Discussion

The classic two-stage Brånemark procedure, which was developed at the beginning of the 1960s, was the safest approach. This treatment modality was well documented in several long term studies (Adell et al 1981, Albrektsson et al 1986, Brånemark et al 1977) and considered the safest approach. During the last decade, trying to satisfy the increased demand of a more rapid treatment and to reduce the discomfort, during the healing period, the immediate loading protocol has been tested with many clinical trials. The immediate loading procedure has become a routine in the treatment of totally or partially edentulous patients and permits delivery of provisional fixed restorations the same day of the implant placement (Barzilay 1993, Gapski et al 2003, Glauser et al 2001a, Hahn 2000, Lorenzoni et al 2003, Misch et al 2004a, Misch et al 2004b). Several studies documented the success of this protocol when implants were placed in healed bony sites and even when they were immediately placed in fresh extraction sockets (Chen et al 2004, Schwartz-Arad and Chaushu 1997).

A number of factors may influence the results of immediate implant loading. These could be related to the surgical procedure, patient, implant design and occlusion-related factors. Surgical factors consist of primary implant stability and surgical technique. Patient factors comprise the quality and quantity of bone, wound healing, and systemic conditions. Implant factors include macro and micro-design, surface textures, and dimensions of the implant. Occlusal factors involve the quality and quantity of force and prosthetic design (Gapski et al 2003, Misch et al 2004a, Misch et al 2004b, Zahran 2007).

The high successful results (98.8%) of the present study illustrated that the new generation of OsteoCare™ Midi one-piece implants present the opportunity to provide patients with a minimally invasive, less costly, less complicated and less surgically intensive treatment. The successful results were achieved when the Midi implants were placed in both healed bony sites and fresh extraction sockets.

In this study, all the 84 Midi implants attained high initial stability over 30N/cm due to their conical design, buttress threads and roughened surface (grit-blasted and acid-etched). Furthermore, under-dimensioned drilling using only one profile drill together with the bone condensing property of the Midi implants increased initial stability.

It was reported that conical implant design in combination with the use of an undersized form drill could lead to higher initial stability than conventional implants (Barzilay 1993, O'Sullivan et al 2000, Sakoh et al 2006). Experimental and clinical studies have shown that the implant surface roughness and the thread design are major factors in achieving rapid and successful osseointegration which influence the procedure of immediate loading (Stanford, 2002).

	Patients	Age (range)	Age (mean)	Female	Male	No. of Implants
Healed bony sites	35	20-68	43	17	18	57
Extraction sites	13	38-72	55	8	5	27
Total	48	20-72	46	25	23	84

Table 1: Overview of clinical data of patients and number of implants included in the study

	ø3.3mm	3.3x13mm	3.3x16mm	ø3.8mm	3.8x13mm	3.8x16mm
Healed bony sites	9	7	2	48	40	8
Extraction sites	7	5	2	20	15	5

Table 2: Implant diameter ø (mm) and length (mm)

The flapless transmucosal procedure for placement of the Mini and Midi implants resulted in minimal swelling or pain and no occurrence of haematoma in the patients requiring minimal postoperative medication. It was reported that flapless surgery also admits a maintained better blood supply to the marginal bone, thus reducing the likelihood of bone resorption (Al-Ansari and Morris 1998, Becker et al 2005, Fortin et al 2006, Hahn 2000, Zahran 2007).

Although flapless implant placement is considered a blind surgical procedure, there is a learning curve with every surgical procedure, after which it becomes routine. There are many advantages for the patient as well as for the surgeon, since the procedure is less time consuming, bleeding is minimal, implant placement is expedited, and there is no need to place and remove sutures (Hahn 2000).

In this study, the immediately loaded provisional restorations were kept out of occlusal stresses to avoid high magnitude of forces and cycles. This conservative approach of reducing stresses resulted in an enhanced outcome. (Gapski et al 2003, Misch et al 2004a, Misch et al 2004b).

The one-piece implant design eliminates the need for placing healing collars and makes it possible to avoid manipulation of the soft tissue portion after initial healing. The implant-abutment junction in a two-piece implant design constitutes a structural weakness that may complicate the procedure (Hahn 2005). The results of this study showed that the Midi implants are indicated for both single and multiple tooth restorations, where immediate loading is possible in healed bony sites or for the immediate post-extraction approaches.

Conclusion

The new and innovative OsteoCare™ Midi one-piece (post type) implants provide excellent clinical performance with immediate loading in healed bony sites as well as in fresh extraction sockets. These implants have a number of distinct features that set them apart from their conventional counterparts. They allow for atraumatic flapless transmucosal placement, as well as same day delivery of single or multiple tooth provisional restorations.

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Area	Maxillary Anterior	Mandibular Anterior	Maxillary Premolar	Mandibular Premolar	Maxillary Molar	Mandibular Molar	Total
Healed bony sites	18	7	17	8	4	3	57
Extraction sites	6	16	2	3	-	-	27
Total	24	23	19	11	4	3	84

Table 3: Implant position

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