussion

There are few literature reports that attempt to study implant location, among a multitude of other factors, to determine its influence on the success or failure of dental implant treatment. Becker et al. evaluated 282 implants placed in the maxillary and mandibular molar positions in a prospective study.34 The six-year cumulative success rate (CSR) for maxillary posterior implants was 82.9 per cent, for mandibular posterior, 91.5 per cent. He concluded that the CSR in the posterior regions is lower than usually reported for anterior regions of the maxilla and mandible and may relate to differences in bone quality and quantity. Eckert et al. assessed 1,170 endosseous implants placed in partially edentulous jaws in a retrospective study.35 In his report, the location of implants did not appear to have any effect on implant survival, implant fracture rate, screw loosening, or screw fracture. Parent et al. analyzed 332 consecutively placed Branemark implants that were inserted in 152 partially edentulous posterior mandibles and restored with 51 crowns and 69 bridge restorations in a long-term retrospective study.36 The CSR of all implants in the posterior mandible was 89.0 per cent at six years.

Fewer complications were found in implant prostheses located exclusively in the premolar region versus molar and mixed molar-premolar implant restorations. Drago investigated the location-related osseointegration of 675 implants placed in 189 patients that were observed from seven months to eight years follow-up on occlusal loading.37 Implant osseointegration was 89.5 per cent in the anterior maxilla, 73.4 per cent in the posterior maxilla, 96.7 per cent in the anterior mandible, and 98.7 per cent in the posterior mandible. Moy et al. analyzed implant failure rates and associated risk factors, observed implant failure of 8.16 per cent in the maxilla and 4.95 per cent in the mandible.38 Increased age (over 60) was strongly associated with the risk of implant failure. Bass et al. evaluated 303 patients with 1,097 implants over a three-year period, assessed the success rate of implants in the maxilla at 93.4 per cent and 97.2 per cent in the mandible.39 Poor bone quality played the major role in implant failure due to bone quantity demonstrating less importance.

Conclusion

There is a trend of escalating levels of HFU in different parts of the oral cavity. The highest being the anterior mandible, followed by the posterior maxilla, posterior mandible, anterior maxilla and posterior maxilla with sinus lift procedure respectively. Estimated HFU can assist the surgical phase, as the number of the ancillary procedures can be pre-estimated according to different areas in the mouth during the diagnostic phase.
Fundamental misconceptions about Dental implants among patients

By Implant Magazine

Investigating patients’ knowledge and perceptions regarding implant therapy, a Chinese study has found that an alarming number of participants had inaccurate and unrealistic expectations about dental implants. Moreover, the study determined that only 81 per cent felt confident about the information they had about treatment. In the study, the researchers investigated preoperative information levels, perceptions and expectations regarding implant therapy via a questionnaire. Responses from 277 patients were obtained during 2014 and 2015 in three different locations in China (Sichuan and Jiangsu). The analyses established that about one third of the participants had mistaken assumptions about dental implants. The study, titled “What do patients expect from treatment with dental implants? Perceptions, expectations and misconceptions: A multicenter study”, was published online ahead of print on 23 March in the Clinical Oral Implants Research journal.

Increase in caries rates after Fluoridation cessation

By Implant Magazine

Community water fluoridation is a matter of debate around the globe. While it is used widely in North America, many European countries have stopped the practice. Owing to a lack of contemporary research on fluoridation cessation, however, researchers in Canada have now investigated its impact on dental caries experience.

In Canada, community water fluoridation has been in place since 1945. In a recently published study, researchers at the University of Calgary therefore compared changes in caries experience in schoolchildren in Calgary with those in Edmonton, which has experienced in schoolchildren in Calgary with those in Edmonton, which has

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In the Community Dentistry and Oral Epidemiology Journal ahead of print.