Reduced treatment complexity

Immediate function and esthetics

Clinical long-term success

High patient comfort
Hopeless dentition or edentulism is an irreversible condition and often the final marker of disease burden for oral health. There are considerable disparities in the prevalence of complete tooth loss in elderly between countries (Fig. 1). Sociodemographic factors (e.g. older age, lower education), chronic conditions (e.g. asthma), risk behavior such as smoking or an unhealthy diet and other health related variables have been associated with edentulism (Peltzer et al., 2014). Nowadays, improved oral prevention and treatment options are available, but the share of older people in the population is increasing due to higher life expectancy. According to the World Health Organization, about 2 billion people will be aged 60 and older by 2050 (World Health Organization, 2015). Therefore, it can be expected that the need for complete denture will increase as well (Douglass et al., 2002; Polzer et al., 2010). Patient’s awareness on the option of dental implant therapy is also increasing through growing access to multimedia. Additionally, a growing number of dental specialists will enter the field of implant dentistry (iData Research Inc., 2015). Straumann® Pro Arch is based on the treatment concept introduced by Paulo Malo (Malo et al., 2003b) and offers a safe, reliable and less complex treatment option for patients requiring full-arch treatments. Patients and clinicians benefit from the combination of the individualized prosthetics and the surgical advantages of the Straumann® SLActive® surface as well as the unique material properties of Roxolid®.

Fig. 1: Edentulism (%) in elderly in selected countries (Dye et al., 2012; Emami et al., 2013; Peltzer et al., 2014; Polzer et al., 2010).
REduced Treatment Complexity

The concept of Straumann® Pro Arch is a fixed rehabilitation which encompasses the whole procedure from removal of hopeless teeth, immediate placement of four implants and immediate loading of the implants with a temporary bridge. It also includes the treatment planning steps before surgery and afterwards when converting the temporary bridge to the final full-arch prosthesis. A recent literature review concluded that two posterior and two anterior implants are appropriate if their placement does not necessitate major bone grafting procedures (Mericske-Stern and Worni, 2014). However, missing teeth lead within short time to significant bone resorption which is especially challenging in the posterior region of the maxillary arch. In the past and with conventional implant treatment modalities, patients with bone loss had to undergo the lengthy procedure of bone augmentation. The full arch restoration with only four instead of 5–8 implants reduces the number of surgeries as bone grafting procedure is not performed and reduces therefore treatment complexity, which can result in cost savings of several thousand dollars per jaw for the patient (Babbush et al., 2014) and in saved chair time for the doctor. By tilting the distal implant, a more posterior position can be reached which reduces the distal cantilever of the prosthesis and avoids the need for bone grafting procedures (Malo et al., 2005). Another advantage is that longer implants can be placed without interfering with the mental foramina in the mandible or the need for sinus floor augmentation in severely resorbed maxilla. A standard implant length of at least 10 mm has been indicated (Malo et al., 2003a). To today’s knowledge, tilting of implants also provides a larger prosthetic base and reduces the force acting on the implants (Krekmanov et al., 2000). Therefore, the Straumann® Pro Arch treatment solution is less time-consuming and less costly in comparison with conventional implant treatment modalities of the edentulous and soon-to-be edentulous jaw.

DID You Know?

In a recent survey on oral health with more than 30,200 participants (Eurobarometer, 2010)

• 15% of people reported difficulties with eating food due to mouth and teeth problems
• 4% avoided conversation or reduced participation in social activities because of problems with their denture

Immediate Function and Esthetics

Primary stability is a prerequisite for immediate implant loading and warrants the rigidity and successful osseointegration of a full-arch fixed restoration (Branemark et al., 1977; Meredith, 1998). The Straumann® Pro Arch concept uses Straumann® Bone Level Tapered Roxolid® SLActive® Implants. Roxolid® is a unique metal alloy with biocompatibility and fatigue strength superior to titanium (Ikarashi Y et al., 2005). The tapered implant body
design allows preparing the site with tools one size smaller than the diameter of the implant, thus increasing primary stability. Protein and blood coagulation are influenced by implant surface properties, such as wettability and nanostructure. \textit{Straumann® SLActive®} is a chemically modified hydrophilic surface which is proven by clinical evidence to accelerate the osseous healing \cite{Buser2004, Lang2011, Oates2007, Schwarz2007}. \textit{Straumann® Roxolid®} Bone Level Tapered implants with the SLActive® surface speed up the process of new bone formation upon the implant and thus shorten the critical transition phase between primary and secondary stability. Based on this an immediate installation of the functional prosthesis is possible without compromising on predictability. This leads to faster comfort and gain of time as well as immediate esthetics for professionally and socially active patients.

\textbf{DID YOU KNOW?}

According to a study by the American Association of Orthodontics, the first thing people notice when they meet you is your smile. Surprisingly, eyes came second followed by weight and hair. The majority of the respondents said that they would consider a dental treatment until a very old age.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Fig_2}
\caption{Drivers of the dental implant market. Shorter procedures, utilizing only one stage or immediate loading, are becoming more popular because they reduce the period of time between implant and prosthetic installation. US data. Source: iData Research Inc.}
\end{figure}
CLINICAL LONG-TERM SUCCESS

A large cohort clinical study involving 245 patients and 980 implants installed in the edentulous mandible reported patient-related and implant-related success of 93.8% and 94.8%, respectively, after 10 years of follow-up (Malo et al., 2011). This resulted in a prosthesis survival rate of 99.2%. A retrospective study involving 242 patients and 968 implants in the completely edentulous maxilla reported a 5-year survival rate estimation of 93% and 98% at patient and implant level, respectively. The survival rate of the prosthesis was 100% (Malo et al., 2012). A recent clinical trial performed the technique also in diabetic patients and found no variation in success rate in comparison to non-diabetic patients. Thus, the reported survival and success rates compare favorably with other immediate/early loading protocols for the same indication and indicate that the immediate loading concept for the completely edentulous or soon-to-be edentulous patient using four implants is a viable long-term solution. Skepticism regarding higher stress in the bone from angled abutments or implants compared to straight counterparts could be disproved by stress studies. A study which analyzed stress patterns around distal angled implants found little difference in strain magnitude for implants placed at angles between 0–45° (Begg et al., 2009). Further analysis showed that two straight and two tilted implants with good anterior-posterior spread are at least equal to conventional concepts (Baggi et al., 2013; Bellini et al., 2009). Four to six implant fixed prosthesis yields an implant failure of 0.75%. Hence, it can be concluded that immediate loading performs at least equal as the conventional loading protocols of the past in edentulous mandibles (De et al., 2014).

HIGH PATIENT COMFORT

People with unrestored edentulism or cracked teeth often present with emotional and psychological problems such as behaving in a way that keeps the tooth loss secret, declining self-confidence and social isolation (Patil and Patil, 2009). The degree of suffering becomes clearer when looking at findings from a large German survey. People having fewer than 9 teeth reported more impact on health-related quality of life than people suffering from cancer (Mack et al., 2005). Osseointegrated dental implants allow for proper chewing and speaking, increases comfort, appearance and self-confidence, reduces bone resorption and usually improves patient’s nutritional status. Also facial appearance is greatly improved with compared to conventional complete dentures as the patient’s facial muscles are freed from the burden of having to stabilize dentures. Therefore, the Straumann® Pro Arch solution gives back quality of life to patients, already within a couple of hours of treatment.

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