ISQ: What is it and how to use it in implant dentistry to improve clinical outcomes

Peter K. Moy[1]

The use of dental implants to replace missing teeth has become a routine treatment modality. With the acceptance of this form of treatment, patient demands have increased for sooner completion of their treatment and long-term predictability. The clinician must be able to meet the demands from their patients for quicker loading protocols and higher predictability.

The Osstell® Resonance Frequency Analyzer (RFA) unit is a device that measures a sound wave (resonance frequency) generated by the unit and sent through the implant body by way of a rod (Smart peg) [Figure 1] connected to the implant.[1] Depending on the magnitude and amplitude of the sound wave, the Osstell® assigns a number (Implant Stability Quotient or ISQ) [Figure 2] indicating how stable the implant is.

The advancements and improvements made to the Osstell® unit have made it possible for the clinician to determine the primary stability established at the time of implant placement by using the Osstell®.[2] Once the stability of an implant (ISQ) is measured this baseline reading along with obtaining additional and successive ISQ measurements will enable the clinician to determine how the process of Osseointegration is progressing.[3] This method of assessing implant stability can provide the clinician with information that can be used to assure their patient that the implant is ready to take prosthetic loading and more importantly, the implant will provide long-term support for a definitive prosthesis. [Figures 3 - 8] There are

Figure 1: Smart-peg attached to implant and the Osstell unit.

[1] *Peter K. Moy, DMD*
Professor, Department of Oral & Maxillofacial Surgery. Nobel Biocare Endowed Chair, Surgical Implant Dentistry, UCLA, School of Dentistry

Figure 2: ISQ reading of this implant with a value of 84 indicating a very stable implant.

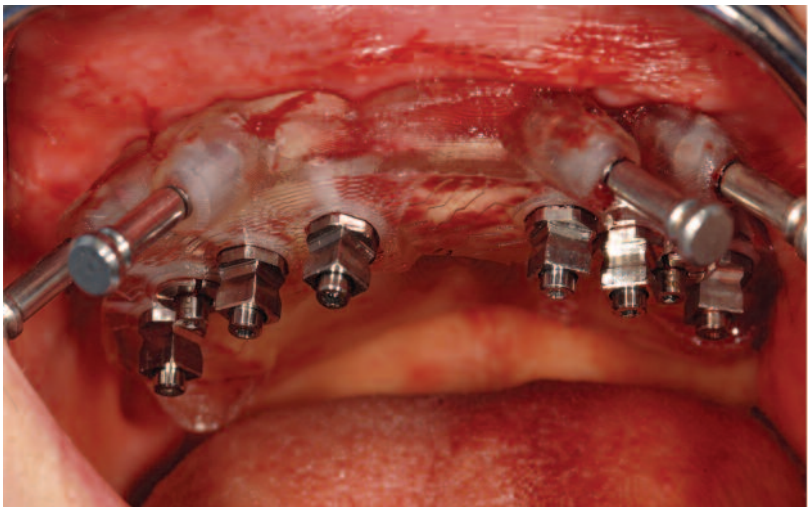
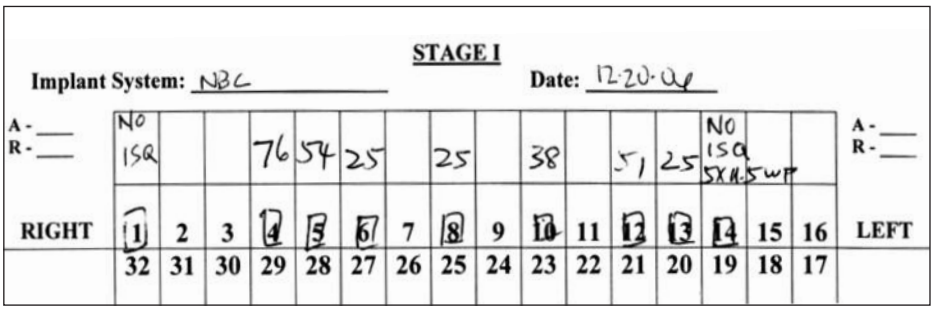


Figure 3: Implants placed using "guided surgical template" and flapless surgery (Nobel Biocare, Inc.).



