ITI Funded Research – Meet the Researchers!

In this issue Forum Implantologicum talks to Prof. Dr. Asbjørn Jokstad about his ITI-funded study “Benchmarking outcomes in implant prosthodontics: Partial fixed dental prostheses and crowns supported by implants with a turned surface over 10 to 28 years at the University of Toronto”.

Research leads change and innovation and, through its Research Committee, the ITI contributes more than CHF 2 million annually to pushing back the boundaries of knowledge in implant dentistry.

Forum Implantologicum: How long have you been involved in research and where is your research team based?

Asbjørn Jokstad: After graduating in 1979, I worked full time in clinical practice for a few years before embarking on a prosthodontics graduate program, which I combined with university studies in informatics. The latter led to a job at the Department of Anatomy at the Faculty of Dentistry, University of Oslo, Norway. There I was approached by Professor Ivar A. Mjör, who at the time was our acting department head but on leave to establish the Nordic Institute for Dental Materials (NIOM), to assist him in developing a practice-based research network (PBRN) amongst dental clinicians in the five Nordic countries. As a newbie at the time, it was an awe-inspiring experience to deliberate with distinguished scientists such as Harold Stanley, Gunnar Ryge and Rafael Bowen along with the many other personal friends of Professor Mjör. Later I went back into private practice but remained in contact with the university through the Department of Oral Prosthetics and Stomatognathic Function and later secured a tenured position in 1998 as an associate professor in the Cariology Department, although I returned to prosthodontics as a full professor once a new position opened there in 2004. After only a few months the Faculty of Dentistry in Toronto, Canada invited me to apply for the head of prosthodontics position following the retirement of Professor George Zarb. Once in Toronto, it became apparent that the research focus for prosthodontics differed markedly between Oslo and Toronto. In Oslo, the emphasis was on the full spectrum of tooth-borne and implant-borne prosthodontics with a focus on ceramics and stomatognathic functions, while in Toronto everything revolved around dental implants and implant prosthetics. I spent the next eight years in Toronto, but following a one-year sabbatical in Tromsø, Norway, I recognized that a lifestyle in a breathtaking rural landscape in northern Norway was far more attractive than living in the crowded center of a multimillion city in Canada. Hence, since 2013 my primary affiliation is with The Arctic University of Norway, where my core research team is also located.

FI: How did your team choose this topic as your research focus and why did you pick this topic in particular?

AJ: Simply stated, our study was a replication study of a retrospective study conducted by colleagues at the University of Bern, Switzerland (Buser D., Janner S. F., Wittneben J. G., Brägger U., Ramseier C. A. & Salvi G. E. (2012) 10-year survival and success rates of 511 titanium implants with a sandblasted and acid-etched surface: A retrospective study in 303 partially edentulous patients. Clinical Implant Dentistry and Related Research 14: 839–851.) The pool of patients treated over many years in the graduate prosthodontics clinic in Toronto was extensive. One significant difference between the two institutions is that only implants made by Straumann were used in Bern, while only implants made by Nobel Biocare had been used in Toronto. We reasoned that if we adopted the same study protocol we could compare data regarding survival and success rates, complication characteristics, and the extent of maintenance across the two institutions. We are thankful that the investigators in Bern agreed, and they very kindly forwarded their original patient information letters, case report forms, patient questionnaires, and written evaluation criteria, which we translated from German into English.

FI: Why did you apply for research funds with the ITI?

AJ: After embarking on my new role as discipline head in 2005, it took some time to persuade colleagues and staff to convert from being firmly linked to one particular dental implant manufacturer and to adopt innovative clinical operating procedures. A very successful conference in May 2008 entitled "The Toronto Osseointegration Conference Revisited" (http://web.archive.org/web/*/http://torontoimplantconference.ca) marked the transfer. Unfortunately, research funding dried up after 2008 because of the acute financial crisis and remained very difficult. It was not until 2010 that I dared apply for ITI funds, encouraged by listening to Professor Urs Brägger lecture at the ITI World Symposium 2010 in Geneva in April (while assuming incorrectly that volcano fumes from Iceland couldn't possibly ruin anyone's flight home), and next when Professor Daniel Buser arrived in Toronto in May when he was on a lecture tour across Canada.

FI: For those readers who are not directly involved in research can you describe how your research project was planned and conducted?

