

Table 3. The variation table of the ISQ value over time in patient 3.

PATIENT 3												
SITE	IMPLANT	ACCESS	T0			T1			T2			
			V	M	D/P	V	M	D/P	V	M	D/P	
1.5	4 X 11	30°	68	67	68	73	73	73	73	73	73	
1.2	3.5 X 13	10°	58	58	58	63	67	63	68	70	72	
2.2	3.5 X 13	20°	67	60	68	64	64	64	60	63	63	
2.5	3.5 X 13	10°	58	58	58	69	69	69	71	71	71	

Table 4. The variation table of the ISQ value over time in patient 4.

PATIENT 4												
SITE	IMPLANT	ACCESS	T0			T1			T2			
			V	M	D/P	V	M	D/P	V	M	D/P	
1.4	4 X 11	20°	69	69	69	70	70	70	64	74	73	
1.2	3.5 X 13	30°	63	68	68	69	69	69	68	75	75	
2.1	4 X 13	20°	70	70	70	70	70	70	72	72	72	
2.4	4 X 11	20°	64	68	66	56	51	57	53	53	53	

Table 5. The variation table of the ISQ value over time in patient 5.

PATIENT 5												
SITE	IMPLANT	ACCESS	T0			T1			T2			
			V	M	D/P	V	M	D/P	V	M	D/P	
1.5			66	66	70	71	71	70	75	75	74	
1.2			64	64	48	69	69	69	71	71	71	
2.2			70	70	70	70	70	70	72	72	72	
2.5			78	71	71	71	71	71	72	72	72	

ues at control t1 and t2 is neglected, the recorded ISQ values in the mandible are higher than those in the maxillary bone.

Twenty-four implants were osseointegrated whereas a maxillary implant was lost one month after immediate loading procedure (patient 2). A six months follow-up showed implant survival of 96%.

Discussion

The ISQ measurements performed at t0, t1 and t2 indicate that implant stability increases over time. This result can be due to both new bone formation around implant turns and bone mineralization increase in the bone-implant interface. Many studies monitored ISQ values shifts over time since implant placement (9-28). Three maxillary implants with ISQ values below 60 at t0 showed a marked increase in the ISQ value at t1 and t2. Huwiler et al.'s study states that the increase in ISQ value is higher in type IV bone and lower in type I bone 6 weeks after implant insertion (15). In Sim and Lung's 2010 paper, ISQ value of type II bone slightly decreases after 2 weeks but always remains above 70 ISQ, while ISQ value of type III and IV bone continuously grows until it reaches slightly lower values than those recorded in type II bone after 12 weeks (17).

In the present case, an anomalous trend was measured on three implants: their ISQ value progressively decreased, suggesting some kind of impairment; however, they remained clinically stable. Temporary prosthesis occlusal control revealed an occlusal overload on those three anomalous implants: the pre-contact was immediately corrected.

Further, the ISQ values measured on the three mandibular implants can be associated with a better bone quality of the implant insertion site (15, 17).

The different angulation Access® devices lead to an ISQ value average decrease if compared with the ISQ measured without intermediate components between SmartPeg™ and implant. The 0° Access® reports an average decrease of 1.74-5.01% of the ISQ value; the Access® 10° an average decrease of 5.07-6.63%; the Access® 20° a decrease average of 6.79-7.93%; the Access® 30° an average decrease of 7.2-8.73%.

Several Authors have searched for an ISQ threshold clinically useful to differentiate early successes and failures. Guler et al. state it is impossible to identify this value (12, 13). On the other hand, Andersson et al. affirm that a substantial ISQ value decrease recorded three month after surgery can predict implant failure. According to Fischer et al., an ISQ value lower than 44 indicates imminent failure in 100% of cases (29). Huwiler et al. report similar results: failed implants ISQ