

# Edentulous patients – an overview of different forms of treatment on CAMLOG® implants

Peters F, Wanner H.

Zahnlose Patienten – ein Überblick über verschiedene Versorgungsformen auf CAMLOG® Implantaten. Logo 2011;24:8-10

**SUMMARY: Several studies document the excellent treatment successes with CAMLOG® implants; studies up to 5 years of different retention methods and implant numbers.**

## Introduction

There are several implant-supported rehabilitation options for edentulism of the maxilla and mandible. Implant-supported overdentures with four interforaminal implants are normally recommended as the standard treatment of the mandible. The situation differs in the maxilla because of poor bone quality, i.e., additional implants are often placed in the lateral area for better stability. When treating edentulous patients with fixed restorations, a higher number of implants are used (six in the mandible, seven in the maxilla). The aim of this document is to provide an overview of current studies

## Selected studies

**Overdentures on CAMLOG® implants – scientifically well documented:** The treatment of edentulous patients with overdentures on CAMLOG® implants has scientifically been well documented. Various institutions have carried out prospective and retrospective clinical studies on implant-supported prostheses in the maxilla and mandible with different implant numbers (Table 1). Various bar constructions and retention methods have been studied and compared (Table 2). Table 3 provides an overview of the studies.

### Excellent implant survival rates and high patient satisfaction:

In all studies with CAMLOG® implants, excellent implant survival rates and treatment successes have been documented [1-13]. Implant survival rates and treatment successes in the studies were between 98 and 100% over a period of up to five years. These results correspond to the results of comparable studies with other established implant systems [14].

### Ball abutment vs. telescopic crown – a five-year prospective study:

In their study, Krennmair et al. (2011) examined patients with overdentures over a period of five years [1], that were retained in the atrophied mandible with ball or telescopic crown attachments [1]. Twenty-five patients with edentulous mandibles were each treated with two CAMLOG® implants in the interforaminal region of the cuspids. Either a ball abutment or elastic telescopic crowns were used, randomly. The success of the implantation, condition of the peri-implant tissue, possible necessary interventions to maintain the prosthetic and patient satisfaction were evaluated. The study showed that more interventions were required during the five years for ball abutments; technical complications with the ball abutments (61% of cases) occurred much more frequently than with the telescopic crowns (38%,  $p < 0.01$ ). Differences were

### Number of implants used

	2	4	>4
<b>Mandible</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Maxilla</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### Retention technique

	Milled bar	Round bar	Ball abutment	Telescopic crown	Galvano bar	Horizontally screwed fixation
<b>Mandible</b>	<input checked="" type="checkbox"/>					
<b>Maxilla</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**Table 1:** Overview of the studies on treatment forms on CAMLOG® implants in the maxilla and mandible of edentulous patients: number of implants used

**Table 2:** Overview of the studies on treatment forms on CAMLOG® implants in the maxilla and mandible of edentulous patients: retention technique

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particularly evident during the first three years ( $p < 0.05$ ) [1-3]. The condition of the peri-implant tissue and treatment satisfaction did not differ significantly. Implant treatment success in both groups was 100% during five years [1]. Karabuda et al. (2008) found similar results. They compared overdentures with bar and ball abutment on two to four implants in 26 patients [4]. The study encompassed various implant systems including CAMLOG® implants. The treatment success with both techniques was also comparable in this study.

**Milled bars vs. telescopic crown on four implants – three years of data:** A very high rate of implant treatment successes (100% over 3 years) were also observed in a randomized prospective study with 51 edentulous patients [5]. The patients have received a mandibular overdenture on

four CAMLOG® implants retained with milled bars or telescopic crowns. The study showed that peri-implant conditions were stable for both retention techniques. Prosthetic follow-ups were also comparable in both groups. Indeed, more plaque and tartar was observed with the bar constructions. However, the prosthetic treatment showed slight benefits with this technique. The authors concluded, that both retention methods are successful and that the clinician should choose the technique he/she is most familiar with [5].