STAGE I

Implant System: NBC Date: 12-20-04

A - ___ R - ___	NO ISQ			76	54	25		25		38		51	25	NO ISQ 5X11.5WP		A - ___ R - ___
RIGHT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	LEFT
	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	

Figure 4: Initial ISQ measurements on implants just placed indicating "initial stability". The posterior implants had sufficiently high ISQ values to permit immediate loading protocol. The lower ISQ values with anterior implants will be assisted by the splinting effect and cross-arch stabilization with a full fixed prosthesis.

several advantages to comparing successive ISQ measurements to a baseline recording. These advantages include permitting the clinician to predictably develop proper loading protocol for an implant that was placed,[4v] determine when an implant may take permanent loading or accept a definitive prosthesis[5], when an implant may be losing integration or in the process of failing.

The use of Osstell and obtaining ISQ measurements in

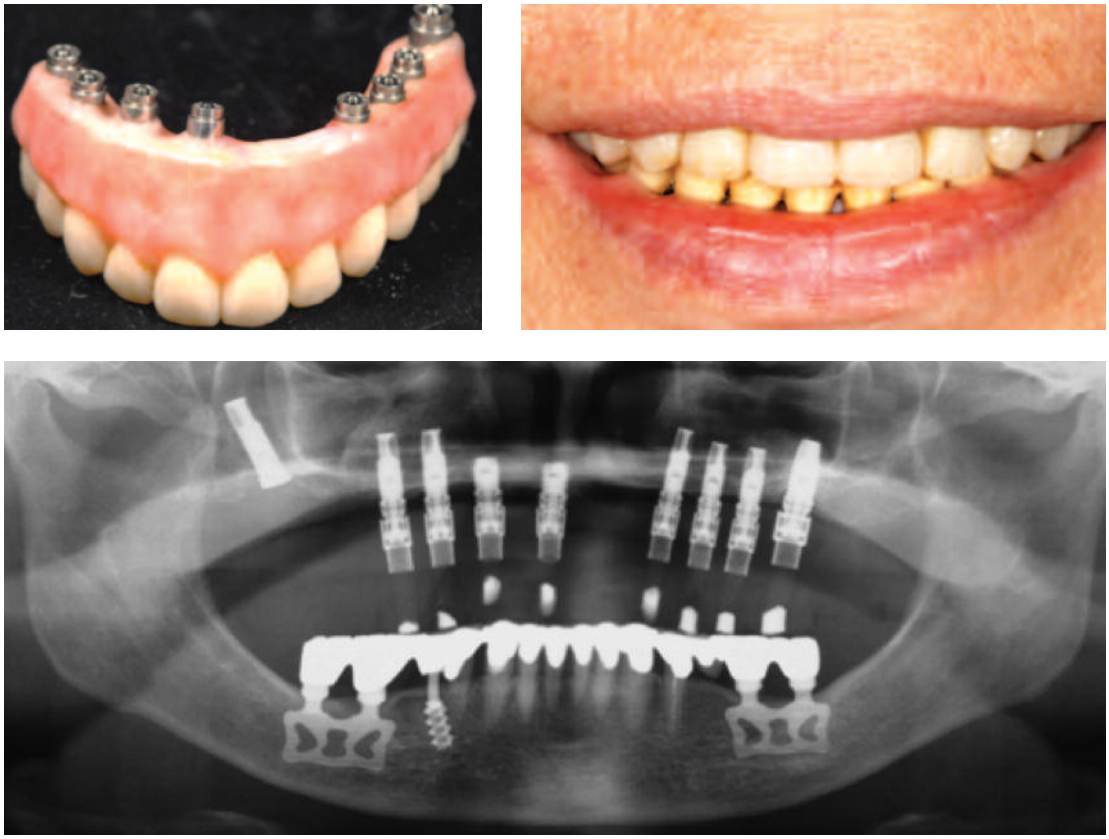


