Application of different materials and designs in all-on-four restoration: Analysis of prosthetic questionnaire

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Abstract

Objective: To assess the subject feeling of patients receiving all-on-four procedure in upper and lower jaw with various kind of alveolar bone defect and absorption by questionnaire survey. Particularly the subject feeling of prosthetic procedure. **Methods:** Installed implants by the all-on-four technique in patients with various kind of alveolar bone defect and absorption. Immediately design the Maló bridge in EXO-CAD software. Manufacture the provisional restoration after post-operative swelling period and definitive restoration in half a year. Dividing function and beauty of denture to six statements: masticatory function, phonetic function, self-cleaning, white esthetics, pink esthetics and facial fullness. According to the satisfaction of patients, a scale of 1 to 7 is created for each of the statements. Patients give each statements a score within this range in 6 months and 12 months. Analyze the questionnaire. **Results:** Statistical analysis based on questionnaire are made from 16 maxillary dentulous and 23 mandible dentulous cases. **Conclusion:** The satisfaction of masticatory function using definitive restoration is much better. For phonetic function and esthetics, it is easy to achieve a better score after raft installation.

Background and Aim

In most majority dentulous case, various kind of alveolar bone defect and absorption can be discovered. The all-on-four technique can restore mastication satisfactorily and rapidly in cases of moderate and severe alveolar bone defect and absorption. Normally, the Screw-retained implant-supported superstructures of all-on-four is Maló bridge, which is consist of metal or zirconium rack and veneer made of thermal resin or polymerization porcelain. In addition to prosthetic material, suitable prosthetic design can promote the rehabilitation efficiency of function and beauty according to bone defect and absorption with varying degrees. Different choice of prosthetic materials and designs make a big difference in rehabilitation of function and beauty.

Aim of this study was to assess the subject feeling of patients receiving all-on-four procedure in upper and lower jaw with various kind of alveolar bone defect and absorption by questionnaire survey. Particularly the subject feeling of prosthetic procedure.

Methods and Materials

Installed implants by the all-on-four technique in patients with various kind of alveolar bone defect and absorption. Immediately copy the occlusion relationship after surgery. Transfer it to digital models by Freedom HD 3D scanner, then design the Maló bridge in EXO-CAD software. Manufacture the provisional restoration (rack : acrylic plastic, veneer: thermal resin) after post-operative swelling period and definitive restoration (rack: alloy metal , veneer: polymerization porcelain) in half a year. Dividing function and beauty of denture to six statements: masticatory function, phonetic function, self-cleaning, white esthetics, pink esthetics and facial fullness. According to the satisfaction of patients, a scale of 1 to 7 is created for each of the statements. Patients give each statements a score within this range in 6 months and 12 months. Analyze the questionnaire.

Results

Statistical analysis based on questionnaire are made from 16 maxillary dentulous and 23 mandible dentulous cases. The average and variance score of masticatory function, phonetic function, self-cleaning, white esthetics, pink esthetics and facial fullness are recorded in table 1.

Factor		Average	Variance
masticatory function	P	6.17	0.44
	D	6.45	0.45
phonetic function	P	5.75	1.04
	D	5.81	1.41
self-cleaning	P	5.48	0.79
	D	5.86	0.59
white esthetics	P	5.56	1.11
	D	6.14	0.89
pink esthetics	P	6.23	0.76
	D	6.18	1.06
facial fullness	P	6.09	0.95
	D	6.25	0.90

Ps. P for provisional restoration, D for definitive restoration

Table 1 average and variance score of different factors

Conclusions

The satisfaction of masticatory function using definitive restoration is much better, because the rack material has been replaced to alloy metal, which is often with even high strength. Meanwhile, it is also considered relating to medical advice as no overloading in early implantation. There are some old patients complain about the weight of definitive restoration. The clinical outcomes showed that the effect is improved obviously by exchange the material of rack back to acrylic plastic with a premise on sufficient occlusal force. For phonetic function, patients with severe alveolar bone defect and absorption scored lower because of bigger volume of the restoration. The self-cleaning is related to alveolar bone defect and absorption as well on the same issue of volume and weight. The score of white esthetics is influenced by the direction of prosthetic screw-socket. It is easy to achieve a better score of crown prosthesis after raft installation. The rehabilitation of pink esthetics is satisfactory, and apply saddle-type rack designs can cover the exposed multiple abutments effectively. In turn, it reduces score of phonetic function or self-cleaning. The facial fullness has nothing to do with material or design of the restoration, in addition, the worse alveolar bone condition the better subject felling.

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