AJ: Regardless of the design of a clinical study, there are elements that must always be considered and there may also be pitfalls. The gold standard for comparative clinical studies is the double-blind, randomized control trial (RCT) with adequate study power to minimize the potential risk of bias as compared to other study designs. Keywords are (patient) selection bias and attrition bias, (operator) performance bias and detection bias, and (author) reporting bias. As a retrospective study, our study design is open to a higher risk of the various biases. Because this study was an attempt to replicate an existing study as closely as possible, it was necessary to pay close attention to identifying patients with similar characteristics to those in Bern. Moreover, the operating procedures of our clinicians had to be calibrated to comply with those of the Swiss study, and we also had to record all primary and secondary outcomes on the translated case report forms using similar formats.

FI: How do you think your research findings will help clinicians?

AJ: The study revealed that the patient profiles differed somewhat as did the treat-

Prof. Dr. Asbjørn Jokstad works at UiT The Arctic University of Norway and is the former Head of Prosthodontics at the University of Toronto, Canada. His contributions to science focus on clinical research in restorative, prosthodontic and implant dentistry, and on evidence-based practice (www.jokstad.net).

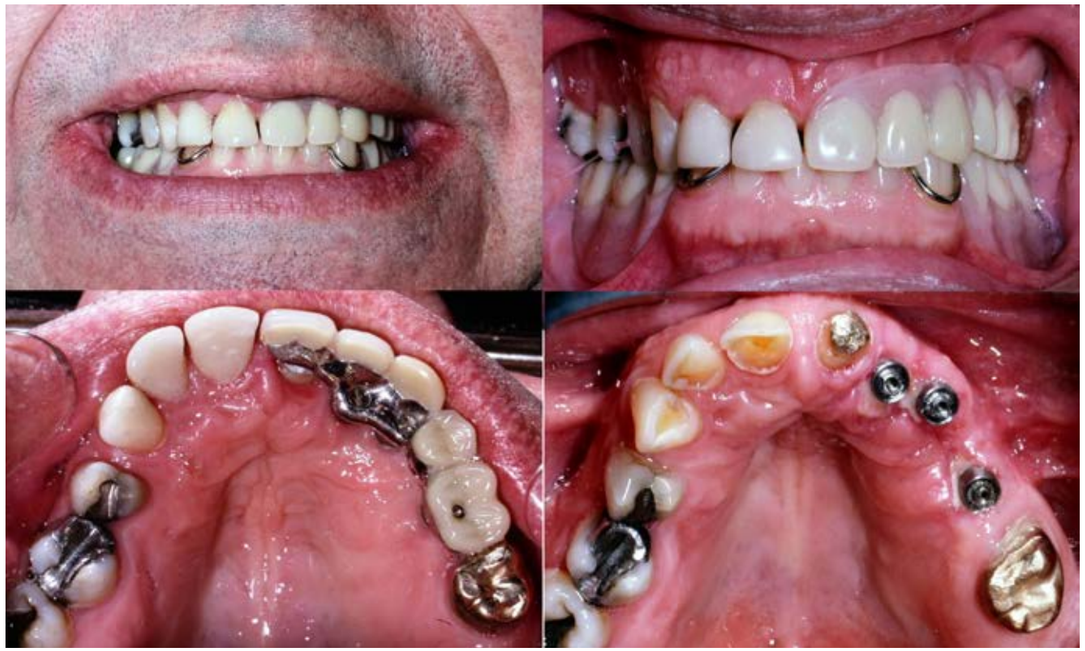

Fig. 1: A representative first-generation partial "Toronto-bridge". The photographs are from 1987. The bridge consists of a cast core of silver-palladium alloy, veneered with pink acrylic and prefabricated teeth. Up until 2002, only dental implants with an external hex and a machined surface were used. We aimed to appraise the clinical performance of these solutions by undertaking clinical examinations one to three decades later in combination with chart reviews

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ments they were offered. We also recognized that the recall routines were different. Nevertheless, we can say with confidence that the vast majority of dental implants remain in function for an extended period, supported by an implant success rate of 89% and a survival rate of 94% after an average of 17.5 years. Approximately half of the study participants experienced at least one defect in their superstructure, representing a 52% “success rate” while the survival rate was 70%.

FI: Are you planning to be involved in further research in this field, in particular on the long-term treatment effectiveness of this approach?

AJ: The patients in this study received machined dental implants with a smooth surface, while implants with a micro-rough surface dominate the market today. It would be of great interest to replicate this study once more, but this time focus on implants with an oxidized, i.e., micro-roughened, surface. It is by no means certain that these implants will perform as well as the sand-blasted and acid-etched surface implants in Bern and the machined implants.