Figure 5: Decision made to immediately deliver a provisional fixed prosthesis based on the initial ISQ readings. The provisional prosthesis was fabricated prior to the guided surgical procedure. Clinical view of the prosthesis immediately after Stage I surgery. The panoramic x-ray showing the provisional prosthesis completely seated onto implants. (Note: the Pterygoid implant was placed to permit support of a distally extended definitive prosthesis but was not used to support the provisional prosthesis.)

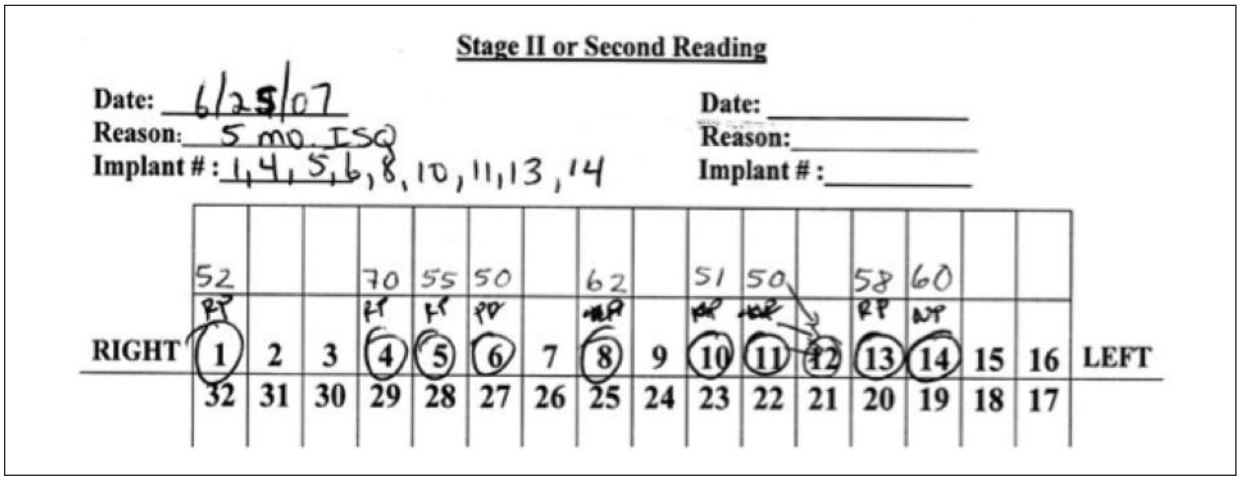


Figure 6: A second ISQ measurement taken of all implants at 5-months post insertion indicating all implants are in different phases of Osseointegration.

Implant Dentistry is well documented. There are well over two hundred articles published in refereed journals (www.osstell.com) that illustrates the science behind the Osstell®. This is one data-generating device that an Implant Dentist must have and use on a daily basis to ensure optimized clinical outcomes for their patients.

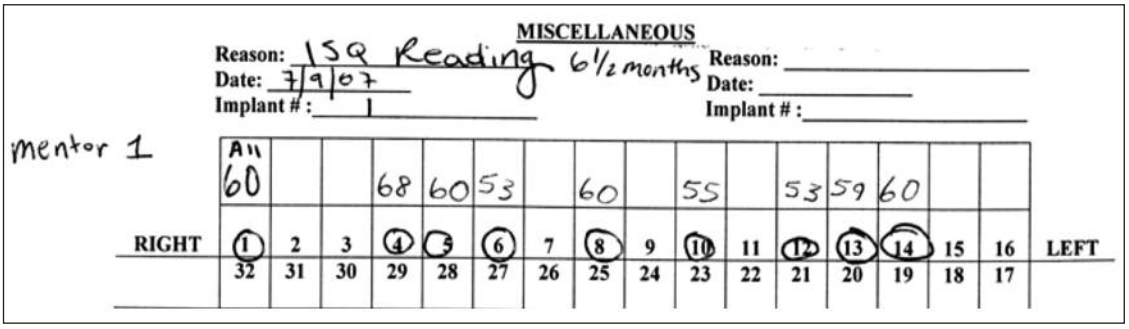


Figure 7: Third ISQ measurements indicating all implants have reached a steady state (note all readings were the same or higher than previous) and the definitive prosthesis should be delivered.

