Dental implants are inserted directly into the jawbone and used to hold prosthetic teeth in place. Dr Gunar Wagner at the University Hospital Leipzig, Germany, and co-workers are studying the benefits of a titanium one-piece dental implant system called FairOne™. They followed up five patients for almost ten years and showed that using FairOne™ implants offered an effective, affordable alternative to existing treatments for tooth implants.

Periodontitis (gum disease) is characterised by inflammation of the jaw which is damaging the tissues around the teeth. It is most commonly caused by an imbalance of bacteria in the oral cavity. In its early form, it is referred to as gingivitis, associated with bleeding of the gum. Without treatment, gingivitis can progress to periodontitis, which damages the underlying bone in the jaw and can lead to loosening of teeth and tooth loss. It is estimated that around 20-50% of the global population are affected by periodontal diseases, which can be controlled and managed with good oral hygiene, a healthy lifestyle, and regular dental check-ups. Treatment of periodontitis involves deep cleaning of the tooth surface, including the area below the gum (root surface).

Adjunctive treatment methods such as medications or, in severe cases, corrective surgery are possible.

Missing teeth can impact someone's ability to eat or speak, as well as having a significant impact on confidence and quality of life. Dental implants are replacement tooth roots – meaning they provide a foundation for fixed or removable replacement teeth such as crowns or dentures. Once the titanium screw is placed in the jawbone, the bone will gradually heal and fuse around the implant, holding it in place. Since implants don’t rely on neighbouring teeth for stabilisation, they are the closest match to a real tooth.

Most dental implants consist of two titanium pieces – the first anchors the implant in the jawbone and the second is made up of a joining piece (an abutment), to which the replacement tooth (the crown or denture) is connected.

One of the main goals of dental implantation is to preserve as much of the patient’s own soft tissue and bone as possible to promote good recovery and longevity of the implant. There can be complications associated with dental implants. In some cases, recesses can form around the implant, particularly if there are repeated changes of the implant and abutment connection. Further, there is a risk of infection (periimplantitis) at the abutment connection caused by a micro gap between the two titanium pieces.

Dr Gunar Wagner at the University Hospital Leipzig, Germany, and co-workers have reviewed an implant system that only uses one piece, called FairOne™. They aim to offer a product which is biologically effective and optimised for dental health, as well as one that is reliable and cost effective.

The technology
FairOne™ was launched by FairImplant GmbH, Bönningstedt, Germany, in 2006 and has several benefits that make it an attractive alternative to existing products. It is shaped to offer a high degree of stability when inserted into the jawbone, something which is particularly important if there are any weaknesses in the bone. Furthermore, the implant can be adjusted to compensate for differences in bone height along the jaw. It is also shaped so that there is no microgap between the crestal part and the soft tissue part, meaning less accumulation of bacteria. The implant has a special coating for immediate bone adhesion made up of calcium and phosphates – these minerals are required for strong bones and teeth and can accelerate healing. As FairOne™ is a one-piece implant, it can be inserted in one treatment, saving the patient time and money.

In addition to the implant itself, the company also developed a specific drilling and insertion protocol for FairOne™. This includes a special drill which corresponds to the unique tapered design of the implant, and which minimises damage to the surrounding bone. The dental team explain that implants usually start to become stable in the jawbone after around three to four weeks, as new bone forms around the implant, and this new product and drilling protocol are designed to facilitate this process as much as possible.

FairOne™ CASE STUDIES
Focusing on five patients, the dental practitioners showed that the implant was effective over a ten-year period. The first patient was a 60-year-old male, who had undergone previous treatment for periodontitis. One aspect that the team, consisting of dentists and researchers, explored was the amount of tissue that covered the tooth within the gum, the keratinised gingiva. Previous work has suggested that keratinised tissue may be required around implants.
to maintain dental and implant health. Cells that produce a protein called keratin are stronger that other cells, making the tissue around the base of the tooth stronger and harder – good properties when considering stability and protection for the implant. A FairOne™ implant was inserted and after 12 weeks, the surgical site had recovered well and the artificial tooth (crown) could be joined to the implant. The patient had regular check-up appointments and there were no concerns reported after nine years of follow up.

Next in the case series was a 23-year-old female patient with significant periodontitis and a decision was made to replace the tooth. At extraction, a FairOne™ implant was used to fit a prosthetic tooth. A digital system was used alongside, CAM-Analog by FairImplant GmbH, which means the implant, prosthetic, and patient’s teeth could be visualised on a computer before the replacement tooth was designed according to the patient’s key, as well as post-implant care, as lack of attached tissue around the implant can cause instability. They also highlight the lack of a micro gap between the implant and the abutment in a one-piece implant, which reduces the risk of bacteria being trapped and causing subsequent infection. A series of case studies show that the bone around the implant heals well and offers long term stability. After almost a decade, patients who had previously received FairOne™ titanium one-piece implants showed no increased loss of tissue around the implant or any infections associated with it. Wagner and co-workers conclude that further long-term clinical studies are needed to directly compare one- and two-piece implant systems to evaluate their effectiveness. Moving towards a one-piece system and personalised drilling protocol offers a promising alternative to existing treatments and has important implications for patients suffering from periodontitis or other dental conditions in the future.

The dental team conclude that FairOne™ offers a straightforward, high-quality option for single-tooth dental implants. Finally, the team explain that a one-piece titanium implant could also be used in routine clinical practice rather than specialist cases only. After fracturing her jaw, a 54-year-old female patient was given an implant immediately as part of treatment for the fracture. Eight years after the first implant, the patient received a second FairOne™ implant with no reported complications.

FUTURE VISIONS FOR DENTAL HEALTH

The dental team conclude that FairOne™ offers a straightforward, high-quality option for single-tooth dental implants. In contrast to previous studies, which have suggested lower success rates for one-piece implants. The correct positioning of the implant is key, as well as post-implant care, as lack of attached tissue around the implant can cause instability. They also highlight the lack of a micro gap between the implant and the abutment in a one-piece implant, which reduces the risk of bacteria being trapped and causing subsequent infection. A series of case studies show that the bone around the implant heals well and offers long term stability. After almost a decade, patients who had previously received FairOne™ titanium one-piece implants showed no increased loss of tissue around the implant or any infections associated with it. Wagner and co-workers conclude that further long-term clinical studies are needed to directly compare one- and two-piece implant systems to evaluate their effectiveness. Moving towards a one-piece system and personalised drilling protocol offers a promising alternative to existing treatments and has important implications for patients suffering from periodontitis or other dental conditions in the future.