**“Dentists need to be proactive in seeking to understand why bone is being lost”**

An interview with EAO speaker Dr Tomas Albrektsson, Sweden

**Today International:** Prof. Albrektsson, more than 50 years ago, Prof. Per-Ingvar Brånemark discovered the process of osseointegration, providing the basis for implant dentistry. Since then, the concept has gained acceptance and much research has been done on osseointegration and the underlying mechanism. **What are the latest insights?**

Prof. Tomas Albrektsson:

During the first few decades, osseointegration was perceived as a natural tissue response to commercially pure titanium implants. The incorporation of these implants into bone was interpreted as a simple wound-healing phenomenon. However, this explanation has been disproved by further research. Today, we view osseointegration as a foreign-body reaction to protect the body from something potentially harmful, such as titanium or ceramic implants.

**In your research, you emphasise that understanding the biological basis of osseointegration and the role of bone biology and the immunological aspects is important in order to improve the outcome of implant treatment. How far has research come in this field and what is there still to learn?**

We certainly need more research. Having said this, many scientific papers researching the induction of a foreign-body reaction in the form of ligatures placed around implants have presented data on the vicious combination of two foreign bodies—the implant and the ligature. In clinical research, another such combination of foreign bodies was observed, namely when cement particles accidentally enter the soft tissue around the implant. One may say that a successfully placed implant is in a delicate state of balance, described as a foreign-body equilibrium. If another foreign body or certain patient characteristics, such as smoking, genetics or the intake of medication, like antidepressants, are present, the equilibrium may be disturbed and bone resorption may ensue. Moreover, factors such as implant design, leakage (particle wear), excessive force or broken components may exacerbate the situation and result in osteolytic reactions due to immune system activation.

The condition of peri-implantitis has been much debated in recent years and there is still no consensus on whether it should be classified as a disease or a complication of placing a foreign body in the oral cavity. What is the main issue in this regard and what is your opinion on the matter?

In my opinion, peri-implantitis may be a man-made disease based on an assumed, but false, similarity between teeth and implants. Bone around implants may be lost through an aseptic reaction; macrophages will influence the delicate balance between the bone-forming osteoblasts and the bone-resorbing osteoclasts, in favour of the latter. Osteoblasts and osteoclasts are bone cells, as well as cells belonging to the immune system.

However, problematic implants that lose interfacial bone exist—even if in much smaller numbers than hypothesized in the past. Provided that the treating clinicians are well trained and use properly documented implant systems, the actual incidence of implant-compromising marginal bone loss may be in the vicinity of 1–2 per cent of all placed implants if followed up for ten years or longer. Therefore, it is not at all surprising that a recent study reported that more than 95 per cent of the allegedly infected implants in another study survived for an average of nine years of follow-up and that more than 90 per cent of the allegedly infected implants displayed no further marginal bone loss, but remained in a stable state with respect to further bone resorption.

**How can the latest discoveries in bone biology and osseointegration help implantologists in their clinical practice, particularly concerning the treatment of peri-implant bone loss?**

At present, we do not have an effective means of treating all cases of implant-compromising marginal bone loss. Even if immunological problems, in combination with various adverse factors, account for marginal bone loss, bacteria may exacerbate the situation over time. For this reason, antibiotics should be used. We do not know the role bacteria play in this context. Do they only represent a secondary opportunistic colonisation? Do they activate bone-resorbing cells similar to those previously active during aseptic loosening? Do they, together with biofilms, constitute further induction of a foreign-body reaction, resulting in further bone loss? Moreover, dentists need to be proactive in seeking to understand why bone is being lost. Could cement particles have caused the problem? Have implant components fractured? Having said this, previous incorrect alarmist reports have led to overtreatment in many cases. Sometimes, it may be sufficient to mainly follow the implants up carefully with frequent patient follow-ups to determine whether the condition will actually worsen or whether a new stable state with respect to no further bone loss will ensue.

Prof. Tomas Albrektsson will be presenting a paper titled “What is osseointegration in 2016 and why are we losing bone around dental implants?” on Friday, 30 September, from 13:30 to 15:00, in the Amphithéâtre Bleu at the Palais des Congrès de Paris.