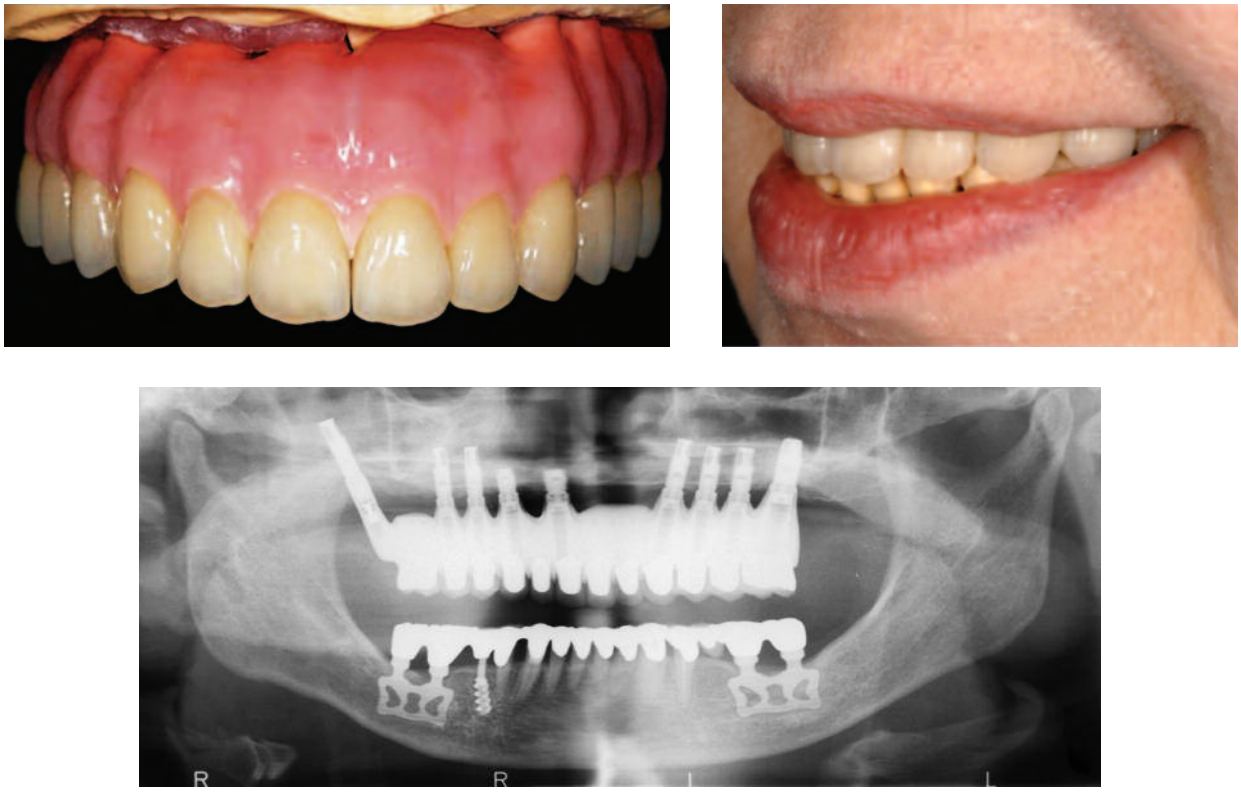


Figure 8: Definitive fixed prosthesis, radiographic confirmation that prosthesis is completely seated and clinical view.

References

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