

## THE DEFINITION OF THE INDICATIONS FOR IMMEDIATE LOADING OF DENTAL IMPLANTS

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**Annotation.** *This article deals with the results of immediate loading of 145 screw implants on the base of objective apparatus and instrumental methods of determination of their stability. From 145 implants 75 implants of Any Ridge construction and 70 implants of Any One construction were successfully integrated into maxillary bones.*

**Keywords:** *MEGA ISQ (Implant Stability Quotient),* tork-testing, frequency-resonance testing, immediate loading, osteointegration, immediate load.

**Relevance.** At the present time to resolve the complete and partial loss of teeth in the dental practice are widely used dental implants. It is well known that from the day of the installation of intraosseous screw implants to the final prosthetics, it will take some time for the full course of the osteointegration process. For the onset of full-fledged osteointegration, according to the standard clinical Protocol, it takes from 3 to 4 months, depending on which jaw the implant is placed on. If there is significant bone atrophy in the jaws, additional surgical measures are performed to increase the volume of bone tissue. In such cases, the osteointegration period can last up to a year, which is a long process.

In this regard, reducing the time of orthopedic treatment of various defects of the dentition using dental implants is of great interest among dentists. It should be noted that according to the analysis of the literature in the world practice of dentistry, a sufficient number of research works are being carried out in this direction. They are mainly aimed at the possibility of immediate loading of implants after their installation without waiting for the osteointegration period. The development of new implant surfaces and new clinical technologies has significantly reduced the duration of the initial healing period up to the immediate, early loading of implants with high stability. However, analysis of the literature data shows that clear objective indications for immediate implant loading have not yet been determined.

Based on the above, we have set a goal to determine the indications for immediate loading of implants according to new objective hardware research methods that are available right at the dental chair.

To achieve this goal, the following tasks are defined:

1. To study the indicators of torc testing of implant stability using a dynamometer key.
2. To study the stability of implants using the frequency-resonance method using the MEGA ISQ device.
3. Based on the results of testing the stability of the implants, determine the indications for immediate loading of the implants.

#### **Material and research methods:**

In the world practice of dental implantology, several methods for assessing the stability of implants are known:

- \* clinical (percussion, manual control of implant stability);
- pericentromere;
- \* TORK test (using a torque wrench);
- \* x-ray methods of research (including the method of densitometric assessment of bone density);
- \* frequency-resonance analysis.

According to a number of authors the frequency-resonance method for determining the stability of implants is the most modern and objective. In our work, the torc testing method and the frequency - resonance method were used to determine the stability of implants. For torc testing, a torque control key was used, which is a device with a special graduated scale for wrapping implants, suprastructures and additional accessories, allowing you to control the applied pressure. It is included in the basic set of surgical tools of MEGAGEN for dental implantation surgery. Torc test results using a dynamometer key were recorded during the operation of placing implants in the corresponding artificially created bone wells after their final tightening.

The stability of implants was monitored using the frequency-resonance method using the MEGA ISQ device from MEGAGEN (South Korea). The fourth-generation MEGA ISQ contactless device for frequency resonance analysis is small in size, battery-powered, and provides quick and simple measurements that can be interpreted directly from the patient's chair. The device consists of an instrument block with a

computer analyzer, an emitter-receiver of the electromagnetic field. The method is based on recording resonant electromagnetic vibrations of the implant and surrounding bone when exposed to an electromagnetic field. Stability is expressed in units of the implant stability Quotient (ISQ) on a scale from one to one hundred. Stability was measured using this device after the final placement of the implants with a dynamometer key. The test results according to this method were taken in the Medio-distal and vestibular - oral directions after placing a special rod on the implants.

75 AnyRidge implants and 70 AnyOne implants from MEGAGEN (South Korea) were subjected to stability studies. Measurements of implant stability were performed directly at the chair at the first surgical stage and after 3-4 months. Depending on the stability of the implants, operations were performed using a one-stage or two-stage surgical Protocol. The immediate loading tactic was chosen taking into account the high stability of the installed implants. According to the chosen tactic, implants with torc test values greater than 45 n/cm and a frequency - resonance coefficient greater than 65 units were subjected to immediate loading. As orthopedic structures for the period of the osteointegration process, provision fixed prostheses made of polymer materials were made. Only at the end of the period of osteointegration were they replaced with metal-ceramic crowns or bridges. Bearing in mind that the measurement of implant stability will be carried out after the onset of osteointegration, preference was given to the screw method of fixing fixed prostheses.

### **Results obtained and their discussion**

Of the 75 AnyRidge implants installed, 60 had torc test readings of more than 45 n / cm. torc test Scores of more than 45 n / cm among anyridge implants were noted in 36 of the 70 installed ones (see table. 1).

When checking the stability of 75 AnyRidge implants with the MEGA ISQ device, 62 of them showed a stability coefficient of more than 65 units, and 40 of the 70 anyridge implants with stability coefficient indicators of more than 65 units.

Table 1. The stability of implants

Methods testings	Indicators testing	Implants AnyRidge		in total	Implants		in total
		upper	lower		upper	lowe	
<b>Torc testing in n/cm</b>	<b>n/cm more</b>	<b>23</b>	<b>37</b>	<b>60</b>	<b>16</b>	<b>20</b>	<b>36</b>
	<b>less 45 n/cm</b>	<b>10</b>	<b>5</b>	<b>15</b>	<b>22</b>	<b>12</b>	<b>34</b>
		<b>33</b>	<b>42</b>	<b>75</b>	<b>38</b>	<b>32</b>	<b>70</b>
<b>Frequency-resonance</b>	<b>65 n/cm</b>	<b>22</b>	<b>40</b>	<b>62</b>	<b>15</b>	<b>25</b>	<b>40</b>
	<b>less 65 n/cm</b>	<b>10</b>	<b>3</b>	<b>13</b>	<b>20</b>	<b>10</b>	<b>30</b>
		<b>32</b>	<b>43</b>	<b>75</b>	<b>35</b>	<b>35</b>	<b>70</b>

All Installed AnyRidge and AnyOne implants with high torc testing and frequency-resonance control were subjected to immediate loading, and their number was 145. Treatment of the remaining patients whose implants had low stability indicators was performed according to a two-stage management Protocol. Implants placed on the lower jaw showed higher stability values. This appears to be due to the higher mineral density of the lower jaw bone than the upper jaw. AnyRidge implants showed higher stability results than anyone implants. In our opinion, this is due to a more improved design of the thread geometry and a special coating on the surface of the AnyRidge implant. It should be noted that all implants (145 pieces) with high stability indicators were successfully integrated and showed higher values of torc testing and frequency-resonance control when re-measured (after 3 -4 months) than when they were directly installed on the jaws.

### **Conclusions:**

Thus, based on the data obtained, it can be concluded that immediate loading of implants can be carried out in the presence of high indicators of the stability coefficient (more than 65 units) of implants obtained using the MEGA ISQ device and torc testing of more than 45 n / cm.

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