**Different retention options on two or four implants:** Over a period of five years, Weinländer et al. (2010) also observed implant survival rates of 100% [6]. The study included 76 patients with edentulous mandibles. They received an overdenture on either two or four

## Prospective and retrospective studies

Authors	Maxilla / mandible	Duration / follow-up	Retention	Treatment on N implants	Implant survival rate	Retrospective / prospective
Krennmair et al. 2011 [1]	Mandible	5 years	Ball abutment, telescopic crown	2	100%	prospective
Krennmair et al. 2011 [5]	Mandible	3 years	Milled bar, telescopic crown	4	100%	prospective
Xiang et al. 2011, 2010 [9, 10]	Maxilla Mandible	5 years	Horizontally screwed fixation	6 to 9 5 to 8	99%	retrospective
Weinländer et al. 2010 [6]	Mandible	5 years	Milled bar, round bar	4 2 or 4	100%	prospective
Krennmair et al. 2008 [12, 13]	Maxilla	5 years	Milled bar (anterior vs. lateral region)	4 6 to 8	98%	retrospective
Krennmair et al. 2008 [7]	Mandible	5 years	Milled bar, round bar	4	100%	prospective
Karabuda et al. 2008 [4]	Maxilla Mandible	23 months	Ball abutment, round bar	2 to 4	99%	no statements
Krennmair et al. 2007 [8]	Mandible	59 months	Milled bar	4	99%	retrospective
Nelson et al. 2006 [11]	Maxilla Mandible	35 months	Galvano bar	5 to 6 4	99%	retrospective
Krennmair et al. 2006 [2, 3]	Mandible	3 years	Ball abutment, telescopic crown	2	100%	prospective

**Table 3:** Prospective and retrospective studies on treatment forms on CAMLOG® implants: retention technique, number of implants, study duration and jaw examined (in chronological order).

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implants. With two implants, a prefabricated round bar was used for retention, and with four implants, either several prefabricated bars were used or one milled bar. The retention methods had no impact on treatment successes and stability of the peri-implant tissue. Patient satisfaction was also comparable in all groups. However, prosthetic complications were less frequent for a milled bar on four implants ( $p < 0.01$ ).

Krennmair et al. (2008) also found similar results. In a randomized prospective study with 51 patients, they showed that a milled bar on four interforaminal CAMLOG® implants leads to fewer technical complications than the use of several round bars. Their implant survival rates were 100% over five years [7].

A retrospective study with 67 edentulous patients also confirms these results [8]. The patients received implant-supported overdentures on milled bars. Over a period of five years on average, the implant survival rates were 99%.

**High implant survival rates also for conditionally removable bridges:** Treatments in edentulous maxillas and mandibles with conditionally removable bridges on CAMLOG® implants were studied by a working group in Berlin [9, 10]. Forty patients were included in the retrospective study over five years. They received a total of 55 bridges on 353 implants. On average, seven implants were placed in the maxilla, six in the mandible. For retention, galvano elements were used, which, according to the authors, combine the benefits of screwed fixation and cementation. After an average observation period of slightly more than four years, there were cumulative implant survival rates of 99%. The implant-supported bridges with galvano elements proved clinically successful and could be reliably removed at the scheduled times. The use of an electroformed substructure allowed long-term retention, while the suprastructure could be removed again at any time, explain Xiang et al. [9, 10].

## High patient satisfaction and treatment successes of implant-supported prostheses in the maxilla and mandible:

In the years 1999 to 2005, Nelson et al. (2006) treated 119 edentulous patients with 150 implant-supported galvano bar prostheses on five to six implants in the maxilla and four in the mandible on average [11]. For the retrospective study 118 prostheses could be evaluated after an average period of 35 months. Only seven of 568 implants were lost, i.e., success rates of 99%. The prosthetic seats were stable in 93%, only 7% showed slight movements during unilateral loads. 85% experienced no mechanical complications. Patient satisfaction was 97%.

## Anterior extension bar or posterior bars?

In a retrospective study, Krennmair et al. (2008) compared overdentures in the maxilla on implants in the anterior region (four implants) and in the posterior regions (six implants after augmentation) [12, 13]. After 42.1 months on average, 34 patients with 179 implants were examined. The cumulative implant survival rates were 98%. There was no difference between the two treatment groups in that. The authors concluded that with good planning, both concepts allow high implant survival rates and excellent peri-implant conditions.

## Milled bars vs. telescopic crown on four implants – three years of data:

A very high rate of implant treatment successes (100% over 3 years) was also observed in a randomized prospective study with 51 edentulous patients [5]. The patients received mandibular overdentures on four CAMLOG® implants retained with milled bars or telescopic crowns. The study showed that peri-implant conditions were stable for both retention techniques. Prosthetic follow-ups were also comparable in both groups. Indeed, more plaque and tartar were observed with the bar constructions. However, the prosthetic treatment showed slight benefits with this technique. The authors concluded, that both retention methods are successful and that the clinician should choose the technique he/she is most familiar with [